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Wholesale Central Bank Digital Currencies in Asia: Current Status and Motivation

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This article provides an overview of the current status and key features of wholesale central bank digital currencies (wCBDCs) in various Asian economies and also underscores the potential benefits and challenges associated with wCBDCs.

Asia is more developed than any other region in terms of the development of wholesale central bank digital currencies (wCBDCs). In 2021, the professional business services firm, PricewaterhouseCoopers (PwC), ranked the CBDC projects of Hong Kong and Thailand as the most advanced in the world.[1] wCBDC projects carried out in these economies are in the most advanced stage.

Other Asian countries, such as China, India, Indonesia, Japan, and Singapore, are exploring wCBDCs as well. They expect that wCBDCs can improve the speed and efficiency of large-value financial transactions. The current overreliance on world currencies, such as the U.S. dollar and the euro, in cross-border transactions has also motivated the efforts of some Asian economies, such as China, to develop a wCBDC-based system as an alternative. This current dependency is easily quantified. As of 2021, 60% of global foreign exchange reserves were held in U.S. dollars compared with 4% for the Chinese renminbi. The U.S. dollar had a 38% share as a global payments currency in comparison with the renminbi's 2%.[2] Estimates suggest that between 2015 and 2020, about 80%–90% of exports from large developing countries in Southeast Asia were exchanged using U.S. dollars.[3]

This article looks at the current status and key features of wCBDCs in Asia. While retail options for CBDCs

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also exist, many countries, such as the Philippines, determined that these retail solutions may be less appealing given the existence of a variety of digital payment solutions.[4] This article also gives special consideration to the potential role of wCBDCs in facilitating cross-border transactions. Policy makers in many Asian economies expect that wCBDCs will help eliminate the roles of various intermediaries and reduce the current reliance on world currencies, greatly benefitting their economic development.

WCBDC: DEFINITION, FUNCTIONS, AND BENEFITS

A wCBDC is a digitized central bank liability designed for interbank transactions with its access often limited to key financial institutions.[5] Digital central bank money has been used for many decades for wholesale transactions among banks.[6] These "currencies" often exist in the form of commercial bank deposits with the central bank, which are mainly used for maintaining reserve requirements and making large-value payments.[7]

What distinguishes the new CBDC initiatives is the use of blockchain and distributed ledger technology (DLT). These technologies allow central banks, as well as other entities, to maintain and hold access to ledgers used for wCBDC transactions.[5] Unlike traditional digitized central bank liabilities, a distinguishing feature of blockchain and DLT is that these technologies make it possible to tokenize "bearer instruments" in wCBDC transactions, meaning that the ownership status of a token's holder is recorded on a distributed ledger. Changes in ownership are available for all participating members of the distributed ledger system to verify.[5]

To better understand the benefits of wCBDCs, it is worth noting that the current interbank settlements involving non-CBDC systems are slow and inefficient. For instance, in Thailand, while the clearing and settlement of interbank transfers in the Bangkok metropolitan area would normally take two days, the process for interprovincial checks can take seven to fourteen days. Paper-based documents required for the clearing and settlement are moved using the courier systems.[8]

The digital currency issued by a country's central bank is stored in electronic accounts that are maintained by the central bank. Market participants, such as financial institutions, that have such accounts can hold the digital currency and transfer it to other accounts.[9] Such systems can improve the speed and efficiency of large-value financial transactions, such as those involving interbank settlements.

wCBDCs can also be programmed, giving them the ability to support automated transactions and restrict other types of transactions, such as the use of government benefits. CBDCs have the possibility of programming the money by tying it with different types of end users, such as farmers, small businesses, and low-income people.[5] For example, India's central bank, the Reserve Bank of India, has noted that CBDCs can be programmed so that government benefits, such as agriculture credit, can be used only at input store outlets to purchase agricultural input such as seed, fertilizer, land, and machinery.[10] In this way, fraud such as the misuse of agricultural funds can be prevented.

THE STATUS AND KEY FEATURES OF WCBDCs IN SOME ASIAN ECONOMIES

Asian economies are characterized by heterogeneous initiatives in wCBDCs. While economies such as Hong Kong and Thailand are at an advance phase of implementing wCBDCs, most economies in the region are only in the research phase of CBDCs.[11] In Table 1, we present the current status and key features of wCBDCs in selected Asian economies.

