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Stablecoins:
Business Model, Systemic Risks and Policy Perspectives

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Abstract

The view that cryptocurrencies can be a substitute for fiat currencies in an interconnected and digitised world appears to be gaining some traction. Such views are reinforced by the high fee banks charge on cross-border money transfers and for certain other financial services. The belief that cryptocurrencies will define the future of money is entrenched among millennials, and this belief has been driving up the demand for cryptocurrencies. Stablecoins in this ecosystem has taken on the role of the unit of account for crypto assets and is instrumental in providing liquidity as well as in facilitating trading of crypto assets. To play this role, stablecoins are being extensively used as collateral in crypto transactions with trading platforms holding such collateral in omnibus accounts. The global regulatory community is taking note of this and has expressed concerns that as the market for stablecoins and cryptocurrencies grow, potential risks to the broader financial system from runs on stablecoins can be damaging. This paper reviews these developments and provides some suggestions for policy drawing on the regulatory debates and initiatives from standard setters to address the risks identified.

Keywords: Central banks, collateral, cryptocurrencies, financial stability, regulation, stablecoins.

JEL Classification Numbers: E42, E58, G21, G23, G28.

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1. Introduction

The architecture of the current monetary system is anchored to a government issued fiat currency, and any payment instrument in this system is linked to a fixed amount of this anchor. But technological advances have now opened the door to a shift away from this conventional account-based monetary system. The digitalisation of money facilitates instantaneous peer-to-peer transfers in ways that were previously not possible. For example, digital tokens can be transferred among participants in a decentralised network within a given ecosystem.[1] The use of mobile apps and digital payments has become more entrenched in the daily lives of citizens. As newer forms of private money proliferate, central banks themselves feel compelled to enter the race to offer a digital version of the cash in circulation to support the government backed fiat currency as the anchor of the monetary system.

Brunnermeier et al (2019) argue how the ongoing digital revolution may lead to a radical departure from the traditional model of monetary exchange. On the one hand, innovations in digital currencies can include features that unbundle the functions served by money (store of value, medium of exchange and unit of account) and render competition among different forms of private currencies fiercer. On the other hand, digital currencies associated with large platform ecosystems can lead to a re-bundling of money in which payment services are packaged with an array of data services that encourage differentiation but discourage interoperability between platforms. These innovations are putting the traditional bank-based money creation and credit intermediation functions under pressure and potentially even under existential threat.

Other developments such as decentralised finance (DeFi), which is a new ecosystem for the provision of crypto services, have the lofty goal of democratising finance by replacing legacy centralised institutions with peer-to-peer relationships that can provide a full spectrum of financial services. It consists of financial protocols – implemented as “smart contracts” – that run on a network of computers to automatically manage financial transactions without requiring banks or other centralised intermediaries. But DeFi does not come with any safety net as it lacks protection from criminal conduct or investor fraud, and erroneous transactions cannot be undone.

Stablecoins, the focus of this paper, play an important role in the DeFi ecosystem by serving as the medium of exchange in a wide range of activities (BIS, 2023). First, they provide liquidity to the DeFi ecosystem by allowing users to move in and out of the decentralised applications. Second, they serve as trading pairs for other crypto assets in decentralised exchanges – much like the US dollar in foreign exchange transactions between different currencies – thereby allowing users to trade crypto assets without having to convert them back to fiat currency. Third, stablecoins are widely used on DeFi lending and borrowing platforms where users borrow and lend stablecoins against collateral in the form of other crypto assets.

Stablecoins, as the name suggests, are designed to maintain a stable value relative to a national currency or another reference asset. When the stable value is maintained through algorithms that regulate the supply of the stablecoins based on market demand, they are called algorithmic stablecoins. Stablecoins are created in exchange for fiat currency that an issuer receives from a user or third-party. Stablecoin arrangements typically facilitate the transfer of

[1] The crypto ecosystem is a network of digital platforms and technologies that enable users to transact with crypto assets. It is based on blockchain technology that creates a secure, decentralised way to store and exchange digital assets. The crypto ecosystem provides access to a wide range of services without relying on centralised institutions.

coins between users by having issuers and other participants record the transfer either on the books of the digital wallet provider (for transactions between users of the same wallet provider) or on the distributed ledger (for transactions involving users of different wallets). Stablecoins allow market participants to engage in speculative digital asset trading and to move easily between digital assets of DeFi platforms avoiding the need for fiat currencies and financial institutions. DeFi activities tend to be largely confined to exchanging one stablecoin or cryptocurrency for another, but they do not finance activity in the real economy.

The global crypto-asset markets, which includes stablecoins, have grown substantially in scale and scope in recent years reaching a peak market capitalisation of $3 trillion in November 2021 (FSOC, 2022). This has attracted the participation of many entities, including banks, that now offer a wide range of financial services to crypto firms. While the crypto asset markets are quite small in size relative to global financial markets – roughly about 1 percent share – the inherently greater volatility of these markets and the growing linkages to the traditional financial market players are a cause for concern among regulatory authorities. Recent evidence also suggests that rising crypto asset prices are followed by significantly higher adoption of crypto trading apps as new participants are lured to the prospect of making quick and substantial profits (Auer et al, 2023). In view of these developments, regulatory authorities remain concerned that crypto assets if left to develop without proper regulation and oversight, might pose risks not only to its own safety and stability, but to the traditional financial system as well (PWG, 2021; FSB, 2022; BIS, 2023).

