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CBDC IN VIETNAM

**Challenges of Central Bank Digital
Currency implementation**

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1. Introduction

Stablecoins from BigTechs like Diem (previously Libra) and private cryptocurrencies like Bitcoin have lately emerged, putting central banks on the defensive against private players providing their own digital alternatives to real currency. The advancement of information technology and its application to the financial sector have also prompted central banks and academics to consider the benefits of widely accessible central bank digital currencies (CBDC). The interest has recently increased dramatically as a result of the coronavirus pandemic's need for contactless payment options.

However, there are still a lot of risks and uncertainty associated with the implementation of CBDC, especially in an emerging market like Vietnam, where the financial market is still not completely developed. The two most prominent risks are specifically: (i) The danger of structural disintermediation of banks and concentration of the credit allocation mechanism inside the central bank, and (ii) The risk of facilitating systemic bank runs during times of stress. Moreover, there is a big concern from the Vietnamese public regarding privacy issues when implementing CBDC to replace physical currency. Thus, this study aims to discuss and highlight both benefits and key challenges when implementing CBDC in Vietnam. Based on that, we would like to suggest a set of policies and pathways which could be beneficial for Vietnamese government agencies when implementing CBDC in the future.

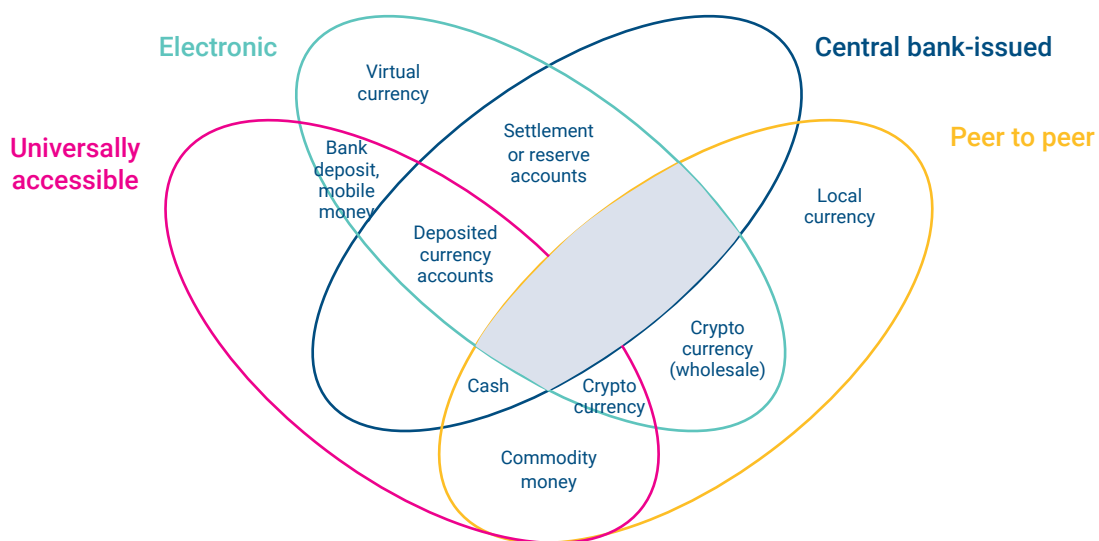
1.1 What is CBDC?

CBDC could be referred to as a sort of central bank money that is managed electronically and is available to the general public (*Bindseil, 2020*). Central bank digital currency (CBDC) is a new kind of digitized sovereign currency that is typically believed to be equivalent to physical cash (coins and banknotes) or financial institution reserves kept at the central bank. CBDC is predicted to eventually replace or coexist alongside physical currency and reserves (*Klaus Löber, Thompson & Caron, 2018*).

The Venn diagram in Figure 1 illustrates four critical characteristics of money: accessibility (general or limited), issuers (central bank or not), technology (account- or token-based), and form (digital or physical). The grey-colored region in the figure depicted the main possible characteristics of CBDC, which represents the interference zone between the central bank issuer and the digital form. The grey area is separated into four little units that represent a synthesis of two distinct technologies (account-based and token-based) and two distinct levels of accessibility (general purpose or wholesale). In terms of accessibility, the most often used terms are wholesale CBDC and retail CBDC, in that order.

This study addresses general purpose CBDC or CBDC, which could be used by the general public, since wholesale CBDC, the one only for specific firms, has a more restricted reach and does not call into question the monetary base's established structure.

Figure 1 | The money flower



The general-purposed CBDC might be implemented in one of two technological configurations. The first option is that CBDC might be made available to all families and businesses via central bank deposit accounts. This would not be very new technologically, but more a question of scaling the number of bank accounts already available. Central banks could rely on third parties to fulfill the servicing and technical maintenance of the accounts. The accounts may (but are not required to) include the standard access and payment capabilities associated with deposit accounts with banks, including internet- and app-based options.

Secondly, the central bank could issue a digital token currency that could be used in a way that doesn't need a central ledger to keep track of it. This is often linked to anonymity, which means that the central bank would not know who owns the tokens they have given out (like banknotes). For example, the ECB (2019) proposed a semi-anonymous DLT-based CBDC and showed how it works.

1.2. Vietnam's motivation for adopting

CBDC

According to a 2021 Bank for International Settlement's (BIS) poll of central banks, 86 percent are actively exploring the possibilities for CBDC, 60 percent are experimenting with the technology, and 14 percent are establishing trial programs (Boar & Wehrli, 2021). Additionally, according to the PWC CBDC global index (PwC, 2021), CBDC is not actually a new concept. More than 60 central banks have been exploring and researching the implication of CBDC since 2014. For instance, China's central bank hopes to create a digital version of the renminbi based on a centralized CBDC model (Andrew, 2020; Andrew, 2021). The Digital Currency Electronic Payment (DC/EP) project seems to be built in part on blockchain technology. Sweden's central bank has launched a one-year blockchain-based e-krona trial program for 2020, and the second phase of the project has continued from February 2021. The European Central Bank, Canada's central bank, and others are likewise speeding their R&D schedules. In 2020, the Bahamas was the first to deploy a blockchain-based CBDC (PwC, 2021).