China

While a major focus of China's CBDC initiatives has been to increase the retail use of digital yuan, also referred to as digital currency electronic payment (DCEP) by the public,[12] the country has also made substantial efforts to increase wCBDCs' use in the domestic market and in cross-border transactions. Since 2021, China has worked with the Bank of International Settlements (BIS), as well as with Hong Kong, Thailand, and the UAE, to develop the Multiple CBDC (m-CBDC) Bridge project. This project involves the use of wCBDCs in international transactions. The goal is to make sure that the four economies' wCBDCs are interoperable. The m-CBDC Bridge project uses a platform based on a blockchain called the m-Bridge Ledger, which supports real-time, peer-to-peer (P2P) cross-border payments and foreign exchange transactions using CBDCs.[13]

India

India launched a pilot project involving wCBDCs through the Digital Rupee–Wholesale on 1 November 2022. The initial use case was limited to the settlement of secondary market transactions in government securities.[14] The country's nine major banks had been identified for participation in the pilot.[15] India's central bank, the Reserve Bank of India, noted that based on the findings from the first pilot, future pilot projects that would focus on other types of wholesale transactions and cross-border payments would be launched.

Indonesia

In November 2022, the central bank of Indonesia, Bank Indonesia, announced its plans for a digital rupiah. The plan consists of three stages: a basic wCBDC, a more advanced wCBDC, and a retail CBDC.[16] The digital rupiah's wCBDC version is expected to use a permissioned blockchain network. However, observers have noted that it is unlikely for the retail version to make use of blockchain due to scalability challenges.[16] According to the white paper Project Garuda, which aims to explore the optimal design for Indonesian CBDC, or digital rupiah, the central bank could designate entities other than commercial banks as wholesalers of the

digital rupiah. Wholesalers will have the authority to distribute the future retail digital rupiah. The central bank will oversee all the wholesale transactions.[17] A major goal of the wCBDC is to provide the basis for a retail CBDC.[16]

Singapore

In November 2022, the Monetary Authority of Singapore (MAS) launched a program, referred to as Ubin+, to test the use of wCBDCs in settling cross-border transactions involving foreign exchanges. A goal of the program is to study issues related to business models and governance structures in the settlement of cross-border foreign exchange. The project would also explore technical standards and infrastructure required to support currency transactions using DLT, as well as non-DLT-based infrastructures. The MAS has also teamed up with the Federal Reserve Bank of New York's New York Innovation Center to carry out a joint experiment called Project Cedar Phase II x Ubin+. The goal of the project is to investigate wCBDCs' potential roles in improving the efficiency of cross-border wholesale payments that involve multiple currencies.

By leveraging wCBDC as a settlement asset, Project Cedar Phase II x Ubin+ is expected to improve atomic settlements in cross-border cross-currency transactions.[18] Atomic settlements are settlements that are both simultaneous and instant (that is, two assets are exchanged so that one asset's transfer occurs only if the other asset's transfer also occurs).[19] The effort entails establishing connectivity across multiple currency ledgers. A major goal is to reduce settlement risks.[18]

Thailand

The Bank of Thailand started research and development on DLT in 2018.[7] By 2020, four proofs of concept (PoCs) on wCBDC had been completed: 1) domestic wCBDC; 2) Inthanon Phase I and Phase II, which involved the country's eight commercial banks; 3) cross-border wCBDC Inthanon–LionRock by teaming up with Hong Kong Monetary Authority (HKMA); and 4) wCBDCs for companies involving supply chain financing.[20] The findings of the PoC suggested that DLT has the potential to provide some payment functionalities at the interbank and cross-border levels. DLT can help produce trust among commercial banks and central banks. DLT can easily support wholesale interbank transactions, which are often large-value transactions but lower in volume.[7]

The country is also directing efforts toward implementing wCBDCs in cross-border fund transfers. As noted above, since 2021, the Bank of Thailand has been working with the BIS and the central banks of four other economies to develop the m-CBDC Bridge project.

REVOLUTIONIZING CROSS-BORDER FUND TRANSFERS WITH WCBDCS

Some governments in Asia have recognized an important role that wCBDCs can play in addressing the current barriers in cross-border fund transfers, such as high cost, inefficiencies, and complex regulatory compliance. Perhaps the m-CBDC Bridge project discussed above is the most notable wCBDC project in the region involved in cross-border fund transfers.

TABLE 1. wCBDCs in selected Asian economies: Current status and key features.