Against this backdrop, this paper tries to provide insights on the risks from stablecoins and highlight the key channels through which such risks can propagate, and then offers some policy perspectives to address them. The paper is organised as follows. To understand the risks as well as the channels for risk propagation from a broader adoption of stablecoins requires one to get a sense of the terminology and legal rights that underpin the crypto asset ecosystem. Section 2 of the paper deals with this. Section 3 of the paper discusses the underlying economics that provides the motivation for issuing stablecoins. Section 4 analyses the potential risks that stablecoins can pose to the financial system drawing on lessons from the global financial crisis. The views and initiatives of regulatory authorities on how to address the risks, including potentially contemplating stablecoin issuers to be subject to similar regulatory requirements as deposit-taking institutions, are discussed in Section 5. Drawing on the views of the global regulatory community, Section 6 discusses the policy options that central banks may pursue to address the risks posed by stablecoins. Summary and conclusions are given in Section 7.

2. Crypto terms, design issues and legal rights

This section introduces the terms used in the context of newer forms of money that rely on different types of database architectures to store information. They employ methods from cryptography that make the ownership of assets in this ecosystem non-transparent and anonymous. Making the ownership of crypto-assets opaque, anonymous and difficult to monitor is attractive for certain segments of the investor community, and these holdings and transactions are currently not captured under the regulatory perimeter. But this also creates problems in making legal claims and seeking investor protection if the stablecoin issuer commits fraud or implements poor cybersecurity measures that result in the loss of tokens or values stored in the digital wallet.[2]

[2] Digital tokens are units designated by entries in a digital ledger that uses cryptographic techniques. The term digital token is a metaphor of what tokens are in the physical world but has no physical representation.

Most of us are reasonably familiar with the technology banks employ to record the balances we hold in our demand and savings deposit accounts as well as in keeping a record of the in-coming and out-going transactions. These records are maintained in a centralised database, and the access rights to altering the values in the accounts are controlled by banks. The accounts we maintain in banks are associated with our name and other documentary evidence we provide to establish our identity. This information associated with our accounts provides proof of ownership and will allow us or our surviving spouse and children to make a legal claim against the bank for the amount due.

The claims we have on the newer forms of money, and in particular stablecoins that is the subject of this paper, are not based on the identity of ownership we are familiar with in an account-based monetary system. Rather, they employ methods from cryptography and store the claims to our ownership in a distributed ledger in a tokenised form with identity established through a private key. Many technical terms are linked to this sentence which are explained below.

Cryptography is the process of hiding or coding information so that only the person to whom the message was intended can read it. That message is referred to as being encrypted and the process of the conversion from plain text to incomprehensible text is referred to as encryption. Decryption is the reverse process. Because the newer forms of money use cryptographic techniques, they are referred to as cryptocurrencies. Most cryptocurrency wallets employ public key cryptography. The public key encrypts transactions, which can be decrypted only by the corresponding private key. The public key is used to send cryptocurrency into a wallet and can be thought of as the bank account number, which can be shared with others to receive money. The private key on the other hand is for the wallet owner only and it functions as a password to the crypto wallet that should be kept secret. In general, private keys to a wallet are numerical codes but to make it user-friendly, many wallet providers often encode the private key in a way that can be more easily recorded and remembered.

The information associated with the ownership and value of the stablecoins held in the wallet are stored in a distributed ledger – a ledger is simply a database. Unlike a centralised ledger that has a central point of control with one single entity in charge of the ledger, a distributed ledger is a database that is held and updated by each participant (or node) in a large network. A nuance to this is permissioned distributed ledgers, where each node in the network will have to first get permission from a central entity before connecting to the network and making changes to the ledger. Stablecoins reside on permissioned distributed ledgers.

Stablecoins are essentially ERC-20 (Ethereum Request for Comment 20) tokens that are fungible. That is, they operate on Ethereum blockchain through a smart contract based on the ERC-20 standard, and the tokens can be split into smaller units and exchanged for other tokens. A blockchain is a decentralised immutable digital ledger that stores transactions. It is made up of blocks that store their current hash value, previous hash value and will further store the hash of the next block.[3] When a transaction is made – it cannot be changed or tampered with. The reason it cannot be tampered with is that every single transaction hash is connected to the previous one. A smart contract refers to self-executing contracts written into code to be triggered when some pre-defined conditions are met. The tokens and transactions stored in the distributed ledger are connected to addresses instead of the name of persons or entities. The address is a shortened form of the public key mentioned earlier.

[3] The input data of arbitrary size that is transformed into a result of fixed size using a cryptographic hash function is called the hash value of the input.

The ERC-20 standard is responsible for the interoperability of various fungible tokens on Ethereum and other blockchains. The standard defines that a token must have certain values defined such as name, ticker, and number of decimals. It must also implement certain functions, such as checking the balance of tokens in a particular address and allowing the owner of the token to transfer it to another address. It is important to emphasise here that tokens associated with stablecoins are different from units in an electronic registry. For example, it is possible to have a digital registry in which units are recorded. But those registries are typically managed by an authorised entity and the units in the registries are not connected with rights or assets through smart contracts.