The progress of CBDC exploration and implementation has accelerated rapidly recently worldwide. As of February 2022, according to the CBDC Tracker database (<https://cbdctracker.org/>), two countries have launched official CBDC, which are the Bahamas and Nigeria; 18 countries have started their pilot phases of the CBDC, such as China, South Korea, Saudi Arabia, South Africa and Canada; 13 countries are at the phase of the proof of concept such as Australia, Thailand, Russia and Sweden; and nearly 60 countries have been researching the implementation of CBDC, such as most of the European countries, USA, Southeast Asian countries and Japan.

The rapid development of CBDC worldwide, with some countries now entering implementation phases, has put immense pressure on the Vietnamese government to accelerate its own CBDC project. Since 2017, the Vietnamese government has implemented policies on managing virtual assets. In June 2021, the State Bank of Vietnam (SBV) was instructed in Decision 942/Q-TTg to explore the pilot usage of 'virtual money' based on blockchain technology during the following three years. This could be considered as Vietnam's active and urgent response to join the inevitable trend of sovereign digital currencies globally. In the near future, CBDC could be the main type of currency used in world trade and commerce, given their low-cost and safe protocols of payment. The emergence of digital currencies has the potential to improve the efficiency of cross-border payments and contribute to closing the \$1.7 trillion global trade finance gap (Yan & Ziyang, 2022).

In the context of Vietnam, the pilot phase of e-CNY since 2021 from the People's Bank of China has put Vietnam in a much more urgent situation to have its own CBDC infrastructures. After the initial success with the retail CBDC domestically, China is now conducting cross-border wholesale testing in addition to its domestic usage. It is collaborating with the Bank of International Settlements and Hong Kong, Thailand, and the United Arab Emirates on the mBridge project to construct a prototype for an interoperable wholesale CBDC (BIS Innovation Hub Hong Kong Centre, 2021). Therefore, Vietnam needs to have a standard CBDC infrastructure to match the world trade requirement. As the largest trade partner with Vietnam, China could urge Vietnam to adopt CBDC as the official currency for trade settlement and accept e-CNY for cross-border payments very shortly.

The pressure from neighboring Southeast Asian countries as key trade partners and competitors is also very high for Vietnam regarding their fast progress in CBDC development and implementation. Thailand and Malaysia's CBDC projects have entered pilot phases. Cambodia officially launched its DLT-based CBDC in 2020 and has been testing cross-border digital currency payment with Malaysia. However, ASEAN countries have very different approaches to CBDC designs. Thailand is adopting wholesale CBDC, while other ASEAN countries such as Cambodia, Malaysia, Vietnam are adopting retail ones. However, until CBDC projects aim to solve common issues such as more efficient payment systems or financial inclusion, the differences could be easily reconciled in the future.

1.3. CBDC design framework

The two exemplary CBDC design frameworks represent the two approaches currently researched and piloted by central banks around the world: the deposit-like CBDC designs (i.e., Bank of England – BoE and the cash-like CBDC designs (i.e., e-CNY from People's Bank of China - PBC).

Deposit-like CBDC design framework

The deposit-like CBDC design principles are as follows: (i) CBDC pays an adjustable rate of interest; (ii) CBDC and reserves are distinct entities that are not convertible; (iii) There is no guarantee of on-demand convertibility of bank deposits into CBDC (via an obligation on commercial banks or the central bank); and (iv) CBDC is issued by the central bank only in exchange for qualified assets (primarily government securities) (Kumhof & Noone, 2021).

The first important principle is that CBDC interest should be reversible. This allows the CBDC market to clear without necessitating major adjustments to the balance sheet or to the market's general price level. This implies that the demand for CBDC might be altered via the interest mechanism.

The second essential notion is that CBDC should be regarded separately from reserves, with the central bank abstaining from trading reserves in exchange for CBDC. This core notion enables the central bank to exercise control over the amount of reserves held in the financial sector, which has traditionally been a crucial tool for central banks in managing policy rates.

Thirdly, commercial banks should never be obliged to convert deposits to CBDC immediately. By requiring banks to convert deposits to CBDC on demand, the possibility of systemic runs is increased. These runs might occur much more swiftly and on a far larger scale than they do today when the only central bank money available to depositors is cash. The central bank may have considerable operational and political-economic restrictions in providing appropriate market-stabilizing liquidity support in such a circumstance. As a consequence, requiring banks to offer convertibility is a very dangerous proposition.

The fourth critical principle, which complements the second and third, is that the central bank may only issue CBDC in exchange for qualifying assets, typically government securities, with the central bank retaining authority over the definition of eligible assets. This is compatible with current central bank practice and, hence, is conservative rather than radical. What would be really revolutionary and exceedingly unpleasant is guaranteed issuance against bank deposits, ensuring banks' automatic unsecured lending

Cash-like CBDC design framework

The cash-like CBDC design concept is as follows: (i) A cash-like characteristic with no interest accrual; (ii) Low costs and convertible at will; (iii) Recognizable as both an account-based and a value-based system; (iv) Able to sustain anonymity

To begin, it is assumed that CBDC has cash-like properties. For lower-value transactions, user privacy is prioritized, and balances are not reimbursed. The e-CNY is intended to be a successor for the monetary base (M0). Thus, it is equivalent to the real RMB under M0, which does not carry interest and does not pay it.

Second, only the central bank is permitted to issue and redeem CBDC units. The exchange rate between CBDC and other forms of the same money is always 1:1, guaranteeing that CBDC has the same value as other forms of the same currency. As with physical RMB management, the PBOC charges no fees for exchange and circulation services, and operators do not charge individual customers for e-CNY exchange.

Thirdly, the design is two-tiered with intermediate levels. Rather than enrolling and servicing CBDC clients directly, the central bank relies on intermediaries who have access to central bank accounts and may draw on central bank reserve balances to distribute CBDC to users. Intermediaries facilitate transactions and perform custodial services on behalf of their clients.

