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CBDCs, regulated stablecoins and tokenized traditional assets under the Basel Committee rules on cryptoassets

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Abstract

Purpose – This paper examines the impact of Central Bank Digital Currencies (CBDCs), regulated stablecoins and tokenized traditional assets on the cryptocurrency market, following the guidelines set by the Basel Committee. This study aims to analyze the implications for secure storage, cross-border transfers and necessary investments.

Design/methodology/approach – The paper uses a policy analysis approach to assess the potential effects of the Basel Committee's regulations on CBDCs, regulated stablecoins and tokenized traditional assets. It explores their impact on the cryptoasset market, strategies of central and commercial banks, payment systems and risk management.

Findings – The adoption of CBDCs, regulated stablecoins and tokenized traditional assets is expected to grow rapidly in the coming years. It raises concerns about secure storage, cross-border transfers and required investments. Central banks are likely to introduce CBDCs and authorize stablecoin issuance, aiming for efficient monetary policies and risk management. Basel III regulations may lead to asset tokenization by banks, reducing asset size and increasing fee-based income.

Originality/value – This paper provides insights into the potential impact of the Basel Committee's regulations on CBDCs, regulated stablecoins and tokenized traditional assets. It contributes to the understanding of the evolving cryptoasset market and the strategies of central and commercial banks in

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adopting these technologies. The findings offer valuable information for policymakers, regulators and market participants in navigating the changing landscape of digital assets.

Keywords Capital requirements, Banking regulation, Basel Committee, Cryptoassets, Bank asset-liability Management

Paper type General review

1. Introduction

Cryptoassets, also known as digital, virtual, or tokenized assets, use cryptography for security. They operate on a decentralized network, typically a blockchain, which allows for secure transactions and the creation of new units without the need for a state-appointed or controlled regulatory authority such as a central bank. This asset class began with Bitcoin as a payment tool and later expanded to include tokenized assets with features similar to securities. The market of cryptoassets turned a new page in 2022. The Financial Stability Board (FSB), International Monetary Fund (IMF) and Basel Committee on Banking Supervision (BCBS) respectively issued or proposed guidelines on regulating crypto assets. The FSB proposed a framework (FSB, 2022) for the international regulation of cryptoasset activities, which includes recommendations for the regulation, supervision and oversight of cryptoasset activities and markets and global stablecoin arrangements. From the perspective of regulators, a stablecoin is a type of cryptoasset that aims to maintain a stable value by pegging it to the value of a chosen fiat currency.

The FSB's recommendations are based on the principle of "same activity, same risk, same regulation" and aim to ensure that cryptoasset activities are subject to comprehensive regulation, commensurate with the risks they pose, while harnessing potential benefits of the technology behind them. The IMF endorsed in early 2023 the Elements of Effective Policies for Crypto Assets (IMF, 2023), which include ensuring predictability and enforceability of rights while appropriately classifying crypto, implementing strong anti-money laundering and combating the financing of terrorism (AML/CFT), prudential and conduct rules to cover all entities and activities related to the issuance, trading, custody or transfer of crypto. The IMF's new rules are grounded in its regulatory research findings, such as Bains *et al.* (2022a, 2022b) and He *et al.* (2022). The IMF and FSB also advanced policy and regulatory recommendations to identify and monitor risks posed by cryptoassets and stablecoin arrangements. The BCBS set out its prudential expectations related to banks' exposures to crypto-assets and related services, including conducting comprehensive analyses of the risks before acquiring exposures to crypto-assets or providing related services. The Basel Committee also released a new chapter of the consolidated Basel Framework called "SCO60: Cryptoasset exposures" that sets out the prudential treatment of banks' exposures to cryptoassets, including tokenized traditional assets, stablecoins and unbacked cryptoassets. The standard is effective immediately, but national regulators are requested to implement it by January 1, 2025 (BCBS, 2022).

The Basel Committee document on cryptoassets confirmed in December 2022 is the first regulatory document that discusses how banks should handle cryptoassets. Importantly, the document clearly allows banks to hold and trade cryptoassets and set detailed capital requirements on the cryptoassets.

This paper uses for its methodology the prospective policy analysis approach to examine the potential impacts of the new cryptoasset regulations proposed by the Basel Committee. Prospective policy analysis is a methodological approach that examines and predicts potential future policy outcomes based on current and anticipated conditions (Romer and Romer, 2010). This analysis allows policymakers and stakeholders to understand the evolving landscape surrounding policy changes, enabling more effective decision-making.

Prospective policy analysis has been applied to banking regulation, providing insights into the impacts of regulatory changes on the banking sector (Levine, 2004; Kusi *et al.*, 2019; Gerali *et al.*, 2010; Borio and Zhu, 2008; Kiemo and Kamau, 2021), guiding regulatory reforms for financial stability, competition and sustainable growth.

Specifically, the focus will be on how these rules will affect the Central Bank Digital Currency, regulated stablecoins and tokenized traditional assets. The analysis will explore their impact on various aspects, including:

- the development of the cryptoasset market;
- strategies used by central banks;
- strategies adopted by commercial banks;
- domestic and international payment systems;
- the risk faced by commercial banks; and
- the growth of the securities market.

It concludes that the use of CBDCs, regulated stablecoins and tokenized traditional assets, which will likely be classified as Group 1 Cryptoassets according to the Basel Committee's guidelines, will increase significantly in the very near future. The adoption of these cryptoassets raises concerns regarding secure storage, cross-border transfers and necessary investments. Central banks will be incentivized to launch CBDCs and authorize stablecoin issuance for potential benefits such as efficient monetary policies and risk management. Implementation of Basel III regulations will lead to asset tokenization by banks, which can reduce their asset size and increase their fee-based income.

The paper is organized as follows. Section 2 presents an introduction to the new Basel Committee rules regarding cryptoassets. Sections 3–6 critically evaluate the impacts and benefits that CBDCs, stablecoins and tokenized traditional assets have on central banks, commercial banks and financial markets. Finally, Section 7 offers conclusions and recommendations based on the findings discussed in the preceding sections.

2. Basel committee and its new rules on cryptoassets

The establishment of the BCBS in 1974 by the central bank governors of the Group of 10 countries (Schenk, 2014) sought to enhance the stability of the international banking system by promoting prudent banking practices and effective oversight (Drach, 2018). This committee has been instrumental in setting standards on various aspects of banking regulation and bank risk management, encompassing credit risk, market risk, liquidity risk, operational risk, country risk, reputation risk, climate risk and more (ElBannan, 2017). The Basel Accords, specifically Basel I, Basel II and Basel III, established three key pillars for banking supervision: minimum capital requirements, supervisory review and market discipline. The primary focus of the first pillar of the Basel Accords is on minimum capital requirements, which aim to ensure that banks maintain a sufficient level of capital to absorb losses and sustain operations during times of financial strain (Altman and Sabato, 2005). Adequate capitalization is of utmost importance for banks to withstand economic downturns and financial crises. The second pillar of the Basel Accords places significant emphasis on the supervisory review process, entailing the evaluation of banks' risk management practices and the adequacy of their capital buffers. Effective risk management is indispensable for banks to mitigate credit risk, liquidity risk and operational risk. Finally, the third pillar of the Basel Accords centers on market discipline, necessitating banks to disclose pertinent

information to market participants. Market discipline plays a pivotal role in fostering financial stability and curbing excessive risk-taking by banks (Bashir *et al.*, 2023).

The newly introduced regulations by the Basel Committee concerning cryptoassets pertain to the capital requirements outlined in Basel Accord Pillar 1. The regulations establish the minimum amount of capital that banks must possess in relation to their involvement with cryptoassets, which encompasses the treatment of stablecoins and cryptoassets lacking sufficient backing. In accordance with Basel Accord Pillar 2, these new regulations outline the process through which banks' exposure to cryptoassets will be subjected to supervisory review, which includes the identification and management of risks associated with said assets. Finally, the newly implemented regulations specify the disclosure obligations that banks must adhere to regarding their exposure to cryptoassets, which encompasses the disclosure of risks associated with such assets.

According to the new Basel Committee rules, cryptoassets are categorized into two groups:

(1) Group 1 cryptoassets: These are cryptoassets that fulfill a particular set of classification conditions. Group 1 cryptoassets encompass tokenized traditional assets (Group 1a) and cryptoassets with effective stabilization mechanisms (Group 1b). Group 1 cryptoassets are subjected to capital requirements based on the risk weights of underlying exposures, as delineated in the existing Basel Accord.

(2) Group 2 cryptoassets: These are cryptoassets that do not meet any of the classification conditions. Group 2 cryptoassets pose greater risks in comparison to Group 1 cryptoassets and are subjected to a newly prescribed, conservative capital treatment. Group 2 encompasses unbacked cryptoassets and tokenized traditional assets or stablecoins that fail to meet the classification conditions. Within Group 2, there exist further subdivisions: Group 2a, where a limited degree of hedging is permissible, and Group 2b, where hedging is not recognized.

Tokenized traditional assets are categorized into Group 1 Cryptoassets, with the same risk weights as traditional bank assets of comparable asset characteristics. Currently many central banks are testing their own central bank digital currencies (CBDCs). A domestic CBDC is a digital representation of a fiat currency, including its coins and banknotes. Typically, the central bank presents it as a complement to physical currency and intends to make it as legal tender. In certain jurisdictions, a new law will be required to establish the CBDC's legal status as legal tender. CBDCs issued by foreign central banks should be treated as foreign currencies, and their associated risks are connected to the sovereign risk of the issuing country. The guidelines of Basel Committee (BCBS, 2022) do not include any discussion on the capital requirements of CBDCs, but it does mention that it will provide further guidance on the treatment of CBDCs. However, when a CBDC is accepted as a legal tender, it is naturally classified as a Group 1 Cryptoasset. A regulated stablecoin refers to a cryptoassets pegged to a fiat currency and has met the regulatory standards set by a central bank. Put simply, regulated stablecoins can represent both domestic and foreign fiat currencies.