Turning to the legal rights of the owner of stablecoins, there are several issues to be considered (see Garrido, 2023). First, as tokens do not have any physical reality, there is no incorporation (fundamental principles for the law of commercial instruments that include among others, legitimation, transferability and autonomy). This creates uncertainty about the regime applicable to the transfer and creation of rights over tokens. For example, the person who has the private key controls the token and is entitled to exercise the right. But because there is no legitimation, there is no legal rule stating that the person with the private key is the legitimate holder of the right. Second, the role of private key in the transfer of tokens also raises some legal challenges. For example, to be able to exercise control over a token, a holder needs a private key. But this does not mean that the key is identified with ownership of the tokens – the private key gives the holder control but not ownership of the tokens. This then raises the question whether transferring the private key is a valid way of transferring ownership of tokens.

The traditional means for the creation and perfection of security interests include transfer of possession or registration. Possessory security interests such as pledges require transfer of possession, but this is not applicable to tokens. Non-possessory security interests are based on registration. However, records of values stored in a distributed ledger, such as tokens, do not have the same legal significance as registration of a security interest in a registry. These restrictions make it difficult to use stablecoins as collateral in financial transactions. In particular, it is unclear how the rules on general intangibles operate with tokens, as these rules assume the validity of a generic security interest, the possibility of selling collateral in the ordinary course of business and the continuity of the security interest over the proceeds. Consequently, the regime of secured transactions over movable assets or intangible assets is not suitable to deal with tokens.

Following the insolvency of several operators in the crypto asset ecosystem in 2022, it became clear that the nature of rights of token holders under insolvency proceedings of the intermediary or issuer is not well-defined. For example, in the bankruptcy case of the crypto firm Celsius, the US Court concluded that ownership of the tokens held had passed to the firm and therefore the tokens are part of the insolvency estate – a conclusion based on the specific language used in the contracts.[4] That has set a precedent for determining the ownership rights of tokens in future bankruptcy cases involving crypto firms. Finally, the jurisdiction where the disputes to the rights over the tokens or stablecoins held will be settled is unclear. Because tokens are not located physically anywhere, the rule “where the property is situated” criterion is not useful. An alternative possibility is to use the place where the ledger is located, but frequently the ledger is not located anywhere, particularly in cases of fully decentralised ledgers. People holding stablecoins and using them in collateralised trades should be mindful of these challenges.

[4] See Judge Glenn’s decision of January 4, 2023. https://www.axios.com/2023/01/04/celsius-bankruptcy-earn-accounts.

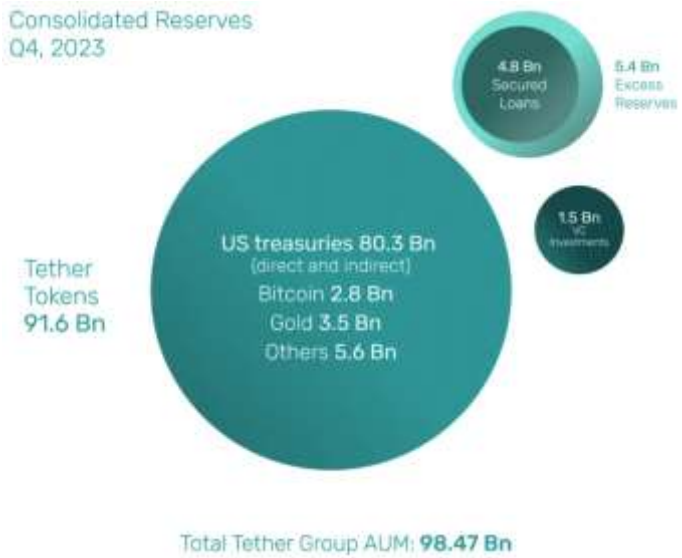
3. Underlying economics

Stablecoins are cryptocurrencies that are designed to maintain a stable value relative to a national currency or other reference asset. Acquiring stablecoins worth $100 that is pegged to the US dollar requires that the investor exchanges the fiat currency also worth $100 for stablecoins, which are pegged one-to-one to the US dollar. Redemption of the stablecoins will give the right to receive $100 in fiat currency. Unlike money held in a savings account, the stablecoins held in a crypto wallet does not receive any interest income.

As noted earlier, stablecoins are not being used for financing real economic activity. That is, the stablecoin issuer is not using the fiat currency received in exchange for the stablecoin to lend to finance the real economy. This is in stark contrast to banks, which use the money deposited in customer accounts to lend to businesses for investment projects or to provide mortgage loans to individuals. The net interest margin – the difference between lending and borrowing rates – that banks earn on the deposits provides justification for the bank business model. It is natural to ask the question what the business model for stablecoin issuers is. With more than a hundred different stablecoins being traded on DeFi platforms, it is hard to believe that all the stablecoin issuers have the philanthropic goal of making financial services cheap, democratic and inclusive. If we take this view, it is natural to ask the question how they make money from the stablecoins they hold in wallets to sustain their business model and generate revenue. This section provides some insights into the underlying economics.

To understand the revenue model, we will have to examine the balance sheet holdings and the net returns on the holdings of some stablecoin issuers. The total market capitalisation of stablecoins traded in March 2024 amounted to around $146 billion, representing about 5.8 percent of the total cryptocurrency market. Based the information published by CoinBase, the daily trading volume in the same period amounted to around $200 billion. The largest stablecoin issuer is USDT (US dollar Tether) with a market capitalisation of $103 billion in March 2024. Given the size of its balance sheet, Tether will be a representative candidate to understand the business model of stablecoin issuers and how they generate their revenue. Figure 1 shows the asset holdings of Tether from the consolidated reserves report as of 31 December 2023 (Tether, 2024).

Figure 1
Asset holdings of Tether, as of 31 December 2023



Source: Tether.

For the year 2023 Tether reported a net profit of $6.2 billion of which about $4 billion was generated through the holdings of US Treasuries, either through direct holdings or from indirect holdings through investments in money market funds (MMFs) or reverse repos. With the total exposure to US Treasury holdings amounting to $80.3 billion, this suggests that Tether generated a net return of 5 percent on these holdings. This is simply the return one would make by holding short-term US Treasury bills in 2023. One can infer from this that investors holding the USDT stablecoins are not being remunerated, and it is like keeping money in the current account of a bank paying no interest.

What is the use case for an investor to hold the money in stablecoins rather than in MMFs that pay at least the Federal funds rate? This really becomes the question for stablecoin issuers as it is in their interest to make investments in stablecoins attractive. Coming up with an answer to this question then becomes the key driver of their business strategy. Leveraging on the price stability of stablecoins to the pegged fiat currency, the business plan that stablecoin issuers have come up with is to engineer stablecoins to be the unit of account for quoting and trading other crypto assets on DeFi platforms. As stablecoins represent less than 6 percent of the cryptocurrency market, there is an excess demand for stablecoins compared to its supply to play this unit of account role.

This creates an opportunity for the wallet providers to meet the demand by encouraging investors in stablecoins to lend them at attractive interest rates. Stablecoin lending is done on crypto exchanges and is facilitated by crypto users who want to earn a passive income on their holdings. This lending is done on various platforms that include both DeFi exchanges and centralised finance (CeFi) exchanges. In the CeFi model, custody of assets is held by a central exchange that is executing the transactions. As part of the asset management, the CeFi exchange holds the private keys for cryptocurrency wallets that enable access to stablecoin tokens on a blockchain. CeFi is the cryptocurrency market equivalent of how traditional stock brokerages and investment firms handle fiat currency and equity trading in public stock markets.

Many users prefer CeFi to DeFi lending platforms because they are more user-friendly. To lend stablecoins on a CeFi platform (such as Nexo or Gemini), one has to transfer them to the exchange which takes temporary custody of the tokens. That entails risks as under bankruptcy of the exchange, the tokens transferred will be difficult to recover. DeFi, on the other hand, is peer-to-peer lending, but to lend on the DeFi platform a higher level of technical skills is required, including the ability to manage the smart contract code for lending.

The process to lend stablecoins and earn an interest income works as follows. After completing the know-your-customer (KYC) forms, investors first will have to transfer their stablecoins into the crypto wallet on their preferred lending platform and then move the stablecoins into the interest account of the wallet provider. Several crypto platforms have a lock-up period for the interest account, and the stablecoins are typically held in omnibus custodial wallets, perhaps also co-mingled with the crypto platform’s own stablecoin holdings. By agreeing to lend their stablecoins, which is most likely to be used by participants in the crypto asset markets to fund leveraged positions, investors in stablecoins receive returns higher than what MMFs offer. That makes the lending of stablecoins attractive.

These returns can vary across different types of stablecoins, but the annualised interest rates can be two percentage points or more over those MMFs typically offer. That would make stablecoins an attractive investment, and this rate of return will be intermediated by the lending platforms. This completes the circle – it provides the use case for stablecoin investors and supports the business model of stablecoin issuers. The business model involves borrowing money at zero interest rates by offering stablecoins as collateral and then investing the

proceeds in US Treasuries and other assets to earn the seigniorage. This model has some parallels with a central bank. Instead of printing cash to earn the seigniorage as central banks do, issuers print stablecoins.[5]

4. Risk propagation channels

Stablecoins are predominantly used to facilitate trading and lending on digital asset trading platforms and in taking leveraged positions in other cryptocurrencies by serving as collateral. They also play a central role in automated market maker arrangements to support liquidity for trades in other crypto assets. Given their role as facilitator of market liquidity in the cryptocurrency ecosystem, dislocations or sudden lack of trust in the market for stablecoins can have detrimental consequences for trading in crypto markets. This section begins with a general discussion of the risks from stablecoins, including those in the broader crypto asset markets, which have been highlighted by regulatory authorities. By drawing on some lessons learned from the global financial crisis (GFC), it then examines certain sources of risks that have the potential to amplify and take on a more systemic risk dimension.

The risks that are often cited about cryptocurrencies include fraud, misappropriation and misleading disclosures to the investor. Of the over 24,000 cryptocurrencies listed on CoinGecko since 2014, more than 14,000 have been shut down. Cryptocurrencies pose risks to financial integrity, including concerns related to compliance with rules governing anti-money laundering (AML) and countering the financing of terrorism (CFT). They can also facilitate the transfer of large amounts of money across the borders making capital controls difficult to monitor and implement. Focusing specifically on stablecoins, the promise to redeem stablecoins one-to-one against the reference asset in times of stress has not been fully tested, despite the turmoil in crypto markets in 2022. Importantly, there are no official backstops for stablecoin issuers unlike those for depository institutions if there is a run on stablecoins. The risks can be more pronounced for algorithmic stablecoins – those whose peg price is controlled by smart contracts that manage interest rates or the supply of an endogenous token. Algorithmic stablecoins have not scaled successfully and have experienced sudden collapses, such as that of Terra's UST stablecoin in May 2022.

Cryptocurrency trading done on a network of multiple digital asset trading platforms can lead to fragmentation of liquidity if each of them hold dedicated pools of stablecoins for liquidity purposes to facilitate trading. Given the interconnectedness among these platforms, trading dislocation in one of them can propagate risks across the network. Another source of vulnerability is that the extent of leverage in the crypto asset market is difficult to quantify given the opacity of these positions. Consequently, it complicates assessment of the frequency of margin calls and liquidation of the positions that can occur. These risks will spillover directly to stablecoins as they are often used as collateral backing the leveraged positions, which in turn can amplify the stress.

Perhaps the most underestimated risk is the legal risks associated with the ownership of stablecoins and its use in collateralised trades. Section 2 highlighted that the lack of incorporation creates uncertainty about the transfer and creation rights over tokens (stablecoins are fungible tokens). Further, as the location of the distributed ledger where the tokens are located is not established, the jurisdiction where the disputes to the rights over the stablecoins held is to be settled is unclear. Finally, as stablecoins do not express a security interest in a registry, the regime of secured transactions is not applicable to stablecoins. All

[5] Seigniorage on banknotes is the interest payments received on government bonds purchased by central banks on the total amount of currency issued. https://www.bankofcanada.ca/2022/07/seigniorage/.

these will make the nature of the rights of stablecoin holders unclear under bankruptcy of the firm where they are held. When these legal uncertainties surface in stressed market conditions, stablecoins can be subject to runs. Given its role as the liquidity provider in crypto asset markets, and further compounded by the interconnectedness of crypto asset trading platforms, runs on stablecoins can have material consequences to the stability of the financial system.

To understand the mechanism and channels through which such risks can propagate, one must simply look to the Lehman bankruptcy and the run on the prime reserve money market fund (MMF) during the GFC. In a nutshell, the systemic dimension of Lehman bankruptcy surfaced through three channels: uncertainty over the valuation of securitised assets used as collateral; rehypothecation of collateral; and the use of co-mingled customer accounts in prime brokerage (Ramaswamy, 2017). The run on MMFs materialised when prime reserve fund broke the buck – the peg of $1 redemption value of each unit held in the fund not honoured (Baba et al, 2009).

The valuation of the crypto assets used as collateral crucially depend on the supply of liquidity through stablecoins that are lent to CeFi exchanges. If this supply gets disrupted, liquidity in crypto markets will fall substantially leading to sharp fall in prices of the crypto assets, and by implication the value of the collateral. The extent of collateral reuse – rehypothecation – on the crypto trading platforms, as well as the applicable haircuts on these collateral assets, is unclear and not documented. Further, the stablecoins that customers lend to earn interest income tend to reside on omnibus accounts and co-mingled with the crypto firms' own assets. As noted earlier, the lesson from the GFC was that the uncertainty surrounding the valuation of hard-to-value collateral assets used in lending, the inappropriate haircuts on them (making the price of collateral assets information sensitive), and the use of omnibus accounts to hold customer balances were key drivers of the risks leading to the bankruptcy of Lehman Brothers, which subsequently led to the run on MMFs. These constructs are all prevalent today in the crypto asset markets with stablecoins being the equivalent of MMFs in the crypto landscape, though with an important difference – MMFs are regulated unlike issuers of stablecoins.

Many are likely to question how a run on stablecoins with a market capitalisation of around $150 billion can create risks to the financial system that are systemic in nature given that they are traded within the crypto ecosystem. The MMFs, on the other hand with a significantly larger market size, are much more interlinked with the traditional financial system through their role as providers of short-term liquidity justifying their systemic importance. To answer the question raised, one has to look at the role stablecoins play in providing liquidity to the crypto asset markets, much like what the US Treasuries do to the global financial markets. Disruptions to liquidity in the US Treasury markets, as we know, will have negative consequences to global markets with sharp increases in volatility across all asset classes.

The average daily trading volume of US Treasuries in March 2024 was around $0.9 trillion and the outstanding amount of marketable securities was around $27 trillion. That means the average daily turnover is around 3.3 percent of the outstanding amount. In comparison, the daily turnover in March 2024 for USDT amounted to $85 billion with $104 billion stablecoins in circulation.[6] That implies the daily turnover is around 81.7 percent of the circulating supply. If we would map this against the daily turnover of US Treasuries, the $150 billion of stablecoins in circulation in March 2024 behaves as if there is $3.6 trillion in circulation.[7] If we go by this

[6] Based on data accessed on 22 March 2024 from https://coinmarketcap.com/currencies/tether/. The traded volume on CeFi exchange was $83.4 billion and on DeFi exchange it was $1.8 billion.

[7] This calculation is based on multiplying the $150 billion stablecoins in circulation by 24.5, which is the factor by which the daily turnover of USDT stablecoins exceed that of the US Treasuries normalised by market share.

imputed statistic, the important role stablecoins play in the crypto ecosystem becomes apparent, and any disruptions to the trading and/or the lack of access to stablecoins as collateral in crypto asset trading platforms can take on a systemic dimension within the crypto ecosystem.

How likely are that such risks in the crypto asset space can spillover to the broader financial system? That requires an assessment of the interconnectedness of the traditional and crypto asset financial systems. We begin with the observation that crypto firms cannot exist out of thin air. Crypto firms and crypto exchanges require credit from the traditional financial system to sustain their business activities. Payment of salaries, office leases, and purchase of supporting information technology infrastructure will all have to be settled in fiat currencies rather than in cryptocurrencies. That requires banking relationships and credit provisions from banks. Indeed, these linkages came to light during the banking turmoil in March 2023 in the United States when two banks, Silvergate Bank and Signature Bank, which specialised in serving the crypto industry had to be wound down. The extraordinary liquidity support given by the Federal Reserve and the blanket guarantees of all deposits by the FDIC in the troubled institutions prevented a deposit run on many regional US banks.

Larger banks can also be exposed to the crypto industry indirectly through their prime brokerage services to private equity firms and hedge funds that have sizeable exposures to crypto assets. But it is unclear what share of the bank lending to these firms are backed by cryptocurrency collateral. The new crypto asset prudential standards published by the Basel Committee on Banking Supervision (BCBS) and to be implemented in January 2025 will discourage banks to back loans with crypto assets because they will not be eligible as collateral (BCBS, 2022). The interlinkages can also work the other way round. Crypto firms will themselves be exposed to banks if they keep large deposit balances as reserves backing the stablecoins they have issued, and at the same time also use the same bank for provision of other financial services. The spillovers in this case can operate from the problem bank to the crypto firm. As the attraction of cryptocurrencies as a speculative asset class grows and more investor capital flows to them, the interlinkages between the crypto markets and the traditional financial markets will grow as the provision of credit services to crypto firms will become a useful source of additional revenue for banks.

5. Initiatives from regulatory authorities

A well-functioning crypto asset ecosystem requires a nominal anchor against which prices of crypto assets will be quoted and traded. Stablecoins serve this nominal anchor or unit-of-account function by tying their value to a fiat currency. This role as nominal anchor in the crypto asset space can result in some stablecoins scaling rapidly and gaining market dominance. If adverse market outcomes lead to a loss of confidence that these stablecoins can be redeemed at the peg value to the reference asset, there can be a risk of a run on those stablecoins. Section 4 highlighted the channels through which such risks can propagate and affect the broader financial system. Currently, the stablecoin issuer and the key participants in the stablecoin arrangement (e.g. a custodial wallet provider) are not subject to prudential regulatory standards that address these risks. At the same time, the number of different parties that may be involved in the stablecoin arrangement, and the operational complexity of these arrangements, can pose challenges to supervisory oversight.

A report published by the Financial Stability Board (FSB) draws attention to the risks to financial stability from stablecoins and calls for timely and pre-emptive evaluation of possible policy responses (FSB, 2022). For example, it highlights the similarity between stablecoin arrangements and MMFs with both offering redemptions at par or peg value. Yet, in the case of stablecoins, this stated aim comes without a guarantee and the redemption rights are not

well-defined. Moreover, the entity responsible for carrying out the redemption is not always clearly specified. In times of stress, investors may lose confidence in the issuer to redeem stablecoins at the peg value in fiat currency, and this can set-off a run on stablecoins, and in turn on other crypto assets. These runs can be more disruptive to the broader financial system and the real economy if the consolidation of various stablecoins leads to the issuance of a global stablecoin[8], and it is adopted in scale and enters the mainstream financial system as a store of value.

International regulatory authorities are now taking initiatives to address the potential spillover of risks from crypto assets to the traditional financial system. The BCBS, which has responsibility for setting prudential standards for banks' risk exposures, has come up with rules for the prudential treatment of crypto asset exposures (BCBS, 2022). Following a prescriptive list of classification criteria, the crypto asset exposures attract either risk weights based on the existing Basel Standards or a 1250 percent risk weight (effectively requiring the asset exposure to be backed fully by equity). For exposures to stablecoins to be assigned risk weights under the existing Basel Standards require among others the following conditions to be met: (a) The stablecoin issuer is supervised and regulated by a supervisor that applies prudential capital and liquidity requirements to the issuer; (b) Stablecoins held provide a robust legal claim against the issuer and/or underlying reserve assets and ensures full redeemability at all times and at their peg value within 5 calendar days; (c) Stablecoin arrangements must clearly define which parties have the right to redeem, including in instances where the parties involved may not be located in the same jurisdiction where the stablecoin is issued and redeemed; and (d) Operators of the transfer and settlement systems for the stablecoins, wallet providers, and administrators and custodians of the reserve assets must be regulated and supervised or subject to appropriate risk management standards. These and other conditions set the bar very high for banks holding stablecoins to assign risk weights that are lower than 1250 percent to these exposures.

As highlighted earlier, stablecoins at present are primarily used to facilitate trading, lending, or borrowing of other crypto assets through the crypto-asset trading platforms. The current stablecoins in circulation are not used as a means of payment, but this can change with some mainstream payment service providers announcing steps to support both cryptocurrencies and stablecoins in their payment network.[9] Moreover, international card schemes are launching debit and credit cards sponsored by crypto asset services providers or e-money institutions for payment purposes. These partnerships might go beyond payment services and include options of credit against crypto assets (see FSB, 2022).

The need to address the risks that stablecoins pose to the financial system has also taken on greater importance among US agencies (see PWG, 2021). One particular concern with stablecoins that has attracted much attention has been the prudential risks associated with respect to payment stablecoins – that is stablecoins that are used as a means of payment. A stablecoin's ability to function as a means of payment will have to rely on the activities of separate entities that may be highly distributed with complex interconnections. Consequently, a prudential framework that is exclusively focused only on stablecoin issuers is likely to leave certain payment system risks inadequately or inconsistently addressed. In view of this, the agencies recommended that the US Congress act promptly to ensure that payment stablecoins

[8] The FSB defines a global stablecoin as one with an existing or potential reach and use across multiple jurisdictions that could become systemically important in and across one or many jurisdictions, including as a means of making payments and/or as a store of value.

[9] See "MercadoLibre plans to accept BTC and cryptocurrencies as payment for all products", *Cointelegraph*, 2 December 2021.

are subject to appropriate federal prudential oversight on a consistent and comprehensive basis.

In their specific proposals, the agencies recommended that legislation should address the risks by establishing an appropriate federal prudential framework for payment stablecoin arrangements. With respect to stablecoin issuers, legislation should provide for supervision on a consolidated basis based on prudential standards and with access to appropriate components of the federal safety net. To accomplish these objectives, legislation should limit stablecoin issuance and the related activities of redemption and maintenance of reserve assets to entities that are insured depository institutions. The legislation should prohibit other entities from issuing payment stablecoins. Legislation should also ensure that supervisors have authority to implement standards to promote interoperability among stablecoins. Further, given the central role that custodial wallet providers play within a stablecoin arrangement, the agencies recommended that the US Congress should require custodial wallet providers to be subject to appropriate federal oversight. Such oversight should include authority to restrict these service providers from lending customer stablecoins, and to require compliance with appropriate risk-management, liquidity, and capital requirements.

The views of authorities in the Asia-Pacific region on the risks of crypto assets and how they should be regulated vary widely (SEACEN, 2024). Though these views are not necessarily restricted to stablecoins, central banks in the Asia-Pacific region generally tend to give more emphasis to the risks to investors from frauds, cyber risks and inaccurate or misleading representations and disclosures, as well as the risks to market integrity from AML/CFT-related issues. The worry that stablecoins could potentially undermine the monetary sovereignty through domestic investors preferring to hold stablecoins over the sovereign's money, as well as the challenges in monitoring and implementing capital controls, tend to outweigh other risks.

The regional views on the motivation to regulate stablecoins and other crypto asset issuers tend to focus on the consumer and investor protection rights. The susceptibility of stablecoins to runs and contagion risk have so far been given less importance in the region compared to how it is viewed in the advanced economies. Because a number of central banks in the region are of the opinion that the crypto assets tend to be speculative assets with no particular role for them in the real economy, they prefer to ban their use. At the same time, they are wary of the effectiveness of such a ban given the borderless nature of the crypto asset ecosystem.

Contrasting this view, a few central banks in the region are of the opinion that introducing a robust regulatory framework for stablecoins and crypto assets that provides clarity and consistency will be needed going forward. In December 2023, the Financial Services and the Treasury Bureau and the Hong Kong Monetary Authority (HKMA) jointly issued a public consultation paper on the legislative proposal for implementing the regulatory regime for stablecoin issuers in Hong Kong, inviting feedback from the public and stakeholders (FSTB, 2023). Under the proposed regime, an issuer would be required to obtain a licence from the HKMA if it issues a stablecoin that references the value of one or more fiat currencies ("fiat-referenced stablecoin") in Hong Kong. The issuer would be required to put in place an effective stabilisation mechanism, such as maintaining a pool of high-quality and highly liquid reserve assets with proper custody arrangement, with a view to ensuring that users would be able to redeem the stablecoins for fiat currency at par should they wish to do so. The regime also intends to prohibit stablecoin issuers from paying interest on the stablecoin holdings.

6. Considerations for policy

There is broad consensus among regulatory authorities that the proliferation of crypto assets and crypto asset service providers when left unregulated will pose serious threat to the integrity and safety of the financial system. The borderless nature of their operations requires a globally coordinated regulatory standards to address the risks and safeguard the stability of the financial system. As stablecoins play a key role in the functioning of crypto asset markets, regulatory efforts that are targeted towards stablecoin arrangements are likely to be more effective in risk mitigation. The policy position of the US agencies is aligned towards this goal. Building on the efforts that are already being contemplated, this section discusses the policy options that central banks may pursue while emphasising the underlying motivation.

The pervasive role of stablecoins in the crypto asset ecosystem relies on its use as collateral to provide liquidity and to support trading on crypto platforms. Absent this collateral role, trading costs and liquidity on crypto platforms will be adversely affected. Because stablecoins are fungible tokens stored on a distributed ledger, possessory security interests such as pledges that require transfer of possession are not applicable to stablecoins. As noted in Section 2, such restrictions make it difficult to use stablecoins as collateral in financial transactions. Consequently, legislation should prohibit the use of stablecoins as collateral given the legal uncertainty of the right to recourse under insolvency of the issuer or crypto platform.

The policy on whether stablecoin issuers should be allowed to pay interest to those holding the stablecoins needs careful analysis. If the stablecoins held are paid no interest, it would appear similar in intent to holding cash or the central bank digital currency. Yet its use case as an alternative to cash will only arise if it is designed with the feature of functioning as a payment stablecoin. That will raise different sets of risks. Absent the payment stablecoin feature, people holding stablecoins will be incentivised to lend them out to earn an interest income. But if stablecoin lending is prohibited through legislation, there will be little incentive for people to hold stablecoins. As highlighted in Section 3, stablecoin issuers have the incentive to earn the seigniorage, and there is evidence that they are already doing this. So far, the privilege to earn the seigniorage rests with central banks backed by their governments. Imposing a regulatory ban on stablecoin issuers to pay interest income on the stablecoins they issue will give them the legitimacy to earn the seigniorage. This in turn will create a misaligned incentive structure as the public holding stablecoins will be easily persuaded into lending them out to generate interest income. This negative externality can only be addressed if regulation also prohibits lending stablecoins as well as in using it as collateral in financial transactions. While the Basel Committee standards for crypto asset exposures are designed to have this economic effect – essentially not recognising such collateral as a risk mitigant in secured financing transactions – the remit is limited to financial institutions.

To the extent that stablecoins are backed by fiat currencies or commodity assets, issuers should be encouraged to pay interest rates on stablecoin holdings. That would align it more in line with MMF practices, which in the United States are regulated by the Securities and Exchange Commission that specifies the credit quality, issuer concentration and maturity of assets that MMFs can hold in their portfolios. The misaligned incentives of stablecoin issuers as regards financial stability become clear when one examines how their lending practices differ from MMFs. In the case of MMFs, the liabilities are simply net asset value claims of individuals, which are not marketable. By comparison, the stablecoins held in tokenised form on distributed ledgers on a blockchain are the liability claims of the individuals holding them. Stablecoin issuers use these liabilities as collateral to lend them on crypto asset platforms by offering an incentive fee to the stablecoin holders. This creates the cover for them to pay no direct interest on their liabilities and helping them to earn the seigniorage. Breaking this lending

practice that creates a network of externalities will require imposing a legislative ban on using stablecoins as collateral in secured financing transactions.

Regulation should mandate stablecoin issuers to obtain a license to operate that will require the issuer to provide information along a number of dimensions, including on risk management principles and governance. As recommended by the US agencies (see PWG, 2021), stablecoin issuers should be licensed to operate as insured depository institutions. The standards to which such institutions are subject to include capital and liquidity requirements, appropriate supervision and regulation, as well as a resolution regime to protect customers' insured liabilities. Additionally, supervisors should have the authority to implement standards to promote the interoperability among stablecoins to ensure that issuers do not create payment stablecoins that operate only within certain platforms to capture market power.

7. Summary and conclusions

Stablecoins, and cryptocurrencies more broadly, have evolved under the pretext that they do not rely on central bank money and trusted intermediaries by leveraging on the distributed ledger and blockchain technology. In practice, centralised intermediaries play a key role in channelling funds into the crypto universe, suggesting that there is a wide divergence between the crypto vision and reality. For example, USDT is a centralised stablecoin whose issuance and redemption of Tether tokens corresponds to fiat currency transactions executed solely by Tether through accounts it maintains at commercial banks. Within the crypto ecosystem, stablecoins have evolved from being a bespoke solution for avoiding the volatility of crypto assets, to becoming the nominal anchor for the pricing and trading of other cryptocurrencies and crypto assets.

Stablecoins are fungible tokens that are stored on a distributed ledger employing blockchain technology. The legal rights over the tokens are, however, fraught with uncertainty. Records of values stored in a distributed ledger, such as tokens, do not express a security interest in a registry, making its usefulness as collateral questionable. Stablecoins do not finance real economic activity and its use so far as a means of payment on e-commerce platforms is limited. Issuers are primarily motivated by the seigniorage they can generate by issuing the tokens.

Stablecoin arrangements create multiple links among crypto asset platforms and service providers, which can elevate systemic risk concerns during times of market stress. Moreover, as stablecoins provide an important source of liquidity to the crypto ecosystem, disruptions to the availability of stablecoins as collateral in crypto asset trading platforms can also activate systemic risk concerns within the crypto ecosystem. The paper highlighted a number of channels through which such risks can affect the functioning of the broader financial system.

Regulatory authorities across many jurisdictions are acutely aware of the inherent risks, and as the issuance of stablecoins grows to support the growth in the broader crypto asset markets, the risk of a stablecoin run of a large issuer can have material impact on the real economy. Several initiatives are underway as to how to address and mitigate such risks in the early stages. Requiring stablecoin issuers to be regulated and supervised as a depository institution is gaining some traction. The BCBS has introduced new standards to deal with bank's exposures to crypto assets to discourage large exposures to such assets on bank balance sheets. Imposing a ban on using stablecoins as collateral in financial transactions is a measure that is worth considering. If done, the crypto asset markets can fall precipitously. Central banks should be ready to deal with the financial stability implications this can have on the traditional financial markets.

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