Fourth, an independent „AML authority“ performs anti-money laundering/counter-terrorism financing inspections. This authority checks users involved in high-value transactions and bans the transfer of CBDC to embargoed users.

Both approaches of cash-like and deposit-like agreed that CBDC are more dependable, faster, and more efficient forms of money and should be encouraged for payment processing. The deposit-like approach views CBDC as a new form of central bank money that is not interchangeable with cash and hence has the potential to act as a new instrument for monetary policy (Kumhof & Noone, 2018). However, the PBC's „cash-like“ approach is much more popular and is now used in the creation of CBDC by a number of central banks worldwide, including the ECB (Bindseil, 2020) and the Swiss National Bank (Chaum, Grothoff, & Moser, 2021). Thus, this study focuses on the cash-like CBDC, given its popularity and suitability for the Vietnamese context.

2. Challenges for adopting CBDC in Vietnam

2.1. Vietnamese CBDC project

Currently, domestic payment transactions in Vietnam are relatively developed and could be processed via several different systems which mimic developed payment systems globally: (i) The State Bank of Vietnam (SBV) payment system including electronic/paper clearance and interbank electronic payment systems; (ii) The bank card switching and clearing system; (iii) The securities clearing and settlement system; and (iv) The credit institutions-operated and managed internal and bilateral payment systems (SBV, n.d.). Moreover, in 2019, SBV issued Circular No. 23/2019 as a legal framework for detailed guidance on the provision of e-wallet services and electronic clearing systems in Vietnam.

This SBV's maneuver and the relatively mature financial systems in Vietnam justify the readiness of Vietnam in terms of infrastructures, technologies, and more open government policies for substantial changes toward cashless and modern payment systems using the most advanced technologies. In fact, this becomes true in the Prime Minister's Decision 942/Q-TTg on June 15, 2021. In which, SBV was given three years to study the use of „virtual money“ based on blockchain technology. This is an extraordinary shift in the government's policies, considering that Vietnam has not yet recognized cryptocurrencies as legal. Until now, the central bank has frequently said that investors should avoid holding and trading Bitcoin and other cryptocurrencies since they are not legally protected.

Vietnam clearly joined global peers in developing central bank digital money (CBDC). However, until the first quarter of 2022, updates on the project have been very limited. Currently, Vietnam's legislation makes no mention of virtual money or virtual assets. At the moment, rules pertain only to the idea of electronic money (e-money), which is tied to a fiat currency and is available in the form of pre-paid bank cards, e-wallets, or mobile money. Vietnam's CBDC project is currently at the very early research phase, according to the CBDC Tracker database.

Compared to countries in the Southeast region with similar macroeconomics backgrounds, such as Thailand and Malaysia, the Vietnamese CBDC project is far behind. Thailand's retail CBDC project was officially announced in April 2021, just two months before the Vietnamese CBDC project, and moved directly to the proof of concept phase to draw public attention and discussion on the future digital Bath (*Bank of Thailand, 2021*). However, Thailand launched another wholesale CBDC project in 2018 and took advantage of the research phase in the wholesale project to move quickly in the retail project. Similarly, the Malaysia CBDC project is also at the proof of concept phase after launching the project in 2017 and achieving substantial achievement in 2021 (*Ahmat & Bashir, 2017*).

The phase of research for the CBDC project normally lasts about 3 to 5 years before forming a clear proof of concept for CBDC implementation, as indicated by Thailand, Malaysia, and other cases. Vietnam could take advantage of the experiences and research outputs of established CBDC projects to reduce the time for the research phase. In addition, as the Vietnam government decided to build CBDC based on blockchain technology and distributed ledger technology (DLT), the popularity of cryptocurrency and blockchain applications in Vietnam could help to boost the public adoption of CBDC. Blockchain technology has lately gained traction in the nation. Notably, the Ministry of Information and Communications has certified akaChain, a blockchain platform funded by FPT Software, as a solution for digital ID (*MIC, 2020*). In the private sector, several Vietnam-based blockchain startups have amassed a sizable global and local following: Axie Infinity, KardiaChain, and My Defi Pet, to name a few. These elements provide an enabling atmosphere for the digital economy and CBDC to thrive.

2.2. CBDC Legal and Regulatory framework in Vietnam

As is the case with any new technology, we must determine which laws and regulations will be directly affected if the SBV chooses to issue retail CBDC. Without a strong legal foundation for CBDC, legal and reputational risks could be substantially high.

It is likely that the retail Vietnamese CBDC will be issued as a new type of Vietnamese Dong currency. Amendments to the Law on the State Bank of Vietnam are required to prevent unambiguous inconsistencies between physical and digital money. This is because, under the existing legal framework, the Law on the State Bank of Vietnam and the Decision 130/2003/QD-TTg on the „protection of Vietnamese money“ recognize only notes as legal money. Second, the Law on the State Bank of Vietnam authorizes SBV to accomplish the primary goals of monetary stability, financial institution system stability, and payment system stability, as well as to be the only institution to issue and manage banknotes. Thus, any revision to the Law on the State Bank of Vietnam needs to consider these primary directions and address the key policy question of whether CBDC issuance could be viewed as a means of these essential purposes. If Vietnamese CBDC is considered as a legal alternative to the current physical currency note (Vietnam Dong), most of the existing legal framework about Vietnamese money and currency could be similarly applied to CBDC such as laws on protection, fighting, and checking the production of counterfeit CBDC, etc. Otherwise, if CBDC issuance is as a special operation of SBV, there would be whole new separating legal frameworks in order to manage and put digital central money into circulations and still maintain SBVs' capability to control and fulfill the

key objectives. Finally, prospective revisions to other legal and regulatory documents may include several prior decisions on managing cryptocurrency and virtual assets if the Vietnamese government recognizes digital money such as retail CBDC to be a nationally and systemically significant payment infrastructure subject to SBV regulation.

Additionally, amendments may be made to the Law of Credit Institutions, which establishes prudential standards for financial and credit institutions in terms of capital adequacy and liquidity assets if they are permitted to hold retail CBDC. The regulatory framework for payment systems between credit institutions, fintech companies, and payment services companies should also be revised to include CBDC as legal tender for money transactions. Moreover, SBV released Circular No. 23/2019 in 2019 as a legislative framework for thorough advice on the supply of electronic wallets and electronic clearing system services in Vietnam. This legal framework for electronic wallets and electronic transactions could be extended and served as the foundation to implement digital central bank currency.

Moreover, since Vietnam is a nation with foreign currency restrictions, we need to guarantee that retail CBDC transactions conform to the same degree of foreign exchange compliance and supervision as regular bank transactions. Otherwise, any disparity in how CBDC is treated under foreign currency control might constitute a regulatory gap that facilitates arbitrage, particularly considering CBDC's potentially borderless and frictionless character. This might eventually result in fluctuating capital flows and systemic hazards, which investors and consumers may bear.

Finally, if retail CBDC use becomes widespread in cross-border transactions, worldwide regulatory cooperation will be necessary to mitigate potential spillover effects. Given that the amount of anonymity encoded into each retail CBDC varies by nation, a lack of traceability and information sharing in cross-border transactions might potentially result in the establishment of channels for money laundering, terrorist funding, and sanctions evasion. Thus, central banks should cooperate to produce standards or best practices for the transnational use of CBDC, as well as to improve traceability and transparency

2.3. CBDC adoption in Vietnam

The public adoption levels of CBDC in Vietnam would be dependent on its usefulness and efficiency as an exchange medium for transactions. Existing work emphasizes efficiency. The main reasons why consumers opt for an electronic payment method rather than cash are acceptance, transaction speed, user-friendliness, and safety.

To determine the degree of CBDC adoption in Vietnam, we conducted a brief survey inquiring about their knowledge, comprehension of key CBDC characteristics, and level of adoption. The poll was done between the beginning of October and the middle of November 2021. Over 2000 participants

were contacted through email and phone to participate in the study. The survey is prepared and disseminated utilizing a self-administered questionnaire using Google Forms. The questionnaire was pilot tested to verify that it had face validity and was free of grammatical mistakes after being translated from English to Vietnamese. As a consequence, 1045 respondents completed the survey, and the responses of 1018 participants were utilized for data analysis following data cleaning and processing to exclude erroneous answer sheets, resulting in a response rate of 51 percent.

The empirical findings are based on a sample of 1018 individuals. The sample has 412 men (40.5 percent) and 606 females (59.5 %). Regarding respondent age, there are 290 individuals (28%) under the age of 25, 592 people (58%) between the ages of 25 and 40, 126 people (12%) between the ages of 40 and 55, and ten people (1%) beyond the age of 55. The sample achieves a sufficient level of representation for the Vietnamese population regarding age and gender distributions. Previous to the poll, 17 percent of respondents had no prior awareness of cryptocurrencies, 20.7 percent had little information, 43.4 percent had some knowledge, and 18.9 percent had a thorough comprehension of bitcoin themes.

According to the survey, more than 60 percent of the respondents in the survey have certain or good knowledge of cryptocurrency topics. Vietnam is ranked 1st in a total of 154 countries in terms of the global cryptocurrency adoption index from July 2020 to June 2021 (*Chainalysis, 2021*). When respondents were asked whether they would use Vietnamese CBDC if it were issued in the future, approximately 90 percent reacted positively. The high adoption rate might be attributed to the present popularity of cryptocurrencies and associated technologies in Vietnam (for example, blockchain). Interestingly enough, the cross-border payment option is the most popular (38%) in terms of the most wanted functionality of CBDC from the public. Additionally, the private nature of payments is a significant reason why Vietnamese individuals choose CBDC over other modes of payment (18%). Considering which technology should be used, according to the respondents, the public ledger technology (DLT) is the most chosen feature (43%) to be adopted when designing Vietnamese CBDC. Even though most respondents claim that the limited number of CBDC should not be fixed, 49 percent of them responded that the quantity of CBDC in circulation should be managed to make CBDC more attractive. This result suggests that the store-of-value function of CBDC could be an essential aspect to consider. The second most popular choice was using advanced technologies to keep the payment process more private (25%). Interestingly, integrating CBDC with current banking systems was the least attractive feature of CBDC in this survey

2.4. Infrastructure for CBDC issuance

Given that a retail CBDC would be a digital representation of currency, accessible primarily through digital wallets on smart devices, measures should be made to ensure cus-

tomers understand and feel comfortable transacting with such devices. Alternatively, for people who have trouble accessing or utilizing smart devices, a card-based payment mechanism (smartcards) compatible with CBDC may be used. Vietnam has over 125 million mobile phone customers as of February 2021, a penetration rate of 129 percent, according to the Ministry of Information and Communications (MIC, 2021). In Vietnam, about 70 percent of the total population are Internet users as of 2019, and also 70 percent of households in Vietnam have Internet connections. Since 2017, more than 97 percent of the total population has been covered by a mobile network of 2G, 3G, or 4G (MIC, 2021). In 2020, Vietnam was the tenth largest smartphone market in the world in 2020, with over 61 million users, according to a recent analysis on the global mobile market. Vietnam looks to have a competent level of digital literacy in terms of communication, as a nation with a relatively high smartphone use rate, with six out of ten mobile customers owning a smartphone. Because CBDC is intended to be held in digital wallets accessible through smart devices, there should be few barriers to entry for users in Vietnam, given the high level of digital literacy. Additionally, because of the challenges of double-spending and security issues (Chu et al., 2022), the offline transaction for CBDC is likely not viable for the first place of CBDC launching. Therefore, the online payment system would be the main option for CBDC, and good internet connections that give complete geographic coverage in Vietnam indicate digital infrastructure is an advantage rather than an obstacle in CBDC implementation.