Country	Status of wCBDC	Key features
China	Substantial efforts to increase wCBDCs' use in the domestic market as well as in cross-border transactions.	Working with the Bank of International Settlements, as well as with Hong Kong, Thailand, and the UAE, to develop the Multiple CBDC (m-CBDC) Bridge project.
India	November 2022: Pilot in Digital Rupee–Wholesale was launched.	Initial use: Settlement of secondary market transactions in government securities.
Indonesia	November 2022: The Central Bank of Indonesia announced a digital rupiah plan consisting of three stages: a basic wCBDC, a more advanced wCBDC, and a retail CBDC.	Entities other than commercial banks may be designated as wholesalers. A major goal: provide the basis for a retail CBDC.
Singapore	November 2022: The Monetary Authority of Singapore (MAS) launched Ubin+ to test the use of wCBDCs to settle cross-border transactions. The MAS has also teamed up with the Federal Reserve Bank of New York's New York Innovation Center to carry out Project Cedar Phase II x Ubin+.	Exploring technical standards and infrastructure to support currency transactions using DLT as well as non-DLT-based infrastructures.
Thailand	By 2020: Four proofs of concept (PoCs) on wCBDCs completed (domestic wCBDCs, Inthanon Phase I and Phase II, Inthanon–LionRock, and wCBDCs involving supply chain financing). Since 2021: Participating in the development of the m-CBDC Bridge project.	Findings of the PoCs: DLT can provide some payment functionalities at the interbank and cross-border levels.

In December 2019, the HKMA and the Bank of Thailand completed the first phase of the project, Inthanon–LionRock. Eight Thai banks and two Hong Kong banks participated in the project to test the feasibility of digital currency-based transactions between Thailand and Hong Kong. PwC noted that the project Inthanon–LionRock, initiated by the two economies' central banks, the Bank of Thailand and the HKMA, was the most advanced wCBDC project in terms of the design and development. The project focuses on CBDCs' application in cross-border payments.[1]

In the second phase, the People's Bank of China (PBoC) and the Central Bank of the UAE joined the project, and the project was renamed as m-CBDC Bridge. The platform works as a bridge that allows multiple CBDCs to move digitally across national boundaries. The BIS Innovation Center in Hong Kong runs the pilot.[21]

The m-CBDC Bridge project is likely to make cross-border fund transfers more efficient. For instance, a participating county can negotiate with the central bank of each of its trading partners to establish exchange rates and develop legal frameworks among their currencies. The project is likely to develop as a cross-border corridor network for financial institutions. In the current open market, each country needs to buy other local currencies from intermediaries and pay a premium. m-CBDC Bridge can offer a more competitive foreign exchange rate than the open market to attract more central banks to the network.[22]

The m-CBDC project conducted a pilot between 15 August 2022 and 23 September 2022, which was facilitated by the Bank of Thailand, PBoC, HKMA, and Central Bank of the UAE. The pilot was reported to successfully demonstrate interoperability among the four jurisdictions' wCBDCs.[23] Twenty commercial banks participated. They transferred US$22 million in more than 160 CBDC-based transactions involving foreign exchange and cross-border payments for their corporate clients.[23] The payments were recorded in a customized m-Bridge Ledger platform, which was hosted on a centralized cloud based in Hong Kong. The participating banks carried out real-time P2P transactions. The respective central banks authorized and used CBDCs.[23] The participants' plan is to make the project more decentralized from technological and governance perspectives.[22]

Moving to a different issue, at a central bank conference in the United States in 2019, the Bank of England's head suggested the world to create a CBDC-based trading system to reduce the U.S. dollar's global dominance.[21] This is exactly what the governments of China and some other economies are envisioning. They have expressed an interest in developing a network of wCBDC-based cross-border payment systems to diminish U.S. influence over intraregional trades.[5] Such a system could work as a contingency plan for China and other countries if the United States prevents them from using the Society for Worldwide Interbank Financial Telecommunications (SWIFT) and the U.S. private clearinghouse for large-value transactions. The experiences of countries such as Iran indicate the severity of financial sanctions. For instance, in 2012, the United States-imposed sanctions on Iran were expanded to restrict exports and the country's access to global financial system such as the SWIFT. It was reported that the Iranian public felt the impact of the 2012 SWIFT/banking sanctions more acutely and severely.[24] A wCBDC-based cross-border payment system can increase China's preparedness to deal with trade conflicts with the United States and to be ready with countermeasures in case of U.S. monetary sanctions.[25]

China has taken a broad range of measures to reduce its dependence on the U.S. dollar. For instance, in September 2020, Indonesia and China signed a memorandum of understanding to promote local currencies rather than world currencies, such as the U.S. dollar and the euro. A key goal was to make the direct exchange rate quotations and interbank trading between the Chinese yuan and the Indonesian rupiah possible.[26] China is the biggest trade partner of Indonesia and a key source of foreign investment.[27] Since Indonesia is also developing the digital rupiah's wCBDC version, bilateral trade and investment between the two countries can be conducted in Chinese yuan and the Indonesian rupiah instead of in the U.S. dollar and euros.