CBDC and regulated stablecoins, which are assumed to hold the value as fiat currencies, will be given a risk weight comparable to physical cash. Both foreign CBDCs and regulated stablecoins, pegged to a foreign currency, are exposed to exchange rate risk and should have related market-risk capital requirements. Obviously, the new regulations of Basel Committee (BCBS, 2022) do not penalize banks for holding and trading cryptoassets, if these cryptoassets are in the form of traditional bank assets that have been tokenized. The risk weights for these assets range from 0% to 100%. On the other hand, Bitcoins and other cryptoassets similar to Bitcoin are considered unbacked cryptoassets. These fall into Group 2

Cryptoassets and carry an exceptionally high risk weight of 1250%. If a Group 2 cryptoasset is actively tradable and has derivatives markets available for risk hedging, bank regulators may allow its capital requirement to be calculated under the Basel rules on market risk exposures. Consequently, the high risk weight assigned to unbacked cryptoassets, as well as the high market volatility of those actively traded unbacked cryptoassets, will discourage banks from holding and trading such unbacked cryptoassets. The following sections will evaluate the impact of CBDCs, regulated stablecoins and tokenized traditional assets for the future development of Foreign exchange (FX) and securities markets.

3. Central bank digital currencies

According to the August 16, 2024 statistics from the Atlantic Council (2024), 3 countries have launched CBDCs, 36 countries have piloted CBDCs and 44 countries are conducting research on developing CBDCs. Retail CBDC progress in the USA has halted, but other G7 banks like the Bank of England and the Bank of Japan are actively developing CBDC prototypes. The USA is focusing on wholesale CBDCs for interbank transactions, and there are currently 12 cross-border wholesale CBDC projects in motion. Some nations need new laws to authorize their central banks to issue CBDCs. For instance, the Federal Reserve explicitly affirms that it will only proceed with the development of a CBDC if there exists legislation that bestows the requisite authorization for its issuance (FRB, 2023). Consequently, it is anticipated that a diverse array of CBDCs will become accessible in the market in the forthcoming years. Various challenges emerge from the widespread use of CDBCs.

3.1 Digital wallets for individuals, merchants and banks

CBDCs are treated as legal tender, carrying the same status as government-backed banknotes. That means both individuals and merchants will use them for daily business transactions. The primary concern revolves around whether individuals possess the requisite digital wallets to hold and engage in transactions involving CBDCs. Additionally, it becomes imperative to evaluate whether banks are adequately equipped with the appropriate infrastructure to manage CBDC transactions.

When an individual expresses a desire to deposit CBDCs with a bank, comprehending how the bank will handle this process becomes crucial. Banks must establish the requisite systems and protocols to securely receive and store CBDC deposits. This endeavor might entail the formulation of novel digital wallet solutions or the assimilation of existing digital wallet providers into their banking infrastructure.

In addition, in case that a depositor has the intention to transfer their CBDCs from one bank to another, it is crucial to ascertain the mechanism through which this transfer will be facilitated. The interbank transfers of CBDCs necessitate synchronization and interoperability between the systems of diverse financial institutions. This endeavor may involve the formulation of standardized protocols and interfaces to ensure a seamless transfer of CBDCs across various banking establishments.

3.2 Cross-border transfers of central bank digital currencies

It is noteworthy to mention that while the transfer of Bitcoin and other "cryptocurrencies" across borders has been relatively uncomplicated in the past, the transfer of CBDCs between banks in different jurisdictions may introduce additional complexities.

The existing Know-Your-Customer and compliance regulations, which are designed to prevent money laundering and ensure regulatory adherence, may need to be modified to accommodate the cross-border transfer of CBDCs. The Transfer Regulation (FTR) of the European Union's (Markets in Crypto Assets) MiCA Acts, enacted in May 2023, mandates

that the transfer of cryptoassets within the EU must adhere to specific guidelines. The FTR necessitates comprehensive information about the sender and recipient to be linked to the transfer, and the complete set of originator information must accompany the crypto-asset transfer, irrespective of the quantity of crypto-assets being transacted. The objective of these new regulations is to ensure that crypto transfers can always be traced, and suspicious transactions can be prevented, and they are applicable to transfers of cryptoassets initiated by an "originator" and/or received by a "beneficiary" within the EU. However, it is important to note that these regulations do not pertain to person-to-person transfers conducted without a regulated crypto services provider. Banks from different jurisdictions will soon explore the application of existing compliance regulations on cross-border fund transfers to cross-border crypto transfers. The implementation of the FTR and similar regulations in different jurisdictions signifies that crypto payments and transfers are no longer anonymous, decentralized and deregulated.

Given the present condition of the banking industry, it is apparent that the sector is ill-equipped to address the upcoming demands of customers and business trends linked to CBDCs. Integrating CBDCs will necessitate substantial investments in technological infrastructure, regulatory frameworks and global collaboration to guarantee seamless and secure operations.

3.3 Wholesale Central bank digital currencies among Central banks

In 2022, the Bank for International Settlement (BIS) undertook a trial run for a cross-border transfer of CBDCs for four central banks, including the People's Bank of China, the Bank of Thailand, the Central Bank of the UAE and the Hong Kong Monetary Authority (BIS, 2022). In 2023, BIS arranged another experimental run of cross-border CBDC transfers for the Bank of France, the Monetary Authority of Singapore and the Swiss National Bank (BIS, 2023). Similar trial run exercises will continue because many central banks have expressed their interest in wholesale CBDC transfers.

Wholesale CBDCs backed by central banks offer a satisfactory level of trust and credibility to the global banking system. This central-bank CBDC market should include selected central banks as key members. It may later evolve to a larger wholesale CBDC market including leading global banks, such as those globally systemically important banks, as members. The wholesale CBDCs can enhance the efficiency and security of interbank settlements by providing real-time settlement and reducing counterparty risks (Auer *et al.*, 2020). The central-bank CBDC market enables central banks to acquire foreign-currency funds and provide liquidity in foreign currencies to the banks under their supervision. Commercial banks primarily hold various financial instruments denominated in multiple currencies, serving the purpose of international investments and short-term funding through the repo market. A liquidity crisis within a domestic banking system can emerge from both domestic and foreign currencies. In situations where there is significant tension between two nations or bilateral sanctions, the flow of funds between banks of these nations can be disrupted. However, the central-bank CBDCs market can help alleviate this issue, as a central bank can gain access to foreign funds through its cooperative relationships with other central banks in the international community.

3.4 Central bank digital currencies and monetary policy

CBDCs have the potential to yield significant consequences for the financial system. This capability can enable the promotion of financial inclusivity (Ozili, 2022). By offering a digital currency that is accessible to all individuals, regardless of their socioeconomic standing or geographic location, CBDCs can function to bridge the gap between the banked

and unbanked population. As a result, this can result in increased financial accessibility and participation, as well as improved efficiency in digital transactions.

Furthermore, CBDCs possess the capacity to enhance the efficacy of monetary policy. By equipping central banks with a direct mechanism for issuing and regulating digital currency, CBDCs can empower more accurate and targeted interventions in monetary policy. This, in turn, can enable central banks to effectively accomplish their policy objectives, such as ensuring price stability and fostering economic growth. Should a central bank accept deposits in the form of CBDCs from individuals, it will be able to effortlessly modify the money supply available to the public. Notably, alterations in interest rates within these deposit accounts will swiftly impact personal consumption. Presently, quantitative easing (QE) predominantly benefits large banks and corporations, as they can access low-cost funds provided by central banks. As a result, small and medium-sized enterprises (SMEs) and individuals do not immediately reap the associated advantages of QE (Boehl *et al.*, 2022).

3.5 Central bank digital currencies and government bonds

Some governments have a preference for issuing retail bonds to the public. These bonds are viewed by investors as investments with comparatively negligible risk (Prajapati *et al.*, 2021) and are often exempt from taxes, rendering them an appealing investment option for retail investors. To illustrate, the Russian government has released retail bonds that provide tax advantages to individual investors (Boldyreva *et al.*, 2020). The Hong Kong government has established a program for issuing retail bonds aimed at periodically offering them to the public in Hong Kong (HKG, 2023). This program encompasses several types of retail bonds, including Retail Green Bonds, iBonds (bonds linked to inflation) and other retail bonds. If all these retail bonds are tokenized, these governments would have the ability to sell them to retail investors and accept CBDCs as payment. This approach can serve as an effective method of tightening the money supply within the retail market. These transactions would involve the wallets of central banks and individuals.

3.6 Central bank digital currencies and commercial banks

CBDCs possess the capability to offer a direct method of payment and storage of value for individuals and enterprises, thereby circumventing the necessity for conventional bank accounts (Zabczyk and Griffoli, 2019). This could potentially result in a reduction in the demand for customary banking services, such as accepting deposits and facilitating payments, which are presently rendered by commercial banks. A decrease in the influx of deposits into the banking system has the potential to curtail the supply of credit by banks, elevate lending interest rates, undermine their profitability (Ozili, 2021; Risfandy *et al.*, 2022) and potentially heighten the risk of deposit outflows due to the scarcity of retail deposits. Consequently, commercial banks may need to adapt their business models in order to navigate this evolving scenario (Yingyun, 2023).

The discussion above displays the advantages that CBDCs bestow upon central banks when it comes to the execution of monetary policies. Furthermore, CBDCs also facilitate the direct allocation of government bonds to individuals and aid in the management of liquidity crises within the banking systems. Meanwhile, it is important to note that CBDCs can disrupt traditional banking activities, particularly in terms of accepting deposits, providing loans and administering payment services. A crucial concern arises in relation to digital wallets which make possible the transfer of CBDCs and encompass transactions involving CBDCs and various other assets, including goods, cryptoassets, financial instruments or CBDCs from other nations. These wallets play a fundamental role for individuals, retailers, financial institutions (both bank and nonbank), as well as central banks.

4. Regulated stablecoins

Basel Committee rules on cryptoassets specify how stablecoins are regulated. Only those stablecoins that successfully pass related Basel Committee requirements can be classified into Group 1 Cryptoassets. These requirements include:

- Redemption Risk Test: Stablecoins must pass a redemption risk test. This test ensures that the reserve assets backing the stablecoin are sufficient to enable it to be redeemable, even during periods of extreme stress. The reserve assets must be able to support the stablecoin's peg value.
- Basis Risk Test: The document mentions a basis risk test, which aims to ensure that the holder of a stablecoin can sell it in the market for an amount that closely tracks the peg value. However, it is noted that the committee decided not to implement this test at the time of publication. Further study will be conducted to identify statistical tests that can reliably identify low-risk stablecoins.
- Supervision/Regulation Requirement: Stablecoins must be issued by supervised and regulated entities. These entities must comply with prudential capital and liquidity requirements imposed by a supervisory authority. This requirement ensures that stablecoins are backed by entities with robust governance and redemption rights.
- Composition of Reserve Assets: For stablecoins pegged to one or more currencies, the redemption risk test includes a requirement that the reserve assets must consist of assets with minimal market risk and credit risk. The appropriate composition of reserve assets for the redemption risk test will be further studied by the Committee.

It is likely that most stablecoins will be unable to satisfy the above requirements and will fail to gain recognition by central banks under these Basel Committee rules.

4.1 Authority to issue stablecoins

These requirements grant the green light to the issuance of stablecoins. Stablecoins are analogous to banknotes printed by entities that are not the central bank. Currently, Hong Kong allows three commercial banks, namely HSBC, Standard Chartered Bank and Bank of China (Hong Kong), to print Hong Kong Dollar banknotes. In this mechanism, the banks are required to deposit US Dollars of equivalent value with the Hong Kong Monetary Authority.

In the UK, certain commercial banks in Scotland and Northern Ireland are authorized to print banknotes. They include Bank of Scotland, Royal Bank of Scotland and Clydesdale Bank in Scotland and Bank of Ireland and Danske Bank in Northern Ireland. These note-issuing banks are required to hold backing funds in a designated account known as the "collateral fund" with the Bank of England. These funds serve as a guarantee to ensure the convertibility of their banknotes into pound sterling.

Central banks will likely adopt a similar mechanism for stablecoin issuance, authorizing a small number of banks to issue stablecoins and requiring them to deposit an equivalent amount of fiat currencies with the central banks. Meanwhile, those selected banks should demonstrate their sophistication in technology infrastructure to support stablecoin issuances and transactions.

4.2 Stablecoins and foreign reserve of Central banks

The question of whether it is possible for an authorized bank to create stablecoins that are connected to local and foreign fiat currencies remains unresolved. If this possibility were to be allowed, the bank would have the capability to generate stablecoins linked to the euro through depositing euro funds, generate stablecoins tied to the US Dollar by depositing USD

funds and generate stablecoins connected to the Renminbi by depositing Renminbi funds. Additionally, this mechanism would facilitate the prompt increase of the respective central bank's national reserves in foreign currencies.

In the scenario where the central bank permits a domestic or foreign bank to issue stablecoins, the bank is required to initially convert foreign currencies into domestic currencies through the central bank. Subsequently, the bank deposits the converted domestic currencies with the central bank to facilitate the issuance of stablecoins. As a result, this process would also contribute to the increase of the central bank's foreign currency reserves.

The experience observed in Hong Kong can serve as a valuable lesson, potentially encouraging other governments or central banks to consider granting authorization for the issuance of stablecoins. In Hong Kong, the USD funds owned by note-issuing banks are securely held within the Exchange Fund, which is overseen by the Hong Kong Monetary Authority. As of the end of 2022, the total assets of the Exchange Fund amounted to HK $4,011.1bn, approximately equivalent to US$514bn (HKMA, 2023). With such substantial assets, the Exchange Fund ranks among the top 10 sovereign wealth funds worldwide. A central bank having a large amount of foreign reserves can provide several advantages. First, foreign reserves serve as a guarantee for the credibility and financial stability of a country (Misztal, 2021). By holding a significant amount of foreign reserves, a central bank can ensure the financial liquidity of the country and maintain the security of foreign exchange transactions (Misztal, 2021). Second, a large amount of foreign reserves allows a central bank to intervene in the foreign exchange market effectively. Central banks often accumulate foreign exchange reserves to have enough space for foreign exchange intervention without the risk of depleting reserves below the optimum level (Krušković, 2022). Increased foreign exchange reserves enable central banks to conduct wider and stronger interventions, which can help stabilize the exchange rate and maintain monetary stability (Dang, 2021). Furthermore, holding a substantial amount of foreign reserves can provide a buffer against external shocks and financial instability. Central banks accumulate foreign reserves to support the overall banking system and insure against financial instability (Heng and Corbett, 2014). In times of crisis or sudden stops in capital flows, having a large reserve stockpile can help mitigate the negative impacts on the economy and provide a sense of security (Davis *et al.*, 2020).

Foreign reserves also serve a function in managing the money supply and regulating inflation. The presence of increased foreign exchange reserves permits central banks to engage in interventions that have minimal impact on the money supply and exert little influence on the exchange rate (Dang, 2021). This capacity to intervene in the foreign exchange market without disturbing domestic monetary conditions can contribute to the preservation of price stability and bolster the inflation-targeting aims of the central bank (Dancourt, 2015). Furthermore, a central bank endowed with a substantial quantity of foreign reserves can shape the exchange rate and navigate currency fluctuations. Through the acquisition of foreign exchange reserves, the central bank can compel the entire economy to increase its savings, thus leading to a level of borrowing that is efficient (Davis *et al.*, 2020). This can serve to stabilize the exchange rate and enhance the competitiveness of exports. Additionally, the possession of foreign reserves can generate income for central banks. Reserves that are maintained by the central bank can produce a higher net interest income compared to currency that is in circulation (Hoffmann and Loeffler, 2017). This income can contribute to the financial stability of the central bank and provide supplementary resources for the execution of monetary policy operations.

Regulated stablecoins may be regarded as legal tender and hold a similar status to CBDCs. Consequently, digital wallets should possess the capability to facilitate the transfer of stablecoins and CBDCs.

The preceding discussion highlights the regulatory framework established by the Basel Committee regarding the issuance of stablecoins. It is crucial that stablecoin issuers must be entities that are subject to supervision and regulation. Through stablecoin issuance by selected issuing banks, central banks could yield significant advantages in enhancing their foreign reserves. This, in turn, would yield a multitude of benefits, including bolstering financial stability, enabling intervention in the foreign exchange market, facilitating effective management of the money supply, regulating inflation and generating income for central banks. These advantages, associated with central banks' foreign reserves, may serve as a compelling incentive for central banks to embrace stablecoin policies.

5. Tokenized traditional assets

The majority of bank assets consist of financial assets, which encompass customer loans (such as mortgages, personal loans and business loans), securities (such as government bonds, bank certificates of deposits, corporate bonds and mortgage-backed securities), interbank loans (ranging from overnight to 7-day and 30-day durations) and a small portion of cash. While certain assets generate substantial income, they also entail considerable credit risk and necessitate high capital requirements as per the Basel Committee's capital adequacy regulations. Consequently, over the past two decades, many banks have been eager to transition toward fee-based activities and divest high-risk assets. These strategic shifts toward fee-based activities have helped banks reduce their capital requirements and enhance profitability in terms of return on equity. (Calmès and Théoret, 2015; Williams and Rajaguru, 2012; Fields *et al.*, 2004).

5.1 Tough capital rules and asset-referenced tokens

The occurrence of the global financial crisis in 2008 prompted international bank regulators to formulate Basel III, a regulatory framework that places emphasis on leverage ratios, capital requirements and liquidity. Notably, the key regulations of Basel III were finalized in 2017 (BCBS, 2017). The primary objective of these regulations is to strengthen banks' ability to endure financial strain while enhancing transparency and disclosure practices. Nonetheless, due to the economic repercussions of the pandemic spanning from 2020 to 2023, the implementation of Basel III was postponed until the end of January 2023. Basel III, which is more rigorous compared to Basel II and Basel I, has substantial implications for bank assets.

In the first instance, banks are now obligated to maintain 4.5% of risk-weighted assets in the form of their own equity. Moreover, 6% of risk-weighted assets must consist of Tier 1 quality. These stipulated capital requirements compel banks to procure additional equity and long-term funds to support their lending and investment endeavors. By adhering to higher equity and capital ratios, regulators gain heightened confidence in banks' capacity to absorb losses. Nevertheless, these requirements translate into amplified funding costs and diminished profitability for banks in terms of return on equity and return on capital.