However, the retail CBDC system would need the processing of massive amounts of transactional data, necessitating the use of high-performance cloud infrastructure. The network, servers, and databases may be handled locally or via a third-party cloud service. Due to the fact that retail CBDC transactions may involve sensitive personal data, data security may become a serious concern. This critical issue requires Vietnamese government agencies and private sectors to have more collaborations to make sure the effectiveness and efficiency of CBDC data management together with the data security issues.

A CBDC payment system would have to comply with anti-money laundering and counter-terrorist financing laws (AML) and regulations. This indicates that at least one authority or institution within the larger CBDC network must be aware of the identities of CBDC users and capable of certifying the transaction's authenticity. One possibility for the platform design is that each account is associated with a Payment Interface Provider (PIP) that is aware of each user's identity. Given the current technology infrastructure of SBV, this requires a considerable update of the legacy system if SBV wants to achieve this competence. Using third parties as PIP could be a better choice but requires closer cooperation between SBV, government agencies, and private sectors.

2.5. Auswirkungen der CBDC auf das vietnamesische Finanzsystem

The Vietnamese commercial banking system has been undergoing extensive changes since the 2011–2014 banking crisis (Huynh, Nasir, Nguyen, & Duong, 2020). Following the Global Financial Crisis (GFC) of 2007–2008, the fast growth of lending produced an asset-quality concern for the majority of Vietnamese commercial banks. Due to the concentration risk in the bank's loan portfolio during this credit boom phase, the Vietnamese banking system's contagion risk is also considerable. As a consequence, the average ratio of non-performing loans to total bank capital in the banking system increased from less than 5 percent in 2011 to almost 12% in 2012 and around 15 percent in 2014 (Asian Development Bank, 2014). Recently, the non-performing loan in the Vietnamese banking system has been significantly improved, but the contagion risk between banks is still considerable (Pham, Ngo, Nguyen, & Le, 2021). Therefore, CBDC issuance by SBV could also impose severe risks on the whole commercial banking system.

First, If CBDC is deemed an appealing alternative store of value and earns interest, it may result in banking disintermediation, as families and companies may choose to replace bank deposits with Vietnamese CBDC, resulting in deposit outflows. Banks would be encouraged to raise deposit rates in such a situation, resulting in increased bank financing costs and revenue depression. Banks may then pass these expenses on to borrowers or pursue riskier investments in quest of bigger returns. Additionally, banks would be required to hold extra liquidity in order to meet CBDC demand. As a result, this would have an effect on the size and risk profile of banks' balance sheets, as well as their profitability. If, on the other hand, CBDC is structured to be non-interest bearing, the general public will have no motivation to convert from bank deposits to CBDC, limiting the impact of banking disintermediation.

Additionally, a systemic bank run is possible during times of economic or financial market instability. With the benefit of technology, a perceived „flight to quality“ from bank deposits to CBDC might occur at an unprecedented rate through digital channels.

However, others argue that easy access to CBDC may increase the transmission of policy rates to the money and credit markets. CBDC could improve the control of money in circulation of SBV by directly crediting supportive funds as CBDC into individual's or SMEs' accounts without via the intermediate roles of commercial banking systems. Additionally, assuming CBDC obtains an unusually favorable interest rate, institutional investors' allocations may move away from low-risk assets such as short-term government securities and toward CBDC, impacting the pricing of these assets. As a consequence, central banks could use CBDC as a new tool for formulating monetary policy. When CBDC, on the other hand, pays no interest, the risk of competing with low-risk assets such as commercial bank deposits is lessened, hence minimizing the possibility of monetary policy impact.

3. Policy implication

3.1. Public trust and adoption

Establishing and sustaining public confidence in the central bank as the issuer of CBDC and operator of the national system will be critical for a monetary system to work properly, securely, and resiliently. The public must have faith in the CBDC. In order to build and maintain trust, central banks need to clearly define the CBDC system's standards, rules, risk management guidelines, and governance structures related to CBDC infrastructures. For example, to facilitate the issuance of CBDC as high-quality assets, SBV could regulate that CBDC might be backed by qualified assets, similar to how banknotes are backed by reserves, to bolster public confidence in the CBDC's value stability. Another critical issue that the Vietnamese Government and SBV should address relates to the technology that underpins the CBDC system. It must adhere to the strictest security requirements to prevent any cyber risks. Additionally, the rulebook should define the duties and obligations of CBDC operators, service providers, and other players in order to hold them responsible for their contributions to the CBDC ecosystem.

Currently, these critical issues are still not clear in the approach of SBV to CBDC. More importantly, nearly nine months after the decision to start the CBDC project, there has been very limited communication from SBV and government agencies about the progress of the Vietnamese CBDC project. There has been no official document, research paper, or statement of SBV about the general framework of CBDC implementation in Vietnam. This could create a considerable cognitive gap between the real public expectation about CBDC and the approach of SBV to implement CBDC. If this cognitive gap is actually large, the public adoption of CBDC could lead to severe problems considering the popularity and the competition from private cryptocurrencies like Bitcoin or Ethereum in Vietnam. To address this weakness, Thailand, Malaysia, Indonesia, and even China have frequently communicated their approach to CBDC to the public and remained open to feedback from experts and the public to design their approaches to CBDC. Therefore, the Vietnam government and SBV should create a CBDC implementation strategy and a business continuity plan that includes stakeholder participation and public communication in order to increase public knowledge, user acceptance, and trust.

Moreover, it is critical that SBV assess CBDC's competitiveness against private cryptocurrencies such as Bitcoin or Ethereum in order to entice the public to embrace CBDC. Our survey results suggest that Vietnamese people's digital currency literacy is at a high level as more than 60 percent of the respondents have certain or good knowledge of cryptocurrency topics. These are the advantages but also disadvantages of CBDC adoption in Vietnam. To increase public adoption of CBDC in Vietnam, our survey shows that the top three most essential variables affecting CBDC acceptance are cross-border payment compatibility, payment privacy, and smart-

phone compatibility with CBDC. When it comes to utilizing CBDC, those with a greater income, age, and education pay more attention to the privacy matter. The public anticipates that CBDC will use distributed ledger technology to enhance the openness and privacy of payment procedures. From the survey, CBDC is expected to be „cash-like“ in nature and to share many of the characteristics of private cryptocurrencies, such as private payment and unaltered historical transactions through distributed ledger technology. It is clear that there is a trade-off between privacy protection and the needs for anti-money laundering and anti-crime/ terrorist financing when designing CBDC. However, it is recommended that SBV consider these criteria of privacy protection and try to mitigate the trade-off to some extent while constructing CBDC design and implementation

3.2. Mitigating impacts on current financial systems

The commercial banking system in Vietnam has been dominant for a long time as the key intermediary for capital deposits and lending services. However, implementing CBDC may result in deposit outflows and lower bank lending. However, we believe that the danger from disintermediation is modest in Vietnam since Vietnamese banks' total deposits presently outnumber banks' total loans and investments. In 2019, according to SBV, the ratio of loans and investments to deposits (Market I) for the whole credit system was about 87 percent. Furthermore, in the near future, the digital payment systems using smartphones and e-wallets via the cooperation between banks and Fintech companies in Vietnam are expected to maintain their domination even after CBDC is issued. Thus, there are reasons for CBDC users to convert the funds back to deposits, which would assist in counteracting deposit withdrawals, such as the requirement to utilize financial services provided by banks.

Additionally, a systemic bank run might occur during times of economic or financial market instability. The requirement for banks to obtain additional liquidity in order to fulfill big withdrawals might result in a liquidity crunch in the money markets, with ramifications for monetary policy and overall financial stability. To prevent the higher risk of the bank run with CBDC, SBV could impose withdrawal or holding limitations to limit CBDC convertibility from bank deposits or set tiered compensation rates on CBDC holdings to dissuade runs.

However, in the long-term, as CBDC would be a much safer and more cost-effective means for digital payments, the risk of banking disintermediation and bank run is severe. Thus, SBV could consider some suggestions to address this issue in their CBDC design. First, CBDC should be designed to encourage the use of CBDC as a method of payment rather than a store of value, for example by placing a limit on conversions from deposits to CBDC or by providing no interest or signi-

ificantly lower interest rates on CBDC compared to bank deposits. In the situation of Vietnam, the banking system's capital remained weak when most banks in the system delayed implementing full Basel II frameworks and regulations (*Fitch Wire, 2019*). Thus, in the long-term, SBV should have stronger prudential control, proper capital and liquidity buffers, deposit insurance, and a commitment to settle interbank payments in reserves at parity are all required. Eventually, CBDC could be referred to as the advanced product of developed financial systems. Therefore, it still requires SBV to continue to have stronger measures and policies framework to improve banking system health so that it can absorb the inevitable impacts of CBDC in the long term and in different crisis scenarios. For example, SBV could increase the capital and liquidity requirements for banks and be ready to provide a sufficient deposit guarantee plan to aid in the prevention of run-offs.

3.3. CBDC in international trades

CBDC might be used to evade foreign exchange restrictions in Vietnam, which presently ban some outbound foreign currency transactions to avoid foreign exchange volatility because of its potentially borderless and frictionless nature (subject to its design). Furthermore, high-volume and high-value transactions might occur instantly through CBDC, thereby fueling larger capital flow volatility. Finally, allowing both citizens and non-residents to easily move and trade the CBDC both domestically and overseas might result in adverse effects on the fiat Vietnamese Dong, putting the SBV's capacity to maintain exchange rate stability in jeopardy. Thus, SBV might have to issue regulations on using CBDC to limit CBDC transfers and non-resident ownership to avoid speculative capital movements.

In the long term, digital currency could be used effectively as a means of international trade. As China and other countries in Asian regions, Vietnam's leading trading partners, have officially rolled out their CBDC project, Vietnam could consider forming learning relationships with them in CBDC issuance. Then, closer cooperation could be established bilateral or multilateral to build common frameworks for using CBDC in international trades between partners. This could help to mitigate the use of solely a few dominant currencies for international trades, such as the US Dollar or Euro. On the other hand, because Vietnam is still lagging behind in its process of issuing Vietnamese CBDC, it should be cautious about the impacts of China CBDC as China could force private companies in Vietnam to use their e-CNY in trading in Vietnam territories. This could lead to direct competition between e-CNY and Vietnamese CBDC in the future as well as the risk of China dollarization. Therefore, strict regulations about the use of e-CNY in Vietnam should be seriously considered by SBV.

3.4. Vietnamese CBDC design suggestions

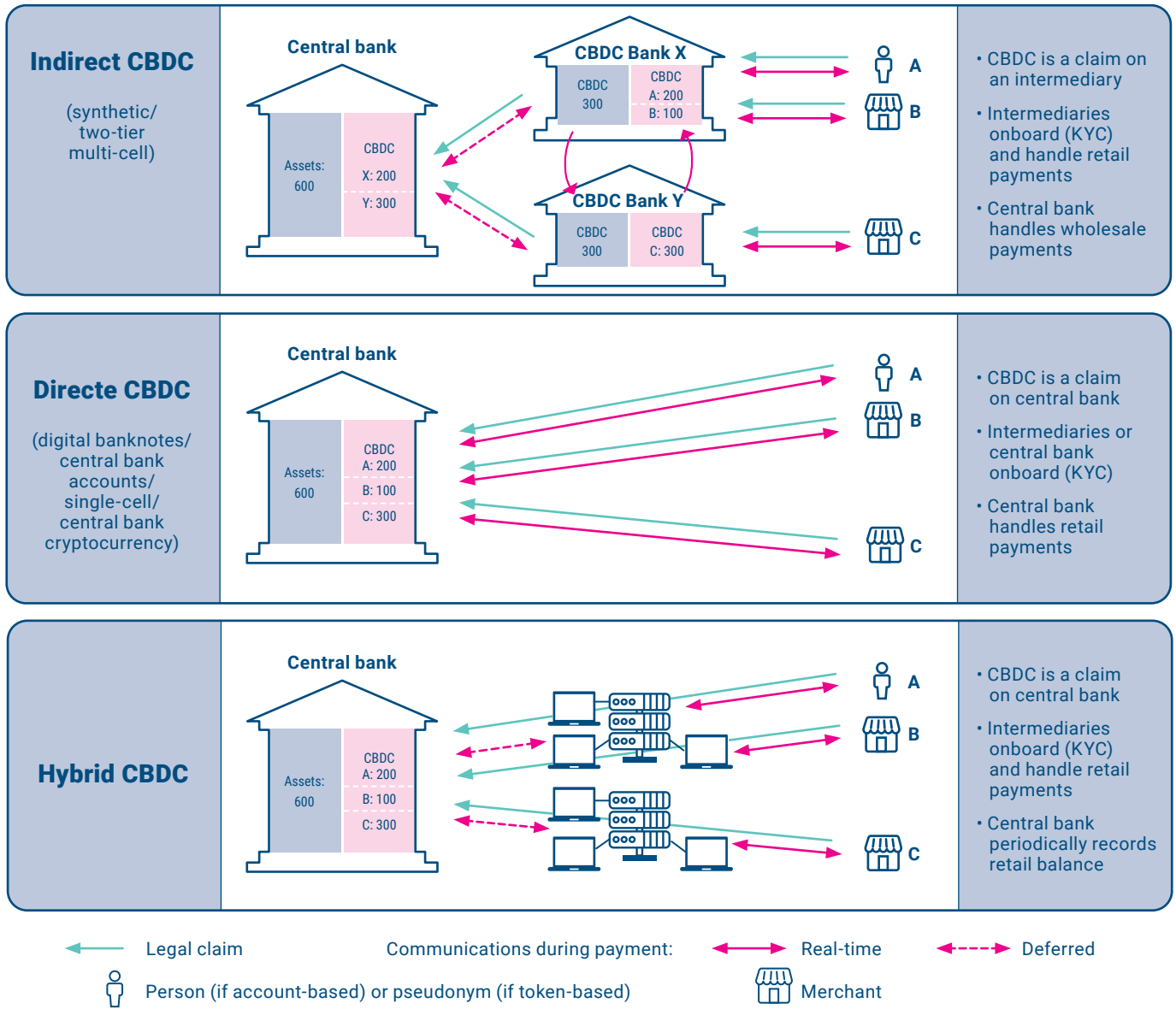
Based on all issues above, some suggestions on CBDC design in Vietnam could be proposed. First, CBDC is a relatively new concept, and the real impacts on the current financial

systems in Vietnam are extremely hard to estimate given the fragile Vietnamese banking systems. Thus, SBV must perform pilot projects in particular regions, with a focus on CBDC's implications for monetary policy, financial markets, and financial stability. In response to the results of the pilot projects, SBV will iterate and improve the CBDC design. As a result, SBV will need collaboration from a wide range of stakeholders and organizations in the Vietnamese financial system, including commercial banks, funds, investment companies, security firms, and other financial institutions. The Ministry of Finance and other government organizations should join forces to boost the process of researching and piloting Vietnamese CBDC. Until now, SBV could be over-scrutinized to come up with the proper approach of Vietnamese CBDC. However, because of its complexity and broad impacts on every individual, regular communications and openness to receive feedback about the CBDC project should be prioritized over scrutinization.

Regarding the choice between token-based or account-based retail CBDC, some reasons support the account-based CBDC in Vietnam. First, the Vietnamese government has already favored the choice of account-based digital currency. For example, Vietnam adopted a policy of not utilizing physical currency in transactions from 2021 to 2025 in Decision No.1813 of the Prime Minister on October 28, 2021. However, in addition to popularizing the digital payment systems, Vietnamese government places an extremely high priority on the transparency of economic transactions and compliance with anti-money laundering legislation through the use of Payment Interface Providers. Second, in contrast to account-based CBDC, while implementing token-based CBDC, it is critical that the government first establish a framework for monitoring and managing anomalous and large-amount money transactions in order to reduce money-laundering activities. The ECB's proposed anonymity voucher might be a possibility. However, the expense of implementing these technologies might be too expensive for Vietnam. Aside from that, the proof-of-work approach for token-based digital money will inevitably be slower than immediate cash transfer via account systems. Third, compared to the account-based CBDC, central banks would be less acquainted with token-based CBDC, which would have high costs in terms of personnel and monetary resources.

It is envisaged that SBV would utilize the account-based technique to issue CBDC. According to our poll, the essential criteria for future CBDC acceptance are dependent on its usefulness and efficiency as an exchange medium for transactions while complying with privacy regulations. As a result, in addition to SBV, the larger CBDC network in Vietnam should include Payment Interface Providers to authenticate the user's identification as the Hybrid CBDC architecture in Figure 3 presented.

Figure 2 | Potential retail CBDC architecture



Source: Auer, Haene, & Holden, 2021

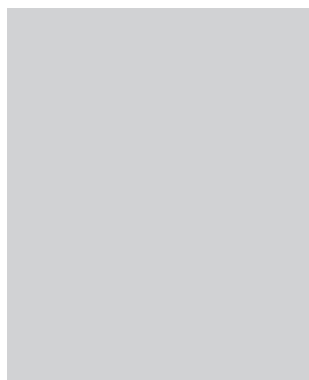
In addition, in terms of account-based CBDC transparency, the problem of private information leakage is critical. Another danger of the account-based method is that the account or identity might be compromised. As a result, the authority department should pay greater attention to cyber security risks.

In conclusion, if Vietnamese government continues to delay their acts on CBDC issue, the global pressure of implementing CBDC in the near future could possibly forces them to passively react and adopt a particular system of CBDC. However, through this paper, we highlight many challenges and provide a set of recommendations which could be considered by Vietnamese Government agencies to thoroughly design the Vietnamese CBDC.

References

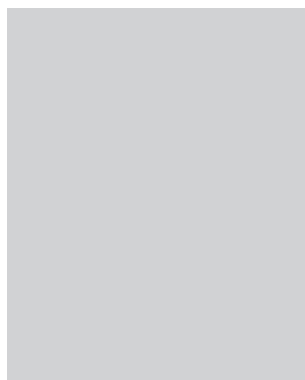
- Ahmat, N., & Bashir, S.** (2017). *Central Bank Digital Currency: A Monetary Policy Perspective*. Retrieved from: www.bnm.gov.my
- Andrew Work** (2020). Crypto RMB: Finance Innovation or New Tool for Control? China's New Digital Currency and What It Means to The World. Retrived from: <https://shop.freiheit.org/#!/Publikation/898>
- Andrew Work** (2021). The Rise of the e-RMB: Domestic Control, Global Influence. Retrived from: <https://www.freiheit.org/publikation/rise-e-rmb-domestic-control-global-influence>
- Auer, R., Haene, P., & Holden, H.** (2021). Multi-CBDC arrangements and the future of crossborder payments. *Bank For International Settlements*, 41(2), 33–39. Retrieved from: <https://www.bis.org/publ/bppdf/bispap115.htm>
- Bank of Thailand.** (2021). *The Way Forward for Retail Central Bank Digital Currency in Thailand*.
- Bech, M. L., & Garratt, R.** (2017). Central Bank Cryptocurrencies. *Ssrn*, (September), 55–70. Retrieved from: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3041906
- Bindseil, U.** (2020). Tiered CBDC and the Financial System. *SSRN Electronic Journal*. <https://doi.org/10.2139/SSRN.3513422>
- BIS Innovation Hub Hong Kong Centre.** (2021). *Inthanon-LionRock to mBridge*. Retrieved from: <https://www.bis.org/speeches/sp180704a.htm>
- Boar, C., & Wehrli, A.** (2021). Ready, steady, go? – Results of the third BIS survey on central bank digital currency. *BIS Papers*, (114), 77–82. Retrieved from: www.bis.org
- Chainalysis.** (2021). The 2020 Geography of Cryptocurrency Report. In *Chainalysis*. Retrieved from: <https://go.chainalysis.com/2021-geography-of-crypto.html>
- Chu, Y., Lee, J., Kim, S., Kim, H., Yoon, Y., & Chung, H.** (2022). *Review of Offline Payment Function of CBDC Considering Security Requirements*. *Applied Sciences*, 12(9), 4488.
- Development Bank, A.** (2014). *VIET NAM FINANCIAL SECTOR ASSESSMENT, STRATEGY, AND ROAD MAP Viet Nam: Financial Sector Assessment, Strategy, and Road Map*. Retrieved from: www.adb.org
- ECB.** (2019). Exploring anonymity in central bank digital currencies. In *In Focus*. Retrieved from: <https://www.ecb.europa.eu/paym/intro/publications/pdf/ecb.mipinfocus191217.en.pdf>
- Fitch Wire.** (2019). Vietnam Banks' Capital to Remain Weak After Basel II Delay. Retrieved March 15, 2022, from: <https://www.fitchratings.com/research/banks/vietnam-banks-capital-to-remain-weak-after-basel-ii-delay-22-12-2019>
- Huynh, T. L. D., Nasir, M. A., Nguyen, S. P., & Duong, D.** (2020). An assessment of contagion risks in the banking system using non-parametric and Copula approaches. *Economic Analysis and Policy*, 65, 105–116. <https://doi.org/10.1016/J.EAP.2019.11.007>
- Klaus Löber, Thompson, C., & Caron, F.** (2018). Central bank digital currencies Report. In *Committee on Payments and Market Infrastructures. Bank for International Settlement*. Retrieved from: www.bis.org.
- Kumhof, M., & Noone, C.** (2021). Central bank digital currencies – Design principles for financial stability. *Economic Analysis and Policy*, 71, 553–572. Retrieved from: <https://doi.org/10.1016/J.EAP.2021.06.012>
- MIC.** (2020). Make-in-Vietnam blockchain platform debuts to assist digital transformation. Retrieved March 11, 2022, from: <https://english.mic.gov.vn/Pages/TinTuc/143962/Make-in-Vietnam-blockchain-platform-debuts-to-assist-digital-transformation.html>
- MIC.** (2021). *White book of viet nam information and communication*. Retrieved from: https://english.mic.gov.vn/Upload_Moi/TinTuc/WhiteBook2020-Final.pdf
- Pham, K. D., Ngo, M. V., Nguyen, H. H., & Le, V. L. T.** (2021). Financial crisis and diversification strategies: the impact on bank risk and performance. *Economics and Business Letters*, 10(3), 249–261. <https://doi.org/10.17811/EBL.10.3.2021.249-261>
- PwC.** (2021). *PwC CBDC global index PwC Global CBDC Index 2021*. Retrieved from: <https://www.pwc.com/gx/en/industries/financial-services/assets/pwc-cbdc-global-index-1st-edition-april-2021.pdf>
- SBV.** (n.d.). SBV - Payment System. Retrieved March 11, 2022, from: https://www.sbv.gov.vn/webcenter/portal/en/home/sbv/paytreasury/paysystem;jsessionid=GDZ33zYZS-FRiqX2Wlix7Sk3JC7ukNAlaWv4U5FTF7sTvEC6HY-yTc!-1043201691!-596713391?_afLoop=48913894850774224#%40%3F_afLoop%3D48913894850774224%26centerWidth%3D80%2525%26leftWidth%3D20%2525%26rightWidth%3D0%2525%26showFooter%3Dfalse%26showHeader%3Dfalse%26_adf.ctrl-state%3Dep0j1jy1x_4
- Yan, X., & Ziyang, F.** (2022). 3 ways digital currencies could change global trade . Retrieved March 5, 2022, from World Economic Forum website: <https://www.weforum.org/agenda/2022/01/digital-currencies-international-trade/>

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