OUR HONG KONG FOUNDATION
團結香港基金

Central Bank Digital Currency: The Cornerstone of Digital Financial Infrastructure

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Executive Summary

Central Bank Digital Currency (CBDC) is a legal tender issued by central banks in digital form. It serves as a direct cash-like claim against the central bank, which means that CBDC is a liability of the central bank and therefore free of counterparty credit risk. In simple terms, CBDC is similar to digital cash. It merges the stability of currency as a medium of exchange and a unit of account with the convenience of digitalisation, which allows for swift and contactless payments between users. More importantly, CBDC also enables countless avenues for innovation that existing digital payment methods lack, such as offline payments and programmable features.[1]

By and large, CBDC can be categorised into two types: retail CBDC and wholesale CBDC. While retail CBDC is mainly designed for the general public's day-to-day payments, wholesale CBDC is designed with financial institutions in mind, facilitating rapid interbank payments and cross-border settlements. And while retail CBDC provides the public with the most advanced payment methods, wholesale CBDC provides the bedrock on which to upgrade existing financial infrastructures. In pairing the "smart" with the efficient, both forms function together to pioneer a new era of digital finance.

As of today, 86% of the central banks around the world are conducting CBDC-related research, with China's digital renminbi, referred to as "e-CNY" below, acting as the trailblazer for many others. Among those exploring the possibility of issuing CBDC are developed economies such as the United States, the United Kingdom, Japan, France, and Switzerland. Hong Kong, as the world's traditional international financial centre, is not lagging on this front either. The Hong Kong Monetary Authority (HKMA) conducted their wholesale CBDC research project in 2017 and has recently launched their retail CBDC project in 2021.

This report is structured into three different areas: retail CBDC, wholesale CBDC, and governance, offering seven recommendations in total (Table I). This report aims to explore how Hong Kong can take full advantage of the opportunities offered by CBDC and assume a leading role in the new era of digital finance.

The primary application areas for retail HKD CBDC, referred to as "e-HKD" below, lies on the local level. Before all else, Hong Kong should first formulate a comprehensive and overarching retail payment strategy to optimise the daily payment experience of citizens **(Recommendation 1)**.

Table I. **Report structure**

	Local	Cross-border
Retail CBDC	**Recommendation 1:** Formulate a retail payment strategy	**Recommendation 3:** Dual-currency digital wallets
	Recommendation 2: Explore implementation strategies and use cases for e-HKD	
Wholesale CBDC	**Recommendation 4:** Explore use cases for wholesale CBDC in the financial industry	**Recommendation 5:** Develop Hong Kong into a wholesale CBDC hub
Governance	**Recommendation 6:** Formulate digital finance strategies	
	Recommendation 7: Establish a joint steering group for CBDC	

[1] CBDC can set specific rules for its usage through its programable features, such as limiting the scope for use and setting an expiration date.

To do this, the HKMA should seek to better understand the public's demand for CBDC through various means, such as public consultations; moreover, in order to meet the public's increasing demand for more convenient payment methods, relevant authorities should also work to ensure the interoperability between CBDC and the existing payment systems (e.g., Faster Payment System).

Guided by a clear retail payment strategy, Hong Kong should begin to explore local implementation strategies and use cases for e-HKD **(Recommendation 2)**. To list but a few strategies, the formulation of public-private partnerships should be considered when deciding the implementation strategy for e-HKD. The HKMA might also consider working with existing prevalent digital payment companies, such as the Octopus Cards Limited, to promote its usage. Regarding application scenarios, Hong Kong can refer to the Mainland's pilot of e-CNY and begin introducing CBDC from simple application scenarios such as government subsidies, slowly moving towards more complex application scenarios. This gradual approach would aid the adoption and popularisation of e-HKD.

In addition to local applications, e-HKD can also help facilitate cross-border payments. To offer greater convenience, Hong Kong should cooperate with the Mainland to launch a dual-currency digital wallet which has both e-CNY and e-HKD for cross-border commuters that travel between the Mainland and Hong Kong **(Recommendation 3)**. This dual-currency digital wallet can be first piloted in the Guangdong-Hong Kong-Macao Greater Bay Area, improving the financial interconnectedness and capital flow between the two economies in the long run.

With regards to wholesale CBDC, an important application will be the local financial industry; Hong Kong should explore its usage within existing systems to encourage process optimisation **(Recommendation 4)**. To achieve this, Hong Kong should refer to the successful pilots of Switzerland and other economies to promote the application of CBDC in exchanges, as well as improve and automate the whole delivery and payment process. In addition to the Hong Kong Exchanges and Clearing Limited, other digital asset exchanges in the private sector also have the potential to play an important role in the digitisation of Hong Kong's financial system.

At the cross-border level, the application of wholesale CBDC should revolve around the m-CBDC Bridge project.[2] Hong Kong should leverage its first-mover advantage and take the initiative in leading the standard-setting and governance of m-CBDC Bridge, connecting m-CBDC Bridge with the CBDCs of other economies **(Recommendation 5)**. In the future, the foreign exchange and cross-border application of e-CNY is projected to be at the core of m-CBDC Bridge. Hong Kong should give full play to its existing advantages as a major global intermediary to promote both the exchange between e-CNY and other CBDCs, as well as the internationalisation of renminbi.

Lastly, in terms of governance, Hong Kong should formulate a comprehensive digital finance strategy **(Recommendation 6)**, to establish a legal framework conducive to "disruptive innovation", as well as explore the potential risk factors associated with various newly introduced technological components, thus ensuring a smooth transition towards digital finance. At the same time, the HKMA should collaborate with the Financial Services and the Treasury Bureau to set up a CBDC joint task force **(Recommendation 7)**, maximising the advantages offered by CBDC in both Hong Kong's financial and economic systems.

A new era of digital finance is forthcoming, with CBDC being an integral part of this modern age. As the world's traditional international financial centre, it is imperative for Hong Kong to make full use of its numerous advantages to facilitate the development and implementation of CBDC, with a view on ushering in a new era of digital finance for the city.

[2] In February 2021, the HKMA announced the launch of the m-CBDC Bridge project. Based on the collaborative project between the HKMA and the Bank of Thailand in 2017 on cross-border application of CBDC, m-CBDC Bridge announced the addition of two new members: the Digital Currency Research Institute of the People's Bank of China and the Central Bank of the United Arab Emirates, to further explore the application of wholesale CBDC for cross-border payments.

86%
of central banks worldwide are currently conducting CBDC related research

36 central banks are now exploring both retail and wholesale CBDC

30%
of central banks have changed their stance on CBDC since the outbreak of COVID-19

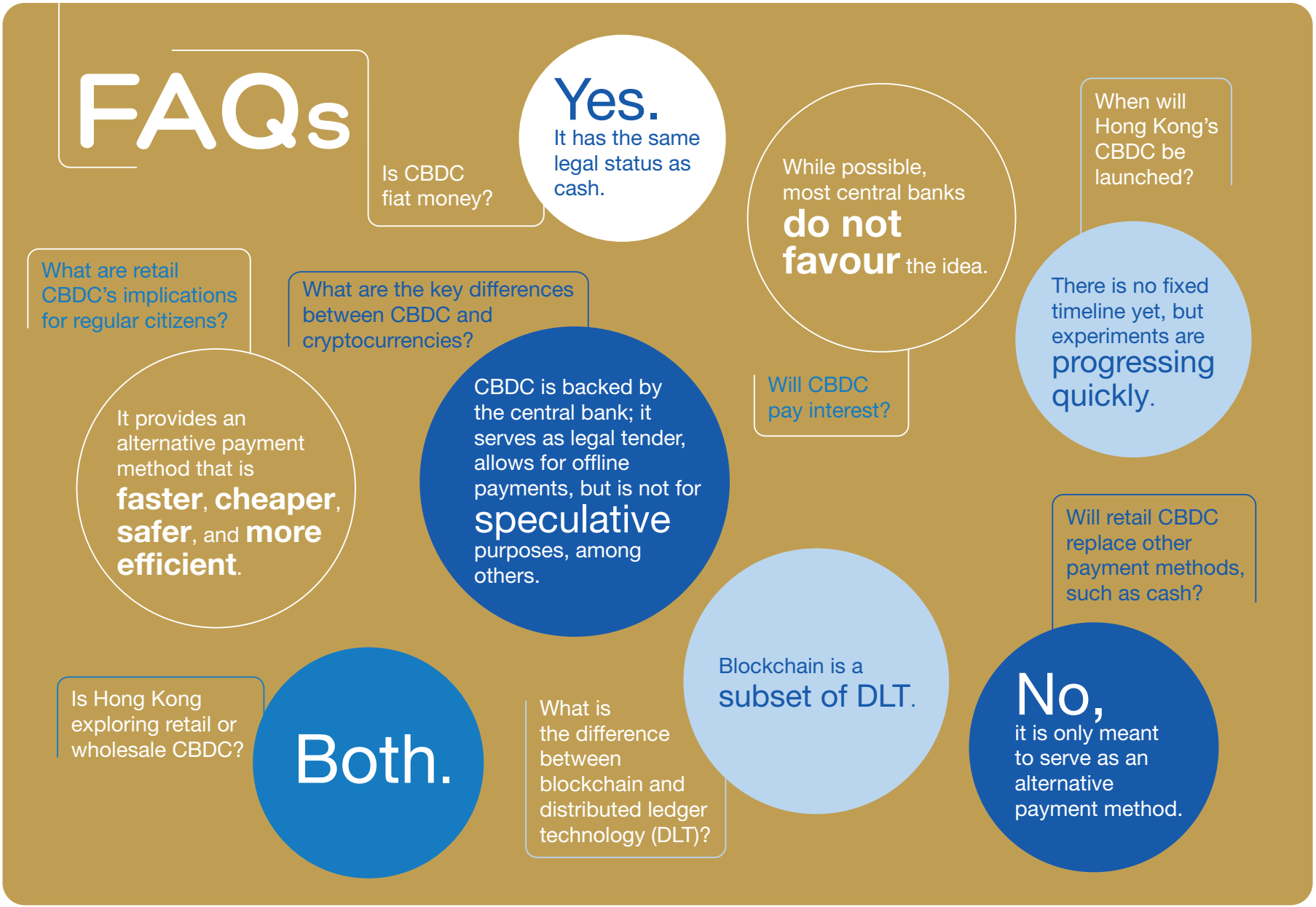
1st
live retail CBDC: **Bahamas' Sand Dollar**

The average cost of cross-border transactions is **7%** and CBDC can help reduce this

Retail CBDC is likely to be used by **1/5** of the world's population in the next three years

There are currently **10,000+** types of cryptocurrencies with market capitalisation equivalent to **1.45%** of global equities

1/3
of adults worldwide do not have a bank account, and CBDC can help improve financial inclusion


FAQs
Is CBDC fiat money?
Yes.
It has the same legal status as cash.
While possible, most central banks do not favour the idea.
When will Hong Kong's CBDC be launched?
There is no fixed timeline yet, but experiments are progressing quickly.
What are retail CBDC's implications for regular citizens?
What are the key differences between CBDC and cryptocurrencies?
Will CBDC pay interest?
It provides an alternative payment method that is faster, cheaper, safer, and more efficient.
CBDC is backed by the central bank; it serves as legal tender, allows for offline payments, but is not for speculative purposes, among others.
Will retail CBDC replace other payment methods, such as cash?
Is Hong Kong exploring retail or wholesale CBDC?
Both.
What is the difference between blockchain and distributed ledger technology (DLT)?
Blockchain is a subset of DLT.
No,
it is only meant to serve as an alternative payment method.

Central Bank Digital Currency: Pioneer of digital finance

The coronavirus disease (COVID-19) has changed our traditional ways of life, with "contactless" becoming the latest buzzword, and business models becoming increasingly digitalised. The concept of CBDC is thus growing in appeal to the general public. In June 2021, the Hong Kong Monetary Authority announced that they will begin a study on e-HKD, including its use cases, risks, and benefits.

CBDC is legal tender issued by the central bank in digital form. Traditionally, deposits in banks or digital wallets are liabilities of private companies, and therefore present a certain degree of credit risk to end users. On the contrary, CBDC provides a direct cash-like claim against the central bank, which means that CBDC is a liability of the central bank and therefore free of counterparty credit risk. This is an important difference between CBDC and private sector cryptocurrencies such as Bitcoin and Facebook's "Diem".[3] (Table 1)

Table 1. Comparison between CBDC and other types of currencies[4]

	Example	Anonymity	Traceability	No credit risk	Offline payment
Cash	Notes, coins	✓	✘	✓	✓
Bank deposit	Debit card	✘	✓	✘	✘
E-money	Alipay, Wechat Pay	✘	✓	✘	✘
Digital currency by private companies	Bitcoin, Diem	✓	✓	✘	✘
CBDC	**e-CNY, e-krona**	✓	✓	✓	✓

Sources: International Monetary Fund, Bank for International Settlements

There are two types of CBDC: retail CBDC and wholesale CBDC (Table 2).

- Retail CBDC is primarily designed for the general public, including households and businesses, and is an innovation on the payment front (retail Hong Kong dollar (HKD) CBDC is hereinafter referred to as "e-HKD").
- Wholesale CBDC is primarily designed for financial institutions, who are usually members of the existing Real Time Gross Settlement (RTGS) system. A key function of wholesale CBDC is to provide a new method for interbank settlements, especially for cross-border settlements (wholesale HKD CBDC is hereinafter referred to as "w-CBDC HKD").[5]

Table 2. CBDC classification

Retail CBDC	Wholesale CBDC
Designed for the general public	Designed for institutions, corporates, etc.
P2P, P2B, B2B	B2B

Description: "B" stands for "Business", "P" stands for "Peer", "2" stands for "to"
Sources: International Monetary Fund, Bank for International Settlements

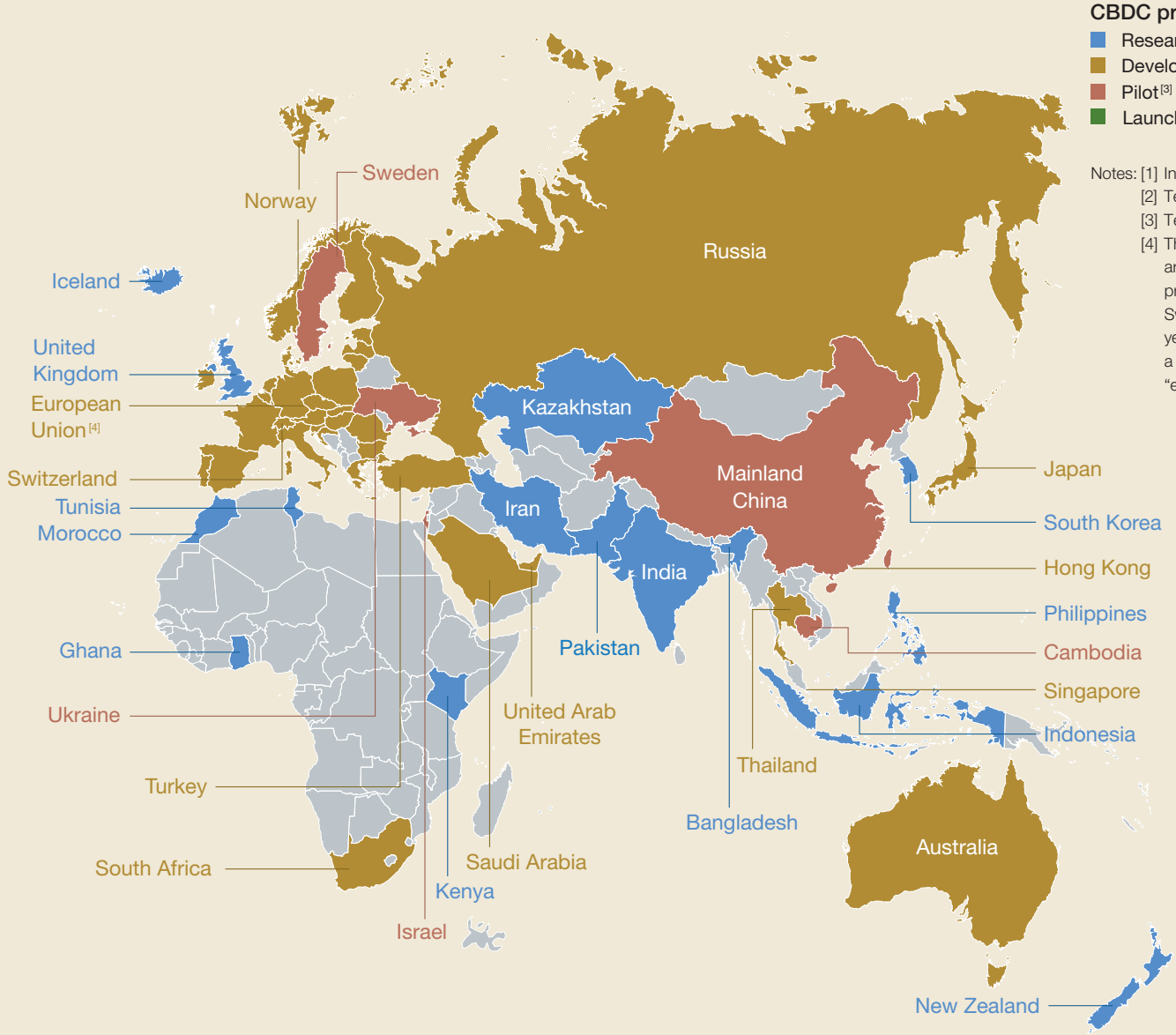
[3] Facebook's cryptocurrency project, formerly known as "Libra", was later renamed "Diem".
[4] How can it be both anonymous and traceable? Take digital RMB (e-CNY) as an example: e-CNY wallets are classified according to the level of customer identification. The lowest-privileged wallet has a lower maximum balance and transaction limit, but only requires a username and password to register and is completely anonymous. Higher-privileged wallets support higher balance and transaction limits. However, they require a higher level of customer identification such as identification cards to meet anti-money laundering requirements, and to allow for the transactions to be traced.
[5] The term "w-CBDC HKD" was referenced in the HKMA's Project Inthanon-LionRock report.

According to the latest survey by the Bank for International Settlements (BIS), 86% of central banks around the world are conducting CBDC research (BIS, 2021) (Figure 1). Major central banks such as the U.S. Federal Reserve and the European Central Bank (ECB) have announced plans to join the ranks of CBDC research. In addition to the surge in demand for contactless payments caused by COVID-19, the driving force behind the rapid development of CBDC can also be attributed to monetary sovereignty and financial inclusion purposes.[6]

Figure 1. **Research progress on CBDC worldwide[1]**

Sources: International Monetary Fund, websites of central banks of different countries, and media reports

[6] At present, about one-third of the adult population worldwide (1.7 billion people) have no access to banks and digital related financial services (The World Bank, 2017).

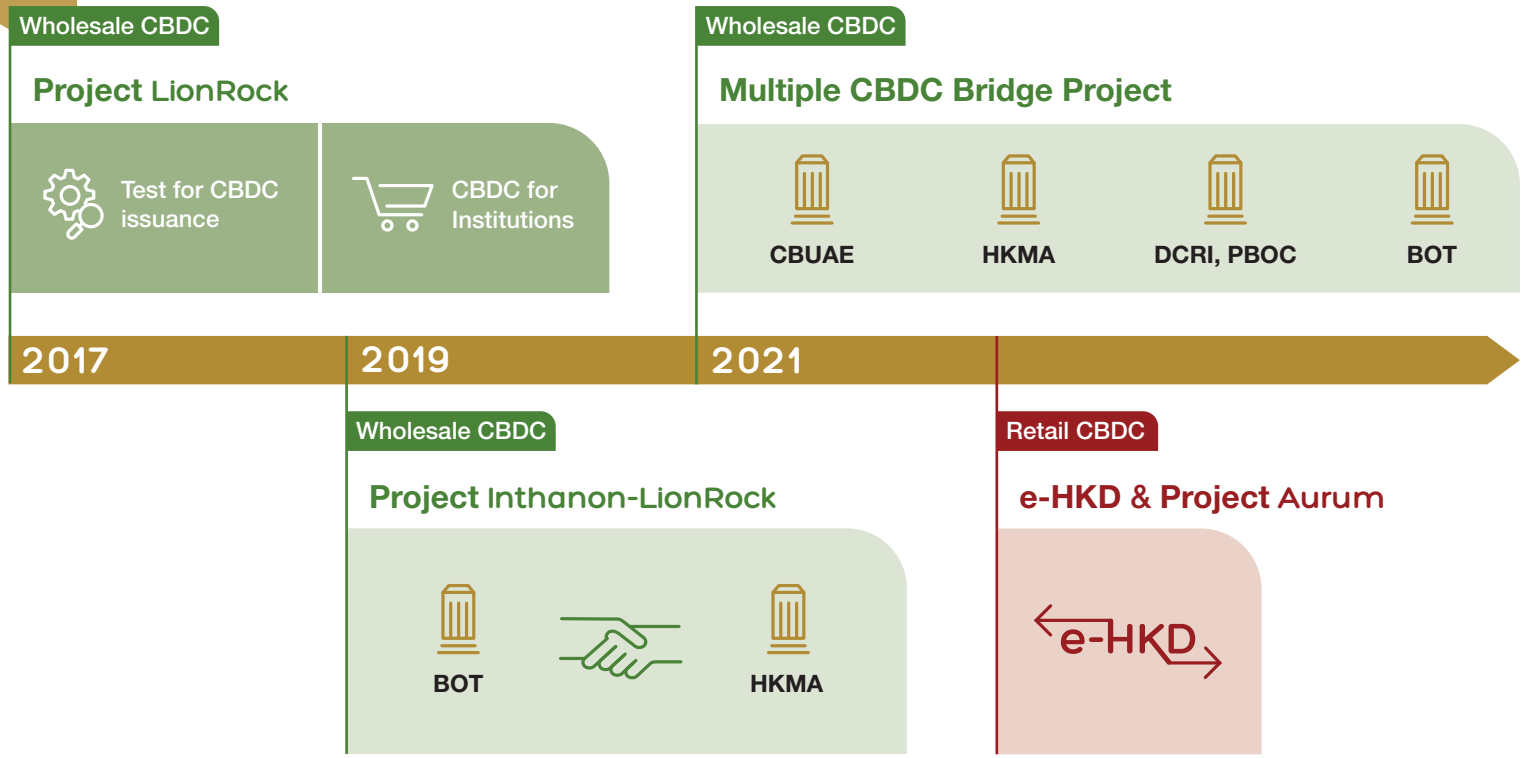

CBDC progress
Research
Development / testing[2]
Pilot[3]
Launch
Notes: [1] Information not exhaustive.
[2] Testing in internal, experimental settings.
[3] Testing in real-world scenarios.
[4] The research progress of EU countries are represented by ECB's "digital euro" project unless otherwise specified. e.g. Sweden is a member of EU but hasn't yet adopted the euro. Therefore it has a CBDC project for its own currency: "e-krona".
Norway
Sweden
Iceland
Russia
United Kingdom
European Union[4]
Kazakhstan
Switzerland
Mainland China
Japan
Tunisia
Morocco
Iran
South Korea
India
Hong Kong
Philippines
Ghana
Pakistan
Cambodia
Singapore
Ukraine
United Arab Emirates
Indonesia
Thailand
Turkey
Bangladesh
Australia
Saudi Arabia
South Africa
Kenya
Israel
New Zealand

Among the world's major economies, China is the front-runner in CBDC investigation. China began its retail e-CNY project in 2014 and has since entered the pilot phase. Currently, pilot scenarios include shopping, e-commerce, transportation, bill payments, government subsidies, and trial runs for the Winter Olympics. Although there is no fixed timetable for the official issuance of e-CNY, China has been preparing itself on multiple fronts, including implementation in the technology, legislation, and public engagement (Working Group on E-CNY Research and Development of the People's Bank of China, 2021).

At the same time, Hong Kong also has its own CBDC projects. In 2017, the HKMA conducted a wholesale CBDC research project titled Project LionRock to explore the application of CBDC at the B2B level (HKMA, 2020). Building on this, the HKMA and the Bank of Thailand (BOT) collaborated on a project titled Project Inthanon-LionRock in 2019 to test the feasibility of cross-border CBDC (BOT, HKMA, 2020).

In 2021, the HKMA, BOT, Central Bank of the United Arab Emirates (CBUAE), and the Digital Currency Research Institute (DCRI) of the People's Bank of China (PBOC) have jointly participated in the second phase of Project Inthanon-LionRock: Multiple Central Bank Digital Currency Bridge (m-CBDC Bridge). The project will further investigate the capabilities of distributed ledger technology (DLT) through the development of a proof-of-concept prototype to facilitate real-time, cross-border, 24/7 fully operational foreign exchange transactions in multiple regions. Additionally, cross-border business use cases in domestic and foreign currencies are also being explored. Another project of note is the retail CBDC Project Aurum, a collaborative project between the HKMA and BIS that explores different models for retail CBDC issuance. More recently, the HKMA also announced a new retail HKD CBDC project, which is the first time the concept of e-HKD has been put on the agenda, demonstrating that Hong Kong has ongoing, in-depth research projects on CBDC on both the retail and wholesale level. (HKMA, 2021) (Figure 2).

Figure 2. **Hong Kong's research progress on CBDC**



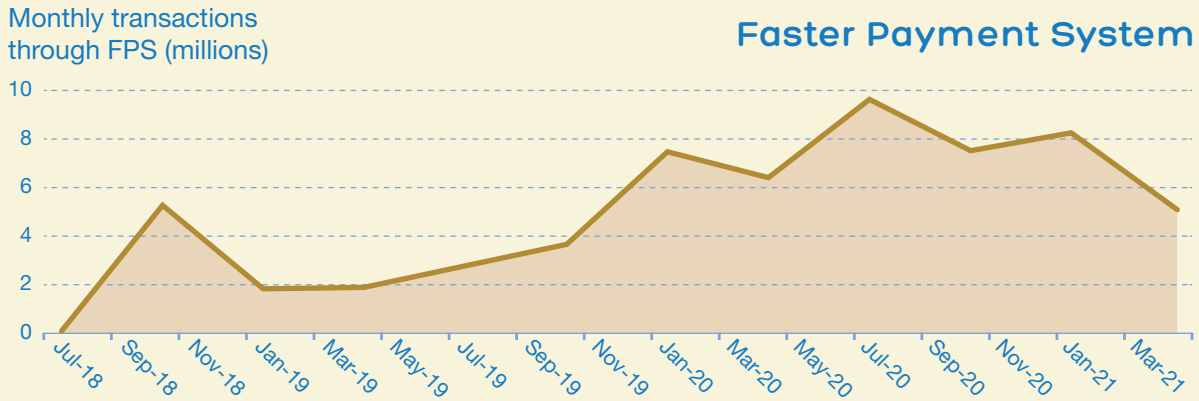
Sources: Hong Kong Monetary Authority, Bank of Thailand

CBDC is gaining momentum worldwide. With several ongoing CBDC projects, Hong Kong should seize this opportunity to become a leading pioneer in the digital era. **Retail CBDC will transform traditional retail payments, providing new conveniences for domestic and cross-border payments, while wholesale CBDC will enhance Hong Kong's competitiveness as an international financial centre. Additionally, the overseas application of e-CNY has also presented opportunities for Hong Kong to cement itself as the key node of the international CBDC network, and to transform itself into a digital financial centre.**

Retail CBDC: e-HKD brings a new era for retail payment

Digital payments have been gaining momentum since the beginning of the COVID-19 outbreak. According to the HKMA, the first quarter of 2020 recorded a 30% increase in Faster Payment System (FPS) users. In particular, the transaction volume in March 2020 saw a 60% increase from the previous quarter (Figure 3). Credit card company VISA also stated that it recorded a 10% growth in its e-commerce transactions in the first to second quarters of 2020. With a rising demand for digital payment methods, the development of retail CBDC is expected to bring great conveniences to the general public.

Figure 3. **FPS transaction volume since the start of COVID-19**



Source: Hong Kong Monetary Authority

At present, most of the digital retail payment methods in Hong Kong are provided by the private sector, such as traditional credit cards, Octopus cards, as well as e-wallets. The payment terminals usually charge a percentage of the transaction amount as a handling fee, which in turn discourages some retailers from offering digital payment methods. Therefore, the promotion of digital payments is often met with some degree of resistance.

The HKMA's launch of FPS in 2018 is an important innovation from the public sector to provide more cost-efficient retail payment methods. FPS does not impose any processing fees, which removes a key obstacle for merchants and individuals to adopt digital payments. Although the current utilisation rate of FPS among merchants remains relatively low, the rapid increase in FPS users amidst the pandemic demonstrates the importance of the public sector in providing digital payment methods.

As a public product, retail CBDC combines the benefits of cash and digital payments. The main differences between retail CBDC and existing digital payment methods are that retail CBDC is backed by the central bank, does not rely on bank accounts, whilst also enabling offline payments,[7] free cash withdrawal and programmability, among others. It represents a breakthrough for digital payments in terms of both technology and functionality, which will greatly enhance the performance and integrity of domestic digital payment systems (Table 3).

[7] CBDC allows for dual offline payments, meaning that neither the payer nor the recipient needs a network to make payments.

Table 3. Hong Kong's digital payment systems

Private Sector Examples of transaction fees	
PayMe	**For merchants** • 1.2% fee per business app transaction • 1.5% fee per transactions redirected from integrated websites or apps
Octopus	**For merchants** • 1.5% fee per transaction • HKD 200 per month for equipment rental • HKD 2,000 deposit
AlipayHK	**For consumers** (Credit card for Taobao shopping) • 1.5% fee per BOC credit card handling • 2.5% fee per other credit cards

Public Sector

Free of charge

FPS

- Increased P2P uptake, especially after COVID-19
- +30% new users in Q1 2020

e-HKD

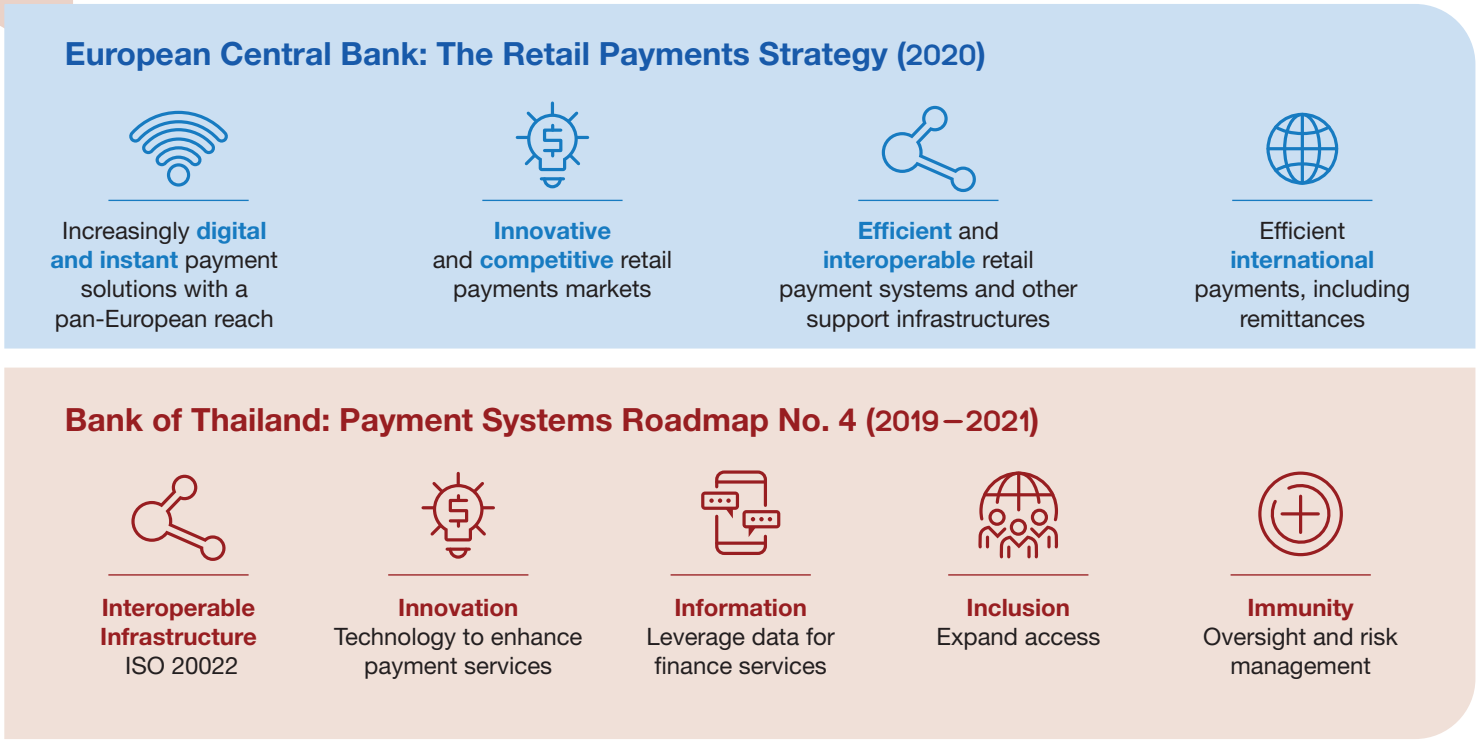
Programmable	Offline
Anonymous	Free cash withdrawal

New addition for a comprehensive retail digital payment system

Sources: Hong Kong Monetary Authority, various company reports

All major central banks around the world are improving and digitalising their payment systems. The central banks of the United States, Europe, Japan, Sweden, and Thailand have all begun investigations into retail CBDC, aiming to provide the public with a safer and more efficient retail payment method. Europe and Thailand have even formulated strategies to improve their retail payment systems (ECB, 2021) (BOT, 2019) (Figure 4).

Figure 4. **Europe and Thailand: Retail payment strategies**



Sources: European Central Bank, Bank of Thailand

Recommendation 1: Formulate a comprehensive and overarching retail payment strategy

In order to maximise the potential of retail CBDC, it is crucial for the retail CBDC system and existing retail payment infrastructure to interact and cooperate with each other. The HKMA should refer to the practices of the Eurozone and Thailand to formulate a retail payment strategy for Hong Kong, providing citizens with innovative, future-oriented retail payment methods. This strategy should cover different payment methods including CBDC and consider the various usage needs of citizens in different scenarios.

In this regard, there are four main areas to consider. Firstly, as a new payment method, the success of e-HKD is highly dependent on public adoption. In July 2021, the PBOC released a White Paper on the Progress of Research and Development of e-CNY in China, which sets out the background, objectives, design, and policy considerations of e-CNY, with the aim of seeking feedback from the public and strengthening communication with stakeholders. The ECB has also carried out substantial public engagement initiatives since the early stages of the digital euro (Figure 5), while the BOT has similarly conducted a public consultation on their retail CBDC, and has since decided to begin its pilot test in 2022. **The HKMA could take reference from different central banks in their approaches to promote retail CBDC, consulting the public and relevant professionals throughout various research stages to build public trust in e-HKD and design one that best meets market needs. An example would be either through a public**

Figure 5. **European Central Bank's public engagement for CBDC**

Source: European Central Bank
Note: [1] In July 2021, after the public consultation and a series of preparation work, the ECB announced to officially launch the investigation phase of a digital euro project, which will last 24 months.

consultation or stakeholder meetings which can be organised by the "Fintech Cross-Agency Co-ordination Group", which was established by the HKMA and various key industry players.

Secondly, ensuring interoperability between different payment methods is crucial for building a comprehensive payment system. The purpose of developing e-HKD is not to replace existing payment methods such as cash, Octopus, credit cards, and FPS, but instead to provide the public with an alternative payment method and to establish a faster and cheaper retail payment system. Therefore, **the HKMA should conduct in-depth studies to ensure interoperability between e-HKD and existing retail payment systems.** Indeed, the interoperability between e-HKD and the existing FPS will affect the ease with which citizens can use different retail payment methods.

Thirdly, **to promote continuous developments in the payment system, the HKMA should encourage the application of innovative technologies which will in turn encourage new business models. In this regard, the HKMA should focus on communication and cooperation with the private sector.** For example, the HKMA could explore the use of e-HKD in the medical system to streamline the entire process for patients, from paying medical expenses to insurance claims.

Lastly, the retail payment strategy should also include a systemic risk mitigation plan. Given the increasing popularity of digital payments, network and system security becomes a matter of utmost importance. **The HKMA should have a complete set of solutions to deal with various daily or unexpected system security issues; at the same time, it should also establish a new generation of efficient and robust payment systems that are in line with international standards.**

Recommendation 2: Explore implementation strategies and possible use cases for e-HKD

One of the quickest ways to promote widespread adoption of e-HKD is to work with the private sector, especially with the existing private digital payment systems that are already prevalent.

Potential private partners include Octopus Cards Limited and other e-wallet providers. For instance, there are now over 36 million Octopus cards and related products in circulation, with a penetration rate of over 98%, making it arguably the most popular digital payment method in Hong Kong.[8]

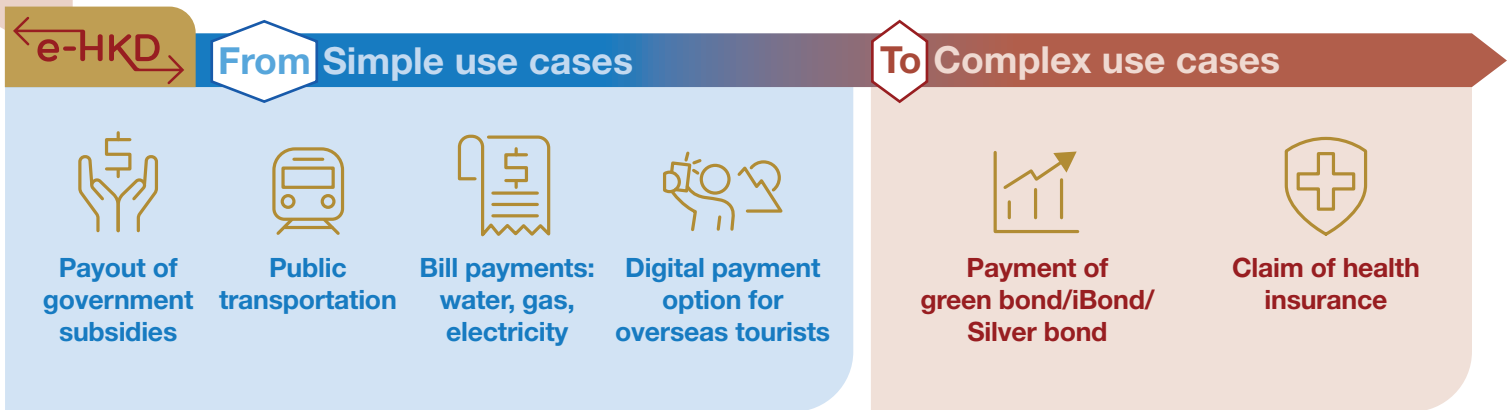
Octopus Cards Limited was founded in 1997 as the world's leading payment technology system; nowadays, however, its dated technology is finding it difficult to cope with an increasing demand for digital payments. In recent years, Octopus Cards has begun supporting FPS alongside other new digital payment systems. However, there have been occasional top-up system failures,[9] showing that the technology supporting Octopus Cards is not sufficiently compatible with the latest payment systems. Hence, the existing system needs to be upgraded. If the HKMA works with Octopus Cards Limited to promote e-HKD, it will not only promote e-HKD without having to change the payment habits of the public, but also help improve the payment system most widely used by the public.

[8] Octopus Cards processes 15 million transactions a day, amounting to over HKD220 million in value.

[9] In May 2021, approximately 2,000 users who used the FPS app to transfer money to their Octopus wallets had money deducted from their bank accounts without successfully topping up their Octopus wallets, and the system failed for around 10 hours.

In addition to implementation strategies, exploring use case scenarios is also an important step in ensuring the widespread adoption of e-HKD. **The HKMA should adopt a step-by-step strategy and maintain communication with relevant parties throughout the process. The HKMA should begin with simple scenarios to introduce different use cases of e-HKD to the public.** On the one hand, this is conducive to testing and consolidating the stability and security of the new system; on the other hand, it helps the public better understand the conveniences of using e-HKD (Figure 6).

Figure 6. **Exploring e-HKD, from simple to complex use case scenarios**



Source: Our Hong Kong Foundation

In the initial stages, the HKMA can refer to the Mainland's pilot of e-CNY and start with simple use case scenarios. Examples include usage in government subsidies, transportation payment, utility bill payment, and expanding payment options for overseas tourists.

According to a survey conducted by the BIS, 30% of central banks around the world have changed their attitudes towards CBDC since the outbreak of COVID-19 (BIS, 2021). The main reason behind this shift is the clear advantage offered by CBDC in distributing government subsidies. On the one hand, its digital form enables government subsidies to reach the digital wallets of targeted groups quickly and directly without intermediaries, minimising the risk of embezzlement. On the other hand, CBDC is programmable. This means that the government can design targeted subsidies in CBDC form such that it can only be used for specific consumption purposes, thereby maximising the policy intent of improving people's livelihoods whilst stimulating economic development during the pandemic. These characteristics also suggest that CBDC is suitable for distributing different types of government subsidies in the long run, which brings convenience to both the government and the public, killing two birds with one stone.

The latest application scenario of CBDC is to meet the digital payment needs of overseas tourists. Traditionally, tourists needed to either undergo currency exchange, or carry the currency of their destination with them in advance. In economies where digital payments are prevalent, such as China, many frequented areas only allow for digital payments. Foreign tourists therefore often encounter difficulty with regards to daily payments even if they hold cash. CBDC, in contrast, can directly facilitate the exchange between foreign currency and local CBDC via an ATM machine, which is convenient, fast, and free of risks such as counterfeit currency. The tourism industry has long been one of Hong Kong's pillar industries, and improvements to the tourist payment experience will be beneficial for the development of the local tourism industry.

In the long run, the HKMA can explore the uses of e-HKD in more complex scenarios such as the purchase and collection of interest from green bonds, as well as the automatic payment of medical insurance. A combination of CBDC's programmability features, alongside the latest technology applications such as smart contracts, can not only automate the distribution of bond interests, but also streamline the current insurance payment process to the greatest extent, thus simplifying the cumbersome document review and compensation process.

Recommendation 3: Dual-currency digital wallets

As of today, there exists a mutual desire between Hong Kong and the Mainland for a greater integration of their respective economies. While the main application of retail CBDC around the world is for domestic transaction purposes, Hong Kong can leverage the close economic ties it shares with the Mainland, utilising CBDC to facilitate cross-border retail payments.

Currently, however, there are different versions of e-wallets in Hong Kong and the Mainland, and the two are not interoperable. Indeed, residents of the two economies often face payment barriers when making cross-border transactions. In response to this issue, the DCRI of the PBOC and the HKMA conducted tests on the cross-border use of e-CNY in Hong Kong (HKMA, 2020), taking the first step towards using CBDC for facilitating retail payments between the two economies. Based on this successful experiment, **the HKMA should cooperate with the PBOC to launch a dual-currency digital wallet featuring e-CNY and e-HKD to facilitate cross-border consumption and payment by residents across the border. This digital wallet should have a currency exchange function to facilitate the conversion between e-CNY and e-HKD.**

Leveraging the programmable features of CBDC, this wallet can be first piloted in the Greater Bay Area (GBA), with a restriction on available cities, maximum balance, spending limit, or application scenarios to minimise the risk of the pilot. The cross-border application of CBDC will help promote capital flow within the GBA and encourage cross-border financial activities between the Mainland and Hong Kong in the long run, for example, the Mutual Market Access between the Mainland and Hong Kong.

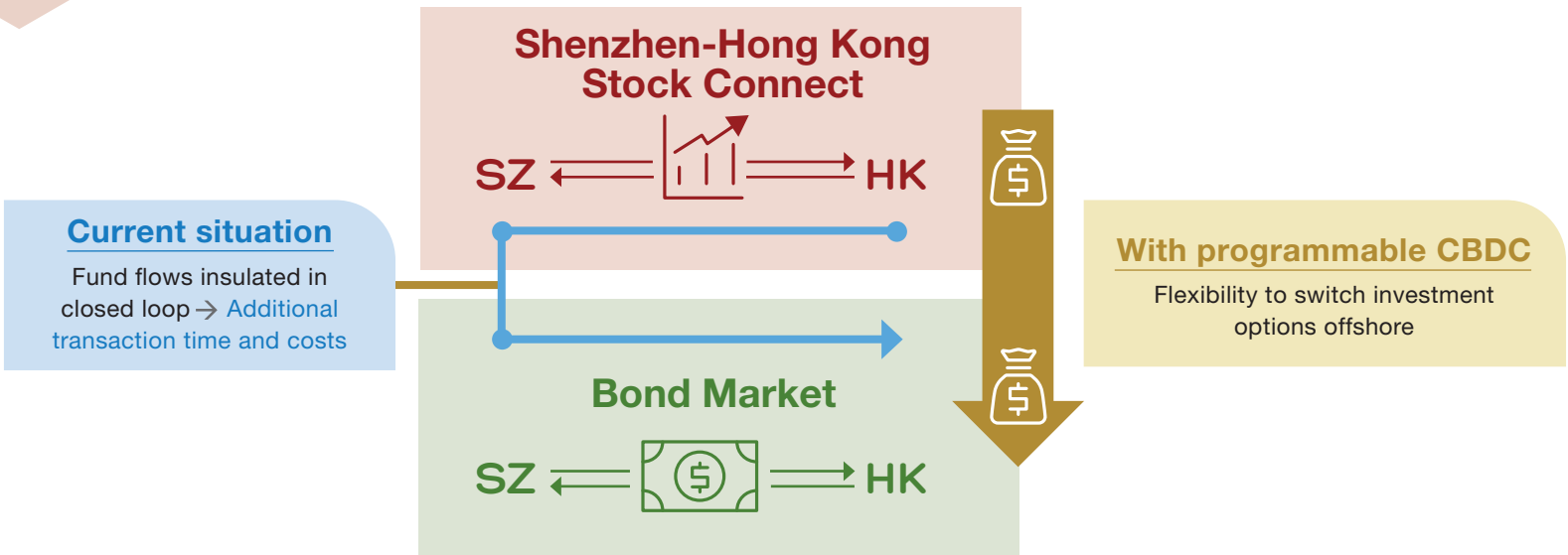
At present, the flow of funds under the Shenzhen-Hong Kong Stock Connect are insulated in a closed loop, where the funds from selling Stock Connect securities would first have to flow back to the original account before travelling cross-border again. In other words, if mainland investors intend to convert their stock investments from Hong Kong into bond investments, they must first sell their stocks and transfer the funds back to Shenzhen via Stock Connect, and then invest in Hong Kong's bond products via other channels. Under this mechanism, an additional round of cross-border fund transfer will not only incur unnecessary costs, but also risks making investors miss the best investment timing.

Programmable e-CNY is a potential solution to the problem. e-CNY can be designed to only allow for the purchase of selected types of Hong Kong investment products which are approved in advance, instead of restricting funds in a closed loop for a specific product category. As a result, mainland investors will have greater flexibility in their investments in Hong Kong while concerns from regulators over capital flight will also be addressed (Figure 7).

Additionally, the application of CBDC can also help promote "Wealth Management Connect".[10]

At present, remote account openings and the connection of financial infrastructure between the two economies are the main challenges faced by the Wealth Management Connect initiative. According to the consultation report from the *Cross-boundary Wealth Management Connect pilot scheme in Guangdong-Hong Kong-Macao GBA,* the northbound access mechanism of Wealth Management Connect has yet to allow for accounts to be opened remotely.[11] Amidst the pandemic and various quarantine measures, it has been increasingly difficult for Hong Kong investors to open an account in the Mainland in person, thus making the northbound

Figure 7. **CBDC promotes the mutual market connection in the Greater Bay Area**



Source: Our Hong Kong Foundation

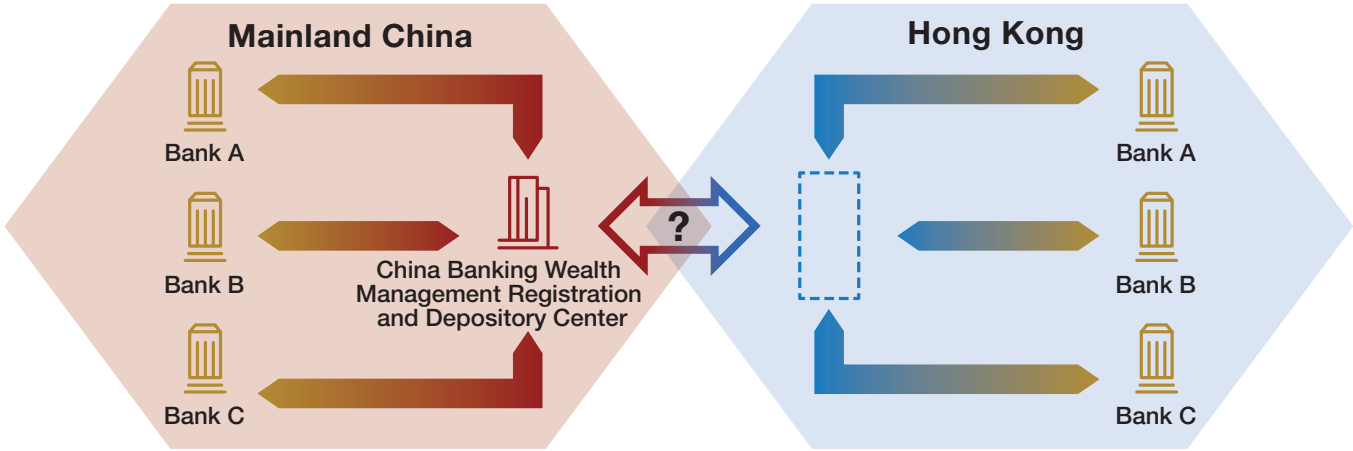
[10] "Wealth Management Connect" refers to the mechanism that allows GBA residents to invest in wealth management products sold by GBA banks. In May 2021, the implementation guidelines of Wealth Management Connect were drafted and the public was consulted.

[11] At present, Hong Kong residents can open deposit accounts in the Mainland remotely, but can only open investment accounts in the Mainland in person.

access mechanism less feasible. CBDC, particularly e-CNY, can help fulfill anti money laundering (AML) and know your customer (KYC) requirements. e-CNY wallets use a hierarchical classification design, where wallets differ in aspects such as transaction and balance limits based on the level of identity information provided. For investment purposes, a large amount of e-CNY would be required, implying the need for an equivalent level of relevant identity verification. In this case, CBDC can be integrated into the system to resolve the AML and KYC problems, so that northbound investors do not need to travel to the Mainland in person to open an account for purchasing wealth management products.

Regarding the connection of financial infrastructures, the Mainland has a financial management centre named China Banking Wealth Management Registration and Depository Center; its National Banking Wealth Management Information Registration System requires connection from all financial management systems of commercial banks. The Mainland's financial management system for banks is digitally integrated and has a unified management standard. In contrast, wealth management products in Hong Kong are independently operated by different banks. Their management standards are also different and there exists no corresponding system that can be connected with the Mainland. This makes it difficult to monitor the actual investment flow of cross-border funds, thus increasing the difficulty of connecting the financial infrastructures (Figure 8). If the two economies can utilise CBDC in the design of Wealth Management Connect, the programmable features of CBDC can be used to limit the purchase of wealth management products to pre-determined categories, thus ensuring that the funds are within a controlled, compliant scope of use.

Figure 8. **Challenges faced by the Wealth Management Connect mechanism**



Source: State Council of the People's Republic of China

Wholesale CBDC: Financial industry as the primary application area for wholesale CBDC

While the development of retail CBDC will bring convenience to the public, wholesale CBDC will serve as the core infrastructure for Hong Kong's transformation from a traditional financial centre to a digital financial centre. Digital finance integrated with innovative technologies such as blockchain will disrupt the current global financial ecosystem. To keep up with the times, it is essential to establish a future-oriented digital financial infrastructure. In the future, CBDC will work with digital asset exchanges, data platforms, digital identities, among others, to jointly support the digital finance system in the era of digital economies.

CBDC is a digital fiat currency. Like traditional currencies, CBDC needs to enter a suitable economic and financial system to fully fulfil its role, thus having different applications and use case scenarios that vary between economies. For Hong Kong, an international financial centre, the finance industry is undoubtedly the primary application area for CBDC, as the HKD and Hong Kong's financial industry have always shared a positive complementary relationship. The stability of the HKD provides a solid foundation for Hong Kong as an international financial centre, and the local financial industry in turn provides various application scenarios for the HKD to consolidate its status. Similarly, in the era of digital finance, the w-CBDC HKD and the digital financial industry will continue to create synergistic opportunities. The w-CBDC HKD will enhance Hong Kong's financial infrastructure and competitiveness as an international financial hub, while the development of local digital finance will in turn promote the use and adoption of w-CBDC HKD. Additionally, e-CNY will bring a unique advantage for the development of w-CBDC HKD which Hong Kong cannot afford to miss.

The use of wholesale CBDC in the financial industry can be divided into local and cross-border use cases.

Recommendation 4: Explore use case scenarios for wholesale CBDC in the financial industry

Exploring use case scenarios are a prerequisite to promoting w-CBDC HKD locally. As an international financial centre in close proximity to the Mainland, Hong Kong has a comparative advantage in the financial industry. Therefore, to press these advantages, the HKMA should cooperate with the financial industry to promote the application of CBDC. Let us take the exchanges as an example.

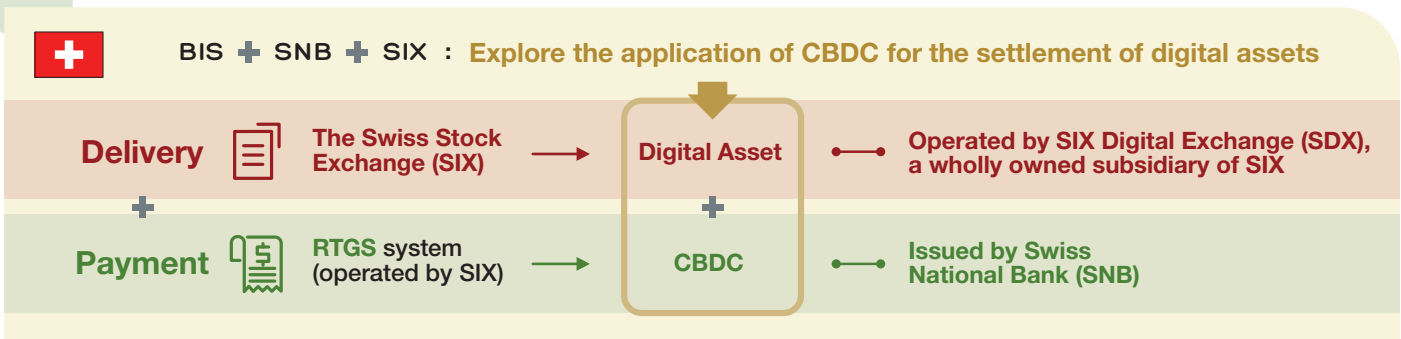
The settlement of securities is divided into two parts: delivery and payment. The delivery leg is responsible for transferring ownership of the securities, where the securities are transferred from the seller to the buyer. The payment leg is responsible for the settlement of the transaction funds, where the funds are transferred from the buyer to the seller. At present, the delivery and payment of securities on most stock exchanges are carried out separately via two systems. For example, the Central Clearing and Settlement System (CCASS) is a computerised book-entry clearing and settlement system for transactions in securities listed on the HKEX, which is responsible for the delivery of securities. At the same time, the Hong Kong Interbank Clearing Limited (HKICL) under the HKMA operates the RTGS system in Hong Kong, which is responsible for interbank payments. In order to improve the efficiency and reduce risks during the settlement process, CCASS has been linked with HKICL since 1998 for instant delivery versus payment (DvP) service for securities trading.

At present, CCASS and HKICL, which are responsible for the delivery and payment of securities in Hong Kong respectively, adopt an account-based model. An account-based model adopts a centralised management system, whereby accounts are managed by trusted centralised institutions, such as securities accounts which are managed by CCASS, and fund accounts which are maintained by HKICL. This entails a certain level of credit and settlement risk. At the same time, account-based models often collect detailed authentication information to facilitate the identification of accounts which also poses a risk to personal privacy. When and how a centralised organisation can reasonably and legally use this information is difficult to define in practice, and thus presents a problem.

However, DLT represented by blockchain presents new possibilities for improving the settlement process of securities. Based on blockchain technology, both delivery and payment systems for securities can utilise a token-based model. The delivery system for tokenised securities is conducted by virtual or digital assets,[12] whilst the payment system relies on the blockchain-based CBDC system. In this token-based model, an ideal system is designed to run delivery and payment systems for tokenised securities on the same blockchain platform. This system is designed to simplify the transaction process, reduce transaction costs, enable automated real-time DvP, reduce credit and settlement risk, and improve transaction transparency when compared to traditional account-based models. Furthermore, the use of technologies such as encryption on blockchain will greatly reduce privacy protection and data management issues associated with traditional account-based models.

The Swiss National Bank's Project Helvetia (BIS, SIX, SNB, 2020) successfully completed its proof-of-concept late last year, using CBDC for settlement on the SIX Digital Exchange (SDX) (Table 4). In the long run, the SDX plans to automate the entire trading process by offering issuance, listing, trading, settlement, and other services on a blockchain platform. Promisingly, Singapore's Project Benja applied this model to the bond market and successfully experimented using CBDC on a digital bond platform. The HKMA is also cooperating with the BIS on a project named Project Genesis to build a prototype digital infrastructure that enables green bonds and other investments. However, there has been no mention of CBDC in the scope of the project thus far.

Table 4. **Switzerland's Project Helvetia**



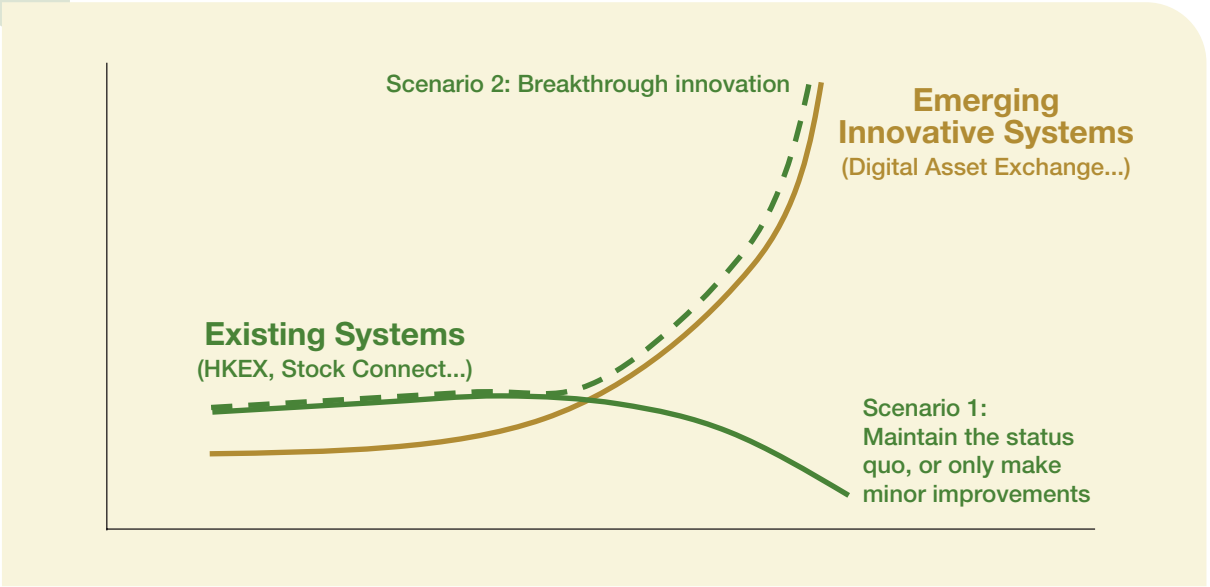
Sources: SIX Digital Exchange, Bank for International Settlements

[12] According to Financial Services and Treasury Bureau, "virtual assets" are defined as a digital representation of value that can be digitally traded, or transferred, and can be used for payment or investment purposes. This definition of "virtual assets" does not include CBDC, or financial assets regulated by the Securities and Futures Ordinance (Chapter 571) (such as securities and approved structured products). In this report, both "digital assets" and "virtual assets" are interchangeable as concepts.

Clayton Christensen, professor of business administration from Harvard university, has coined the term “disruptive innovation”. The term suggests that if existing market leaders do not continually innovate, there will inevitably be competitors in the market that launch cheaper, more accessible, and better products in the future, thereby attracting more users. This theory is applicable to the construction of financial infrastructures. If existing systems remain static, new systems that provide better products or services will inevitably emerge and make them obsolete. In regards to this, the establishment and development of new systems is often driven by the private sector.

There are two ways for Hong Kong to upgrade its existing financial infrastructure. The first is to improve the existing system; the second is through disruptive innovation via emerging competitors to establish new financial infrastructure. The two paths for innovation are not mutually exclusive, but if the existing system either maintains the status quo or only makes minor adjustments, it will very likely be overtaken or even replaced by competitors later on (Scenario 1). However, if innovative breakthroughs are made to the existing financial infrastructure, it could remain competitive and further Hong Kong’s position as a leading international financial centre (Scenario 2) (Figure 9).

Figure 9. **Transforming and upgrading Hong Kong’s existing financial systems**



Source: Our Hong Kong Foundation

The emergence of CBDC introduces the possibility of improving the existing system. The HKMA and HKEX should consider collaborating to connect the existing CCASS system of the HKEX with CBDC to improve the efficiency of the payment process (Table 5). CBDC's use case is not limited to HKD (w-CBDC HKD). Under the existing Dual Tranche Dual Counter[13] model of the HKEX, HKD securities are delivered in HKD, and RMB securities in RMB. To improve the Dual Tranche Dual Counter model, in addition to connecting the HKD CBDC system to the HKEX, connecting it with the e-CNY system is also crucial. This would help further enhance the efficiency and enrich investment options for offshore RMB, giving full play to Hong Kong's role as a bridge between the Mainland and international capital, attract more RMB investors, and consolidate Hong Kong's position as an international financial centre.

With regards to "disruptive innovators", or digital asset exchanges in the private sector, these participants should look to similar projects from Switzerland and Singapore for reference. As a goal, they should find ways to place the CBDC system on the payment leg and the digital asset system on the delivery leg, doing both on the same blockchain platform (Table 5). Within these emerging systems, the transformation of securities is no longer limited to post-trade settlements; the application of the latest technologies such as blockchain in the issuance, listing, trading, and other processes enable the tokenisation of the entire digital asset transaction process. These improvements should be combined with smart contracts to further automate the DvP process of the exchanges, allowing real-time settlement of transactions.

Table 5. Progressively promote the application of CBDC in exchanges

Exchanges \ Central Banks		Payment Leg	
		Account-based **RTGS system**	Token-based **Wholesale CBDC system**
Delivery Leg	Account-based **Traditional Asset**	Current system of HKEX CCASS + HKICL	Improve the system of HKEX CCASS **+ Wholesale CBDC system**
	Token-based **Digital Asset**		Digital asset exchanges (established by disruptive innovators or HKEX) **Digital asset system + Wholesale CBDC system**

Source: Our Hong Kong Foundation

[13] "Dual Tranche Dual Counter" means that the same stock can trade with two stock numbers using both currencies simultaneously. At present, the dual-currency shares listed on the HKEX include Shenzhen Investment Holdings Bay Area Development Co., Ltd., Harvest MSCI China A-share index ETF, and more.

In recent years, digital assets such as security token offerings (STO)[14] and non-fungible tokens (NFT) have become increasingly popular due to the emergence of "disruptive innovation", with the private sector serving as the driving force. This is largely because the private sector is not limited by the existing infrastructure, and therefore can make use of the latest technological breakthroughs to establish a new and transformative system.

In Hong Kong, regulators and relevant government departments have also noticed this development in the private sector and acted accordingly. For example, the Securities and Futures Commission (SFC) has issued relevant position papers and regulatory frameworks, whilst the Financial Services and Treasury Bureau (FSTB) has completed a public consultation on the licensing system for virtual asset service providers. At the end of last year, the SFC approved the first virtual asset trading platform licence, meaning that digital asset trading was officially incorporated into Hong Kong's regulatory system.

For emerging disruptive innovators, the challenge lies not in the motivation to innovate, but in how to promote the application and survival of innovative systems in existing markets. Critically, the CBDC system must function in tandem with digital asset exchanges to stimulate its development.

Presently, the digital asset exchange in the private sector and the HKMA's CBDC research project are undergoing independent developmental processes. Given that the incorporation of a CBDC system is crucial for digital asset exchanges to maximise the advantages of blockchain and other technologies, **the HKMA should include digital asset exchanges as part of its considerations when conducting research into CBDC; that is to say, it should open interfaces to digital asset exchanges at the point at which the CBDC project is ready for launch, linking digital assets systems to the payment platform for DvP.** Citing a similar case, the HKMA can look to the experience of the BOT[15] (BOT, 2021), which proposes that the CBDC system should permit the private sector to access its programmable features whilst supporting their usage. In allowing for the use of technologies such as smart contracts, the reality of fully automated transactions, as well as the prospect of real-time transaction settlements draws ever closer.

[14] Backed by assets, security tokens inherit the nature of traditional securities. In contrast, Bitcoin and other virtual tokens are backed by no assets, do not have the attributes of traditional securities, and are not within the scope of the report.

[15] In its CBDC research report, the Bank of Thailand recommends that the CBDC system open up programmable functions to the private sector to promote financial innovation and development.

It is important to note that blockchain platforms utilised by digital asset exchanges and the HKMA are unlikely to adopt a uniform system, which will lead to cross-chain issues when connecting the platforms together. Based on the aforementioned suggestions, **the HKMA should consider the interoperability of different platforms and systems when incorporating the CBDC system for digital asset exchanges, providing assistance where possible to ensure that the process is smooth, and that the system provides maximum efficiency.** HKMA could again draw reference from the BOT, which suggests that CBDC should be designed to be interoperable with digital asset platforms to the highest extent possible (BOT, 2021).

In actuality, the development of digital asset exchanges is not limited to emerging innovators. Current market leaders such as the HKEX can also look to innovate, and take advantage of new opportunities created by the development of digital asset exchanges. Indeed, major stock exchanges in Switzerland, Thailand and other economies already have established digital asset exchange subsidiaries to explore new possibilities brought about by digital asset trading. As such, Hong Kong's competitiveness in the era of digital finance can be greatly enhanced if both emerging innovators and existing market leaders collaborate to make joint breakthroughs.

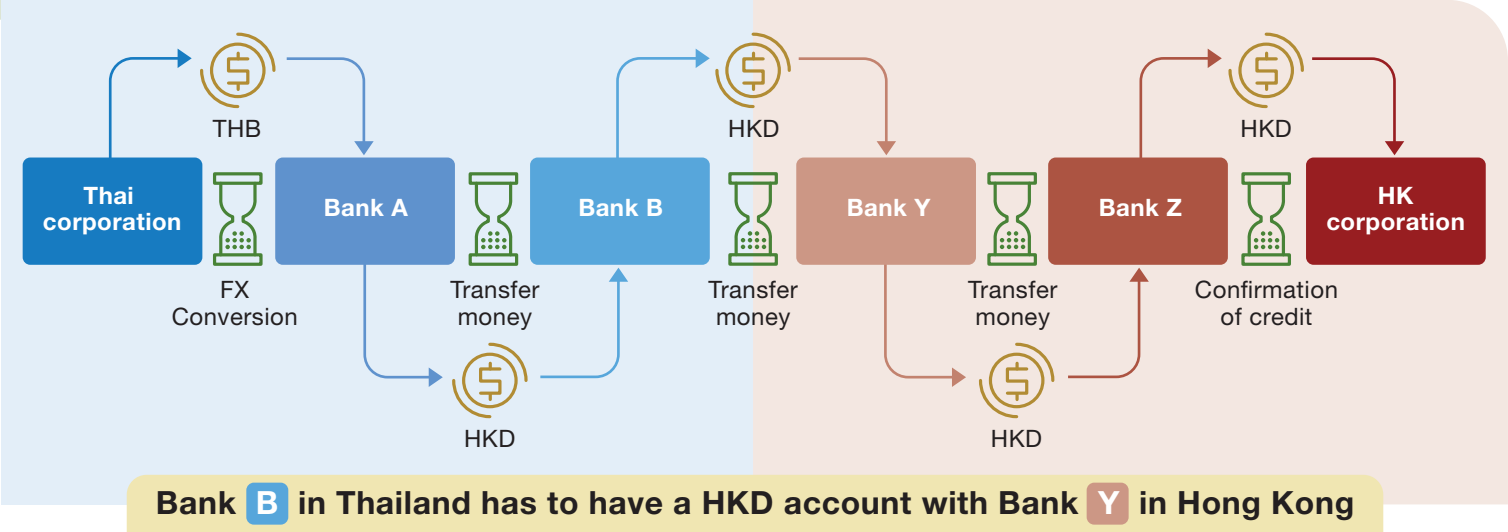
Looking ahead, the development of digital asset trading requires the coordination and cooperation of relevant stakeholders, with the interoperability of CBDC being just one part of the equation. Relevant regulators and stakeholders in Hong Kong should regularly pay attention to the development of the digital asset market; they should actively explore the restrictions and challenges faced by digital assets such as the scope of tradable assets, what constitutes a qualified investor, as well as market transparency. Additional thought should also be given to the formulation of a clear and up-to-date regulatory framework. Solving the above issues is crucial to the overall development of digital assets, and digital finance as a whole in Hong Kong. In this regard, we urge the relevant parties to conduct more in-depth discussion and research on this.

Recommendation 5: Develop Hong Kong into a wholesale CBDC hub

In addition to local applications, wholesale CBDC has significant potential for cross-border applications.

At present, international transactions generally adopt the correspondent banking model where commercial banks act as intermediaries to transfer money from the sender to the recipient (Figure 10). For a long time, such a model has been facing problems such as slow transactions, high cost, and low transparency. International organisations such as the G20 and the United Nations have set goals to improve the status quo of cross-border finance.

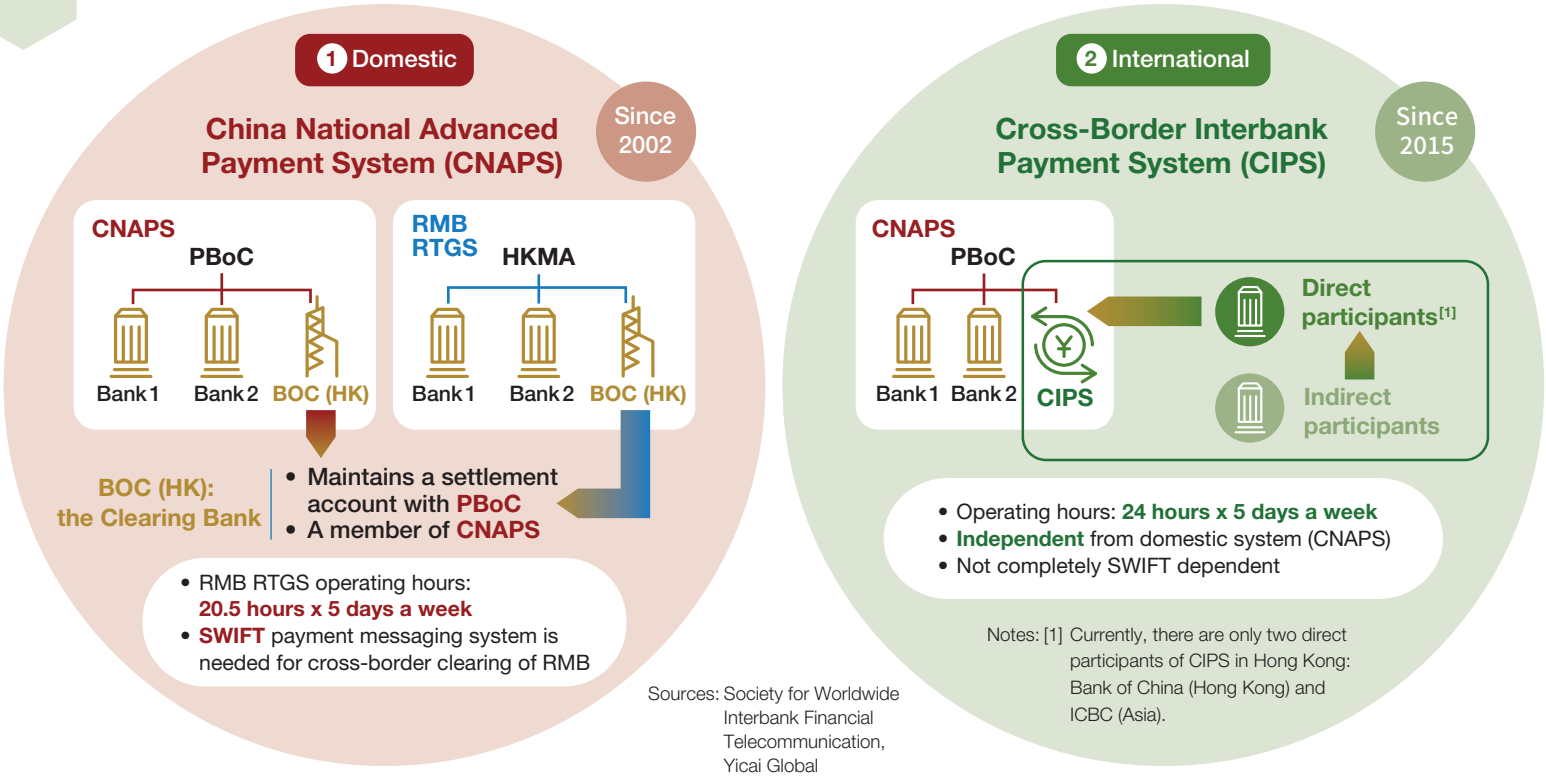
Figure 10. **Correspondent banking model for cross-border payments**



Sources: Bank for International Settlements, Hong Kong Monetary Authority, and Bank of Thailand

As of today, the clearing and settlement of offshore RMB needs to be completed with the help of intermediary agencies. The PBOC has two RMB clearing and settlement systems: one is the China National Advanced Payment System (CNAPS) which was introduced in 2002, and the other is the Cross-Border Interbank Payments System (CIPS) which was introduced in 2015 (Figure 11). Under CNAPS, the settlement of Hong Kong's RMB RTGS is done through the appointed clearing bank, Bank of China (Hong Kong). CNAPS relies on the SWIFT messaging network for cross-border RMB settlement, which means they do not have full autonomy over it. The newly introduced CIPS has established its own messaging network, but the utilisation rate is still relatively low. Although offshore banks are allowed to directly join CIPS, Hong Kong currently only has two direct participants within CIPS: Bank of China (Hong Kong) and ICBC (Asia). Other banks in Hong Kong must still depend on these two banks to complete offshore RMB settlements, which leads to problems such as long clearing paths and reduced efficiency.

Figure 11. **The existing RMB clearing and settlement system**

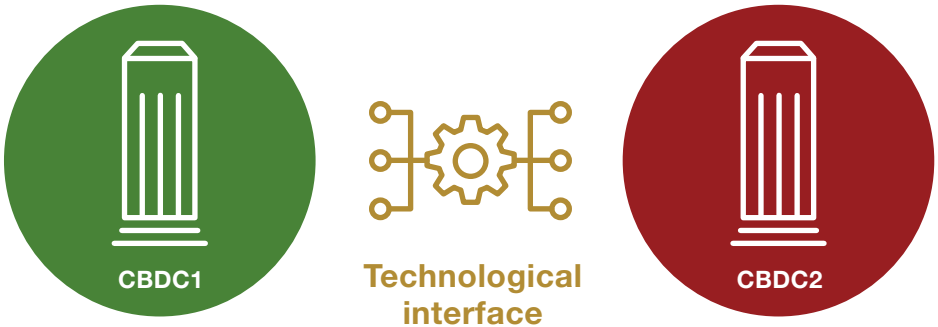


Sources: Society for Worldwide Interbank Financial Telecommunication, Yicai Global

Notes: [1] Currently, there are only two direct participants of CIPS in Hong Kong: Bank of China (Hong Kong) and ICBC (Asia).

The emergence of CBDC is expected to enable breakthroughs in the finance sector for wholesale cross-border applications. In the past few years, central banks of different economies have began trialling CBDC and blockchain technology to improve the efficiency of cross-border payments. The Interlinking model was one of the popular early models (BIS, 2021) (Figure 12). In this model, different central banks run highly independent domestic CBDC systems, and try to use a common technological interface to connect the systems. Examples of the interlinking model include Project Stella, a collaboration between the ECB and the Bank of Japan (BOJ), and Project Jasper-Ubin, a collaboration between the Bank of Canada (BOC) and the Monetary Authority of Singapore (MAS). However, this model faces issues such as how the technology platforms, operating rules, and participants vary by economy, making the coordination and smooth operation of this shared interface difficult. In the long run, it is unfeasible to build hundreds of interconnected interfaces worldwide if such links were to be established between every participant.

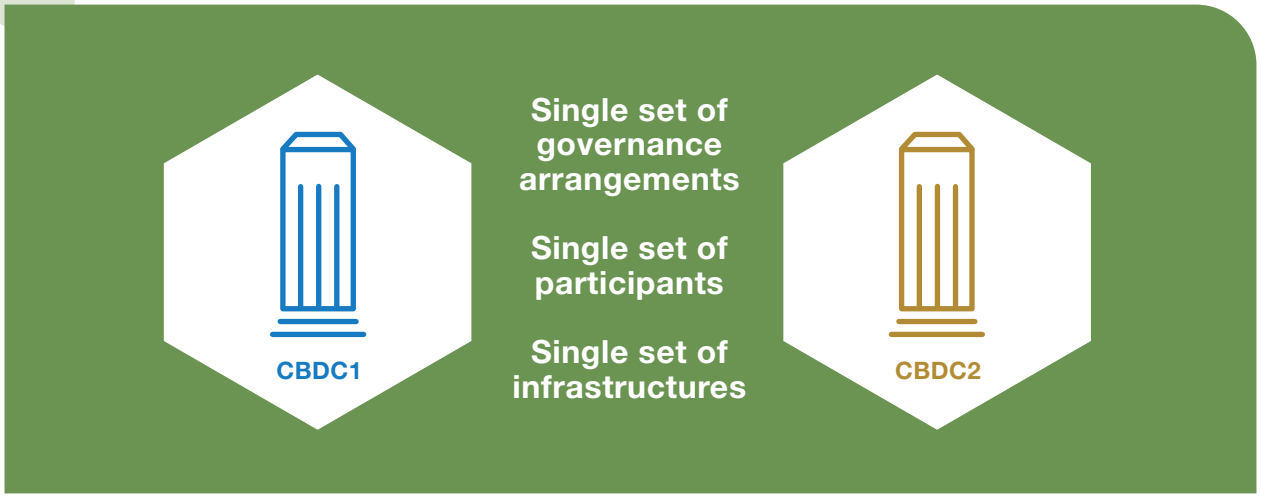
Figure 12. **Interlinking CBDC model**



Source: Bank for International Settlements

In contrast, Project Inthanon-LionRock, a collaboration between the HKMA and BOT, utilised the single platform model. In this model, the two central banks jointly establish and manage a blockchain platform for cross-border CBDC (BIS, 2021) (Figure 13). This platform has a unified governance structure, with the same group of participants, and the same set of operating systems, which largely solves the coordination and overall planning problems faced by the interlinking model.

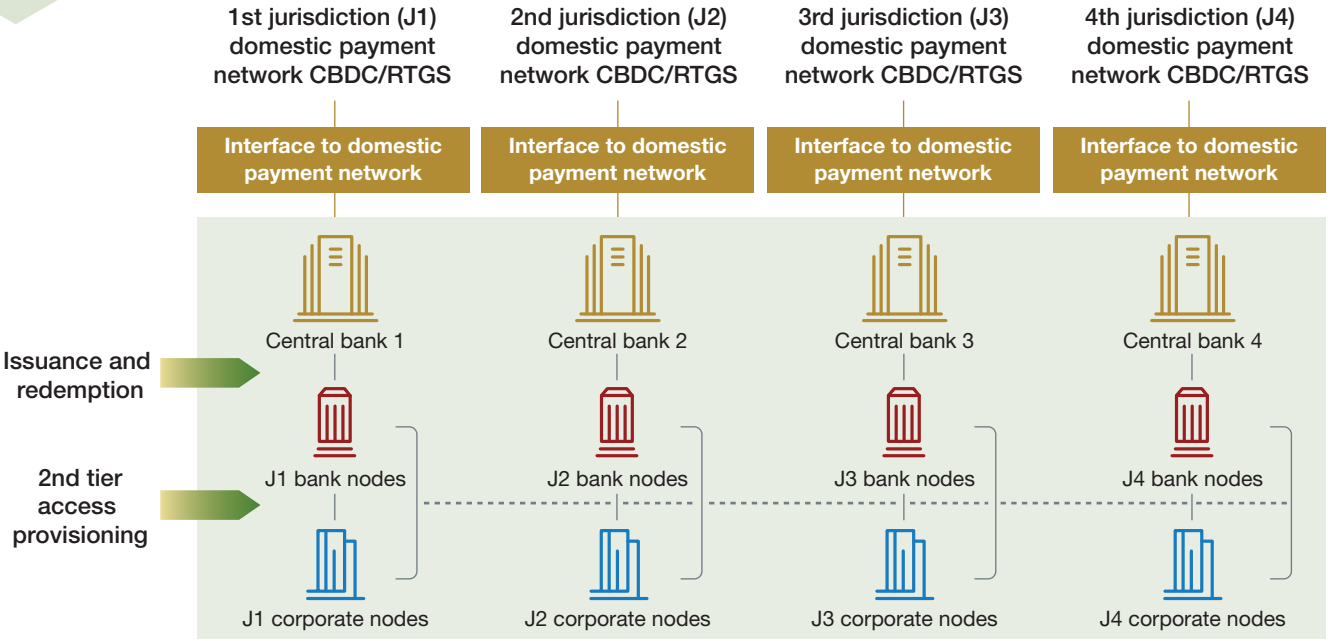
Figure 13. **Single platform CBDC model**



Source: Bank for International Settlements

Based on the single platform model established by Project Inthanon-LionRock, the m-CBDC Bridge has since added more participants in the hopes of exploring cross-border CBDC in more depth (Figure 14).

Figure 14. The design of the m-CBDC Bridge system

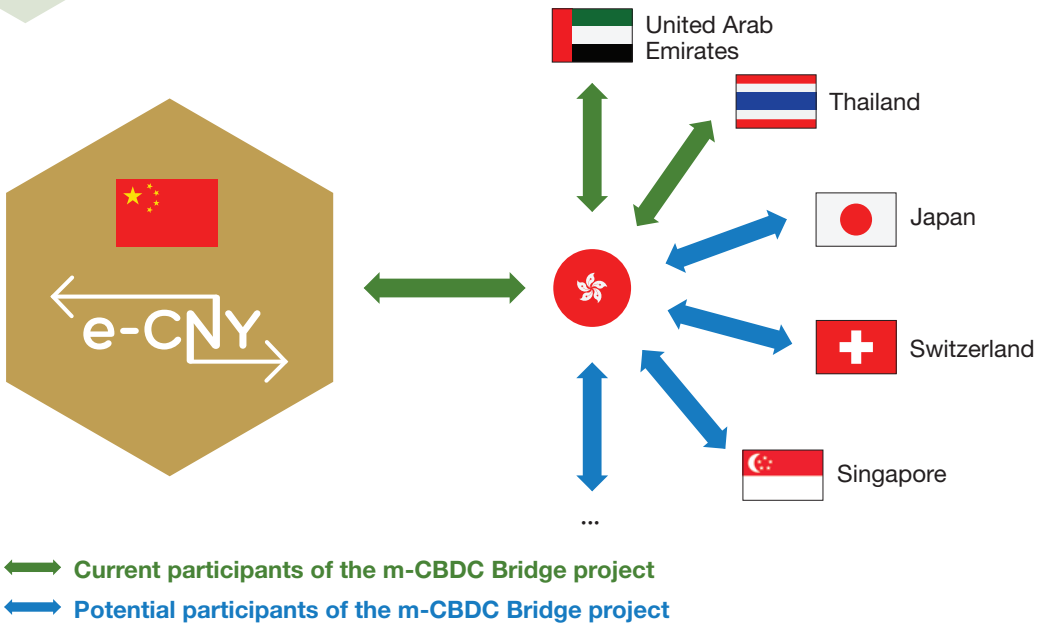


Source: Bank for International Settlements

As the world's fourth largest foreign exchange centre, Hong Kong should focus on positioning itself as an international foreign exchange centre for CBDC. **Hong Kong should take full advantage of its close ties with the Mainland and its first-mover advantage as one of the first participants in m-CBDC Bridge; it should actively participate in the governance of the corridor network, as well as the formulation of related rules. Hong Kong should also aim to develop itself into a regional or global CBDC hub by connecting w-CBDC HKD with other CBDCs** (Figure 15).

In addition to the UAE, BOT, and PBOC's DCRI, which have all joined m-CBDC Bridge, Hong Kong should invite other economies with relatively mature wholesale CBDC development, who at the same time share close economic ties with Hong Kong, to join m-CBDC Bridge. Examples of such economies include Singapore, Switzerland, and Japan.

Figure 15. **Develop Hong Kong into a wholesale CBDC hub**



Source: Our Hong Kong Foundation

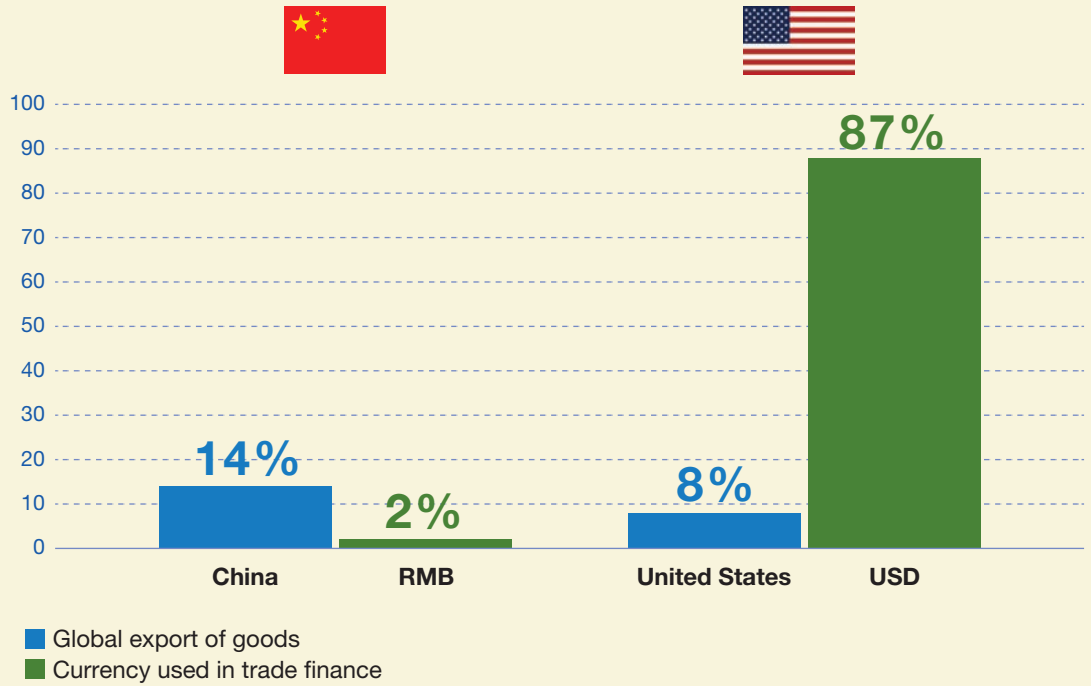
- Singapore's wholesale CBDC project, Project Ubin, has released five phases of research reports, with cross-border payments being the subject of the fourth phase (BoC, BoE, MAS, 2018). It is worth mentioning that the MAS is currently working with BIS on a project called Project Dunbar to explore cross-border CBDC platforms based on an unbundled technical solution stack. Singapore and Hong Kong already have a good foundation for cooperation in the application of new technologies such as DLT. For example, in 2017, the HKMA signed and exchanged a memorandum of understanding to develop the Global Trade Connectivity Network, linking Hong Kong's *eTradeConnect* and Singapore's *Singapore Networked Trade Platform*. In addition to inviting Singapore to join m-CBDC Bridge, the two monetary authorities can also exchange opinions or even explore cooperation between m-CBDC Bridge and Project Dunbar through the BIS to jointly promote the cross-border development of CBDC. Such cooperation would not only help relieve the current pain points of cross-border payments and remittances, but also unleash the potential of digital finance via CBDC as well as digital trade finance cooperation.

- Switzerland is at the forefront of exploring wholesale CBDC application scenarios. In addition to the above-mentioned Project Helvetia, Switzerland has also cooperated with the Bank of France on a project titled Project Jura to explore the application of wholesale CBDC in complex scenarios such as cross-border securities transactions (BIS, 2021). Switzerland joining m-CBDC Bridge will bring beneficial expertise and experience that deepens the investigation of application scenarios.

- Japan's CBDC development is progressing rapidly, having launched a one-year proof-of-concept in April 2021. Japan and Hong Kong have long shared a strong business relationship, with Japan being Hong Kong's fourth largest trading partner. Recently, the HKMA and BOJ also launched a cross-border link to support DvP settlement of the HKD sale and repurchase transactions using Japanese Government Bonds as collateral. Japan's addition to m-CBDC Bridge will further enhance the existing financial infrastructure and be of great benefit to the future cooperation between the two economies.

The use of e-CNY for overseas and cross-border exchange will be at the core of m-CBDC Bridge. At present, The United States accounts for 8% of the worlds export of goods, whilst the USD accounts for 87% of global trade finance. On the contrary, China accounts for 14% of the world's export of goods, but the RMB only accounts for 2% of global trade finance (Figure 16).

Figure 16. **Comparison between China and the United States in global export of goods and currency usage in trade finance (2019)**



Sources: Society for Worldwide Interbank Financial Telecommunication, World Bank Group

This sharp contrast shows that there is abundant opportunity for the RMB to develop as a trade settlement currency, but the internationalisation of RMB still has a long way to go. The development of CBDC, including e-CNY and the establishment of m-CBDC Bridge provide practical and convenient solutions to further the internationalisation of the RMB. The greater the number of economies and their respective currencies that join m-CBDC Bridge, the easier it will be for e-CNY to be used and exchanged overseas. With China's economy continuing to strengthen, the overseas and cross-border exchange of e-CNY provides an important use case application for m-CBDC Bridge, which in turn provides the financial infrastructure to support the internationalisation of the RMB. Against the backdrop of the PBOC's cautious promotion of e-CNY, Hong Kong should give full play to its existing advantage as a major global intermediary and explore opportunities to become an important transit platform for overseas exploration of e-CNY. This would further the RMB's internationalisation by promoting the exchange between e-CNY and other CBDCs.

Looking ahead, given the participation of various economies, m-CBDC Bridge can be linked to other mechanisms such as stock exchanges and blockchain trading platforms, which could give Hong Kong the potential to act as a bridge between the Mainland and international capital flow. At present, eTradeConnect, the blockchain trading platform under the HKMA, has successively collaborated with its counterparts in Singapore, Europe, and the Mainland to streamline trade processes and further promote trade digitalisation. m-CBDC Bridge can successively introduce these blockchain trading platforms that have already been connected to make full use of the project's outstanding advantages in currency exchange and remittance. Undoubtedly, this would help promote the development of trade finance with e-CNY at its core.

Whether it be retail or wholesale, CBDC is a crucial infrastructure that will support the digital financial ecosystem; importantly, it requires the coordination and cooperation of various parties within the financial industry. In a mature digital financial ecosystem, components such as CBDC, blockchain technology, digital asset exchanges, and data platforms are seamlessly interconnected and closely interact to promote the efficient operation of the entire system.

Recommendation 6: Formulate digital finance strategies

At present, most of the components in the digital financial ecosystem such as digital assets are in the early stages of development; however, most components work independently and lack a coherent strategy. An effective digital financial strategy would not only help clarify the future direction of various components, but also help coordinate their development in the early stages. As a result, this would lay a solid foundation for a comprehensive ecosystem, and maximise synergies produced by CBDC and other components.

The European Union's Digital Finance Strategy has formulated a comprehensive and systematic digital financial development blueprint that covers different areas such as digital financial infrastructure, legal and regulatory frameworks, as well as risk prevention and control (ECB, 2020). This strategy of the European Commission pays special attention to the interaction and cooperation between different departments to maximise the synergistic effect and establish an organic digital financial ecosystem. For example, this strategy includes a regulatory proposal that recommends providing legal certainty for the use of DLT in financial market infrastructure to conduct pilots, as well as prepare for the digital transformation of financial markets. The proposal also maps out a specific regular review and exit mechanisms to protect the rights and interests of investors, ensuring the overall security of the system. This proposal considers the regulatory obstacles faced by the application of new technologies such as DLT in the financial industry and the systemic risks that may arise during testing.

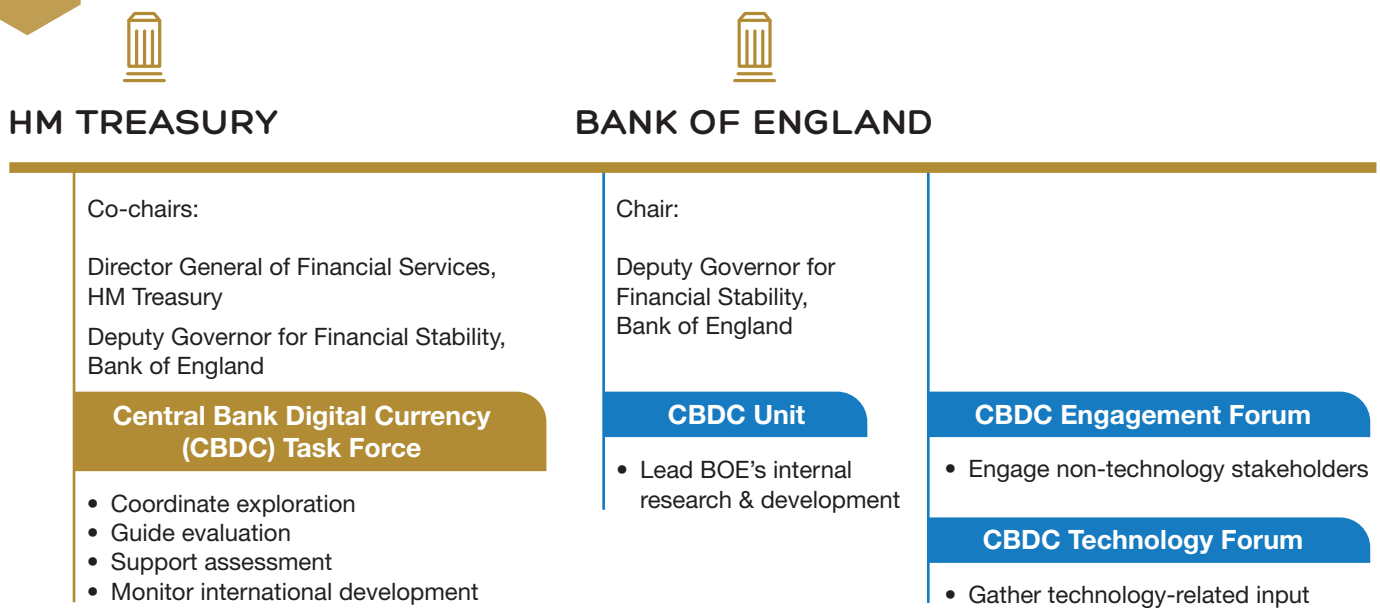
In terms of strategy formulation, Hong Kong is not without action. In June 2021, the HKMA announced its FinTech 2025 strategy, putting forward five focus areas such as improving financial infrastructure, talent training, and encouraging technology adoption in the financial industry (HKMA, 2021). Going forward, **the HKMA should consider the overall development of digital finance in Hong Kong and formulate a comprehensive digital financial development strategy. In particular, the HKMA should refer to the practices of the European Union, and consider aspects such as the legal and regulatory framework, risk prevention and control, and their interactions to promote the coordinated development of the ecosystem, among others.**

Recommendation 7: Establish a joint steering group for CBDC

Under the overall strategy of Recommendation 6, currency can only be truly effective when it is circulated in both the economic and financial system. The central banks of the United Kingdom and Japan have both established joint working groups in the early stages of their CBDC research to coordinate the entire process, including the development and exploration of use case scenarios (Figures 17 and 18). At present, an inter-departmental working group has been established within the HKMA to study e-HKD.

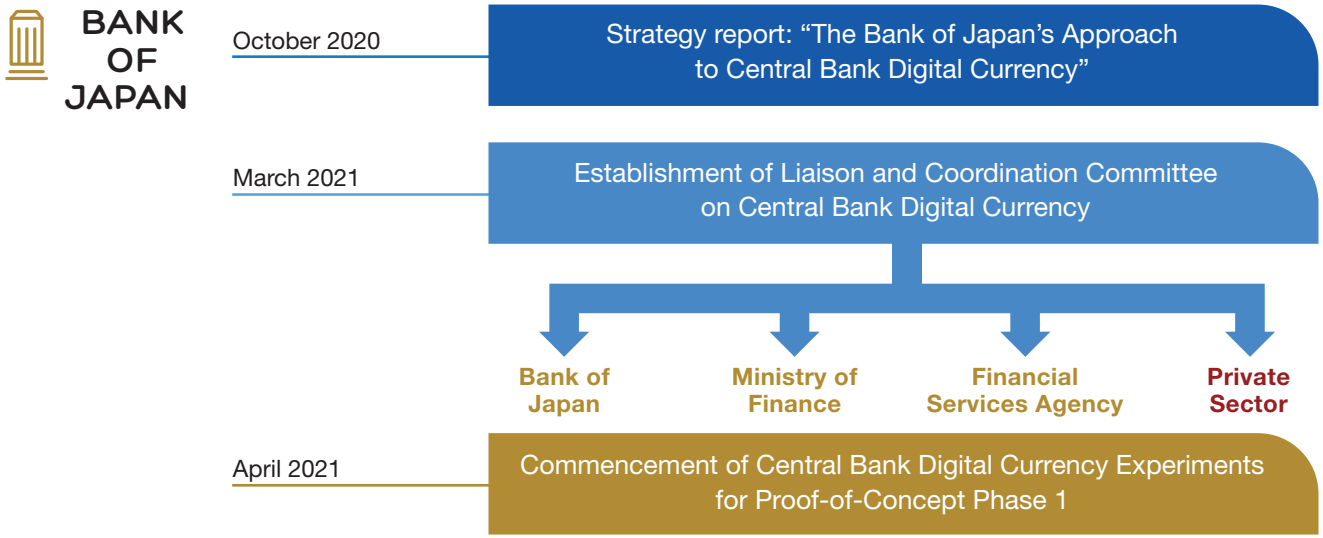
However, the development of CBDC in Hong Kong not only requires the research, development, and decision-making of the HKMA, but also the FSTB to coordinate relevant economic and financial departments to jointly promote its future application in Hong Kong. **The HKMA should therefore set up a joint CBDC steering group with the FSTB. The main responsibilities of this joint steering group should include formulating CBDC development strategies, coordinating the entire process of CBDC from development to implementation, communicating with the financial industry (such as the HKEX), and systematising international cooperation.**

Figure 17. **The Bank of England and HM Treasury established a CBDC task force**



Source: Bank of England

Figure 18. The Bank of Japan established the CBDC Liaison and Coordination Committee



Source: Bank of Japan

Conclusion

The latest developments in CBDC point towards the shaping of a new digital financial ecosystem. To ride the waves of digital finance and capitalise on opportunities as they emerge, Hong Kong would do well to coordinate, strategise, and promote the development of both retail and wholesale CBDC. Hong Kong should seek innovation, efficiency, and interoperability between its related financial infrastructures to respond to rapid changes in the market, thereby strengthening its position as an international financial centre.

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