In the second instance, banks are obliged to increase their holdings of high-quality liquid assets (HQLAs) to satisfy a liquidity ratio for their deposit-taking and liquidity obligations through liquidity ratios, namely the liquidity coverage ratio. Moreover, banks are prompted to secure additional long-term funding to better align with their long-term assets to achieve a desirable net stable funding ratio. As a result, this leads to a decrease in income from HQLAs and an escalation in funding expenses for long-term funds.

Given such a regulatory environment, banks must reconsider their business strategies to hold less risky assets and generate more income from other fee-based banking services. Asset tokenization will become a tactic in which a bank tokenizes a corporate loan to be an asset-referenced token and sells the token to the bank's clients and or to the investors of any

cryptoasset exchanges. In addition, the bank may shift to helping corporate clients issue tokenized bonds rather than lending directly to them. These strategies reduce bank asset size and increase fee-based income.

5.2 Bank asset tokenization vs bank asset securitization

The asset tokenization efforts carried out collectively by banks will have a profound impact on the cryptoassets market in multiple ways. The magnitude of banks' asset size far surpasses that of equities, bonds or "cryptocurrencies (such as Bitcoin and others)". If a small portion of bank assets were to be converted into cryptoassets, the resulting market size would overshadow all previously commonly traded "cryptocurrencies". Furthermore, regulated banks, rather than crypto services providers, will assume pivotal roles within the cryptoasset market. These banks will actively engage in activities such as issuing cryptoassets, providing financial advice regarding crypto bond issuance, acting as market makers for cryptoassets and serving as cryptoasset fund managers, among others. These endeavors will contribute to enhanced profitability through the generation of fee-based income. The old framework for the cryptoasset market, which was established by crypto market participants prior to 2022, will be disrupted by relevant banking and securities laws.

When the regulations of Basel I and II were put into effect during the 1990s and 2000s respectively, financial institutions actively engaged in the sale of their loans and participation in the asset securitization market (Vallascas and Hagendorff, 2013). Under the Basel regulations, banks discovered that it was more advantageous to transform loans into bonds with high ratings through securitization and retain these securitized assets rather than keeping the original loans (Ambrose *et al.*, 2005). This shift in strategy was a result of the risk sensitivity of the capital requirements imposed by Basel I and Basel II. For instance, residential mortgage loans that were prudently underwritten necessitated a higher risk weighting and capital requirement compared to agency securities, which had a lower risk weighting and capital requirement.

The introduction of Basel I prompted banks to decrease lending and increase their holdings of assets with lower risk weights (Jacques, 2007). This change in asset allocation was driven by the aim to meet the capital requirements established by Basel I while minimizing risk. Banks acknowledged that holding securitized assets with lower risk weights would enable them to maintain sufficient capital while reducing the amount of capital tied up in higher-risk loans (Lundtofte and Nielsen, 2017). This approach was further reinforced by the implementation of Basel II, which provided more risk-sensitive capital requirements and allowed banks to use internal risk models to determine their capital needs (Jokivuolle and Vesala, 2007).

In addition to traditional bank assets, certain banks would use the cryptoasset market to distribute complex investment products, such as equity-linked notes, credit-linked notes and others, in tokenized formats. Presently, these products are disseminated through the banks' networks in private banking, corporate banking and institutional banking. Crypto exchanges offer a convenient avenue for the banks to access a broader pool of potential buyers from various jurisdictions. By selling their products through these exchanges, the banks can potentially reduce costs associated with suitability compliance. All the above incentives for banks signify the onset of a new era of asset tokenization within the banking community.

The discussion above highlights how Basel III regulations on capital requirements and liquidity requirements motivate banks to tokenize bank assets, such as transforming corporate loans into asset-referenced tokens. Banks will likely play a vital role in issuing and managing cryptoassets.

6. Cryptoassets, foreign exchange and securities

As of October 24, 2023, the dominance in the cryptoasset market is primarily established by the three "cryptocurrencies", namely Bitcoin, Ethereum and Tether USDt. These three assets collectively contribute to more than 77% of the overall market capitalization of all "cryptocurrencies". Notably, Bitcoin singularly accounts for more than 50% of the market share, whereas Ethereum accounts for over 17%. The total market capitalization of all "cryptocurrencies" is around US$1.25tn.

It is imperative to acknowledge that this distribution of market share will undergo a marked transformation in the upcoming three years as CBDCs, regulated stablecoins and Tokenized traditional assets embark on a trajectory of significant growth. FX represents the most extensive financial market across the globe, with a daily trading volume of approximately US$7.5tn, as reported by BIS (BIS, 2023). The forthcoming integration of wholesale CDBCs will soon become an integral component of this thriving FX market.

In 2022, the cumulative value of the global bond market amounted to a staggering US$133tn. On a global scale, the USA boasts the largest bond market, which is estimated to be valued at over US$51tn. Notably, most of the US bond market comprises government bonds, with an impressive $26tn worth of securities outstanding. China holds the second position with a 16% share of the overall global bond market, as reported by the World Economic Forum (WEF, 2023). Tokenization of both government bonds, corporate bonds and bank certificate of deposits will offer a more secure category of assets within the market of cryptoassets. Tokenized debt instruments will be traded and held by central banks, financial institutions and institutional investors for investment, funding liquidity management or both.

In sum, it is anticipated that CBDCs, regulated stablecoins, tokenized bank assets and tokenized debt instruments will emerge as dominant asset classes in the cryptoasset market in the foreseeable future.

7. Summary and conclusions

This paper has undertaken a prospective policy analysis of the potential impacts of CBDCs, regulated stablecoins and tokenized bank assets, which are on the verge of gaining popularity in both the banking industry and the cryptoasset market. The widespread adoption of these three categories of cryptoassets entails a range of concerns. First, individuals, merchants and banks will require secure digital wallets to store and transact with them. Second, the cross-border transfer of these cryptoassets presents additional complexities in terms of complying with AML regulations. Third, the prevalence of these cryptoassets will necessitate significant investments in technological infrastructure, regulatory frameworks and international collaboration.

Central banks should be motivated to introduce CBDCs and provide authorization for stablecoin issuance due to the numerous potential benefits that can be derived from such actions. These advantages include the efficient execution of monetary policies, augmentation of central bank reserves and the effective management of systemic risk in times of liquidity crises. Conversely, the implementation of Basel III regulations, which primarily center around leverage ratios, capital requirements and liquidity ratios, will compel banks to engage in asset tokenization. This strategic approach contributes to the reduction in the size of bank assets while simultaneously enhancing fee-based income.

For the past several decades, the Basel Committee's standards have been grounded in well-established principles of prudential regulation, risk management and international cooperation. Quantitative and econometric models have been applied to evaluate the effects of traditional bank regulations, intended to promote financial stability, adequate

capitalization and appropriate liquidity. However, the emergence of cryptoassets and the related new rules of the Basel Committee present novel practical challenges that existing models may not fully account for. Our paper has explored some of these challenges, such as how banks would adapt their risk management practices to accommodate the unique properties of cryptoassets. Also, some governments may take this opportunity to deploy new strategies and policies to regulate these new asset classes and the exchanges on which some of them are traded. Financial stability and investor protection will remain paramount considerations.

Based on the issues deliberated in this paper, the subsequent proposals are presented:

- Digital Wallet Infrastructure: In view of the increasing prevalence of CBDCs, it is crucial that individuals have access to appropriate digital wallets for the purpose of possessing and conducting transactions with these digital currencies. Banks should invest in the development of user-friendly and secure digital wallet solutions to facilitate the widespread adoption and usage of CBDCs.
- Interbank Coordination: Given the necessity for interbank transfers of CBDCs, it is vital for banks to collaborate and establish standardized protocols that ensure smooth interoperability between different banking systems. This coordinated effort will enable efficient and secure transfer of CBDCs, thereby improving the overall functioning of the digital currency ecosystem.
- Cross-Border Compliance: Compliance challenges related to AML regulations arise with cross-border transfers of CBDCs. Banks and regulatory authorities should work together to formulate strong frameworks and protocols that ensure compliance while facilitating the seamless flow of CBDCs across borders.
- Technological Investment: The implementation of CBDCs and stablecoins requires significant investments in technological infrastructure. Banks should allocate resources to enhance their systems, strengthen cybersecurity measures and ensure the scalability and efficiency of CBDC and stablecoin transactions.
- Asset Tokenization Strategy: Banks can consider asset tokenization as a strategic approach to meet the requirements of Basel III regulations and enhance profitability. By tokenizing assets such as corporate loans and bonds, banks can reduce risk-weighted assets, increase fee-based income and actively participate in the evolving crypto market. Banks should assess the advantages and challenges associated with asset tokenization and formulate appropriate strategies accordingly.
- Regulatory Adaptation: Regulators should proactively adapt to the changing financial landscape driven by CBDCs, stablecoins and bank asset tokenization. They should establish clear guidelines and frameworks to ensure consumer protection, market integrity and financial stability, while simultaneously fostering innovation and competition in the banking sector.
- Unified Regulation: Major regulators should work toward unifying their regulatory frameworks and enforcement principles regarding cryptoassets. Without this, banks may be able to engage in regulatory arbitrage, exploiting differences or loopholes in regulations to circumvent unfavorable rules or maximize profits.

The aforementioned recommendations highlight the need for banks and regulators to embrace technological advancements, collaborate effectively and adapt their strategies and frameworks to harness the potential benefits of CBDCs, stablecoins and asset tokenization, while effectively managing associated risks.

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