UNLOCKING THE POTENTIAL OF WCBDCS IN ASIA

Asian economies are characterized by a high degree of heterogeneity in the development of wCBDCs. wCBDCs' adoptions are likely to have a powerful impact on cross-border transactions involving Asian businesses. For instance, the m-CBDC Bridge is expected to increase the efficiency of China's international trade and supply chains. The interoperability of DCEP with other tokens can allow Chinese companies and their foreign trading partners to move money across borders without depending on the U.S. dollar as an intermediary. To achieve the DCEP's global adoption, China has also started working with trading partners and financial hubs to develop platforms that facilitate the digital yuan's technical, legal, and financial interoperability with other countries' digital currencies.

It is important for policy makers to understand that a number of benefits can be derived from blockchain-based wCBDCs. For instance, the use of blockchain ensures that transactions are visible and accessible to multiple participants, which prevents double spending and counterfeiting. It is also possible to settle transactions instantly and at any time of the day. Blockchain may also improve cross-border and cross-currency transactions by eliminating the need for intermediaries such as correspondent banks and clearinghouses and reducing the dependence on major world currencies. Blockchain-powered wCBDCs can be programmed so that

transactions are settled automatically when certain predefined conditions are fulfilled. As envisioned by countries such as Indonesia, it is also possible to designate nonfinancial corporations as wholesalers of CBDCs.

To realize these benefits, policy makers in Asia must plan in terms of technical and personnel resources to implement wCBDCs. They may also turn to multilateral financial institutions, such as the International Monetary Fund (IMF) and the World Bank, in developing such resources. In the case of the Philippines, for instance, the IMF has offered technical help and is expected to be involved in providing wCBDC-related training to the staff of the central bank of the Philippines, Bangko Sentral ng Pilipinas.

Yet, several challenges need to be confronted if blockchain-powered wCBDCs are developed and deployed. For instance, wCBDCs could be vulnerable to cyberattacks. Due to a high degree of transparency of blockchain transactions, there are concerns about privacy and traceability of payments.[28] The adoption of WCBDCs therefore requires a complex regulatory framework for data privacy and consumer protection. The existing legal tools, such as anti-money-laundering regulations, need to be reassessed considering the adoption of wCBDCs.

Important decisions must be made regarding banking and nonbanking participants that can access central bank money for wholesale transactions. It is important to understand the different benefits that can be derived using wCBDCs in the settlement of different types of assets.

Overall, the various benefits discussed above underscore the importance of developing and launching wCBDCs for Asian economies. However, as in so many policy making questions, there is no one-size-fits-all answer in wCBDCs. The features and capabilities to be included in wCBDCs are functions of the benefits policy makers envision from this form of money and specific problems and challenges they want to address. If the policy goal is to strengthen neglected economic sectors such as agriculture, the programmable feature is important to ensure that these sectors receive the allocated fund.

If the goal is to reduce the reliance on major currencies such as the U.S. dollar in international trade- and investment-related activities, it is crucial to work in close collaboration with major trading and investment partners so that their wCBDCs have compatible features. To achieve the objective of establishing a foundation for the development of a retail CBDC, on the other hand, it is crucial to identify the relevant entities capable of shaping the choices of individuals and organizations when it comes to embracing a retail CBDC. These identified entities should be incorporated into the framework of wCBDCs.

Asia has emerged as a leader in the development of wCBDCs, with Hong Kong and Thailand's projects notably advanced. These wCBDC initiatives aim to enhance the efficiency of large-value financial transactions and reduce reliance on dominant world currencies. Collaborative efforts such as the m-CBDC Bridge project seek to create an interoperable wCBDC network for more efficient cross-border transactions. The adoption of blockchain offers benefits like transparency and security but also presents challenges such as cybervulnerabilities and privacy concerns. Policy makers must make key decisions regarding participant inclusion and wCBDC features tailored to specific policy goals, recognizing that there is no one-size-fits-all approach. In summary, Asia is at the forefront of wCBDC development, revolutionizing cross-border financial transactions.

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