

DMI

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Issue 3, August 2020


JOURNAL

Asia takes off

Driving payments into the digital age

DMI

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Company Number: 7032533.
ISSN: 2398-4236

JOURNAL

Issue 2, July/August 2020

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All eyes on Asia

Central bank digital currency and an upgraded financial architecture could soon become a reality across Asia Pacific, where a range of initiatives from the public and private sectors is edging closer to implementation, writes Philip Middleton, DMI chairman.

CENTRAL bank digital currency activity is accelerating in Asia, where a range of digital payments and financial infrastructure projects is moving from desktop study to beta test implementation. This edition of the DMI Journal takes the region as its inspiration with accounts of digital projects from both private and public sectors, stretching from China to Manila via Bangkok and Singapore. We also highlight a pair of projects from Europe.

Much attention is fixed on the People's Bank of China's test in four cities of its retail CBDC, a digital fiat currency distributed on the mobile phone platforms of two leading social messaging services. This adds much greater functionality to both private sector offerings, as well as potentially displacing cash for the majority of retail transactions. The PBoC is at pains to stress that its Digital Currency Electronic Payment is not designed as a substitute for cash. The digital cash circulating is fully collateralised, and the authorities have partial view over users and transactions. While the precise features of this model may not be attractive to other central banks, the experiment will be studied with great interest worldwide. Katie-Ann Wilson's article explores these and other issues in greater detail.

The Chinese authorities insist that DCEP is intended solely for use within China's borders. Therefore, they say, many of the


problems that would ensue if the currency was deployed externally – alignment of function and technology standardisation, settlement, and regulation and supervision, among others – will not arise. However, if a digital renminbi became the principal means of payment along the Belt and Road initiative, this could result in a de facto currency zone stretching over a significant swathe of the world. That might be sufficient to spark global currency wars, as discussed in another article.

The \$302.1bn annual flow of migrant worker remittances throughout Asia Pacific has been badly affected by the impact of Covid-19 on clunky, inefficient and expensive cross-border payments infrastructure. The combination of CBDC, smartphones and blockchain to address this pressing challenge is addressed in a fascinating article from the Asian Development Bank, which is at the forefront of the feasibility assessment.

Finally, the digital euro has just been launched although not by the European Central Bank. Read how the Bank of Lithuania has become the first issuer of a digital euro coin alongside other digital initiatives.

We hope this edition of the Journal provides you with some interesting summer reading.

If a digital renminbi became the principal means of payment along the Belt and Road initiative, this could result in a de facto currency zone stretching over a significant swathe of the world.



Boston Fed and MIT partner to trial digital currency

The Federal Reserve Bank of Boston and Massachusetts Institute of Technology are working on a 'multi-year effort to build and test a hypothetical digital currency oriented to central bank uses', Fed Governor Lael Brainard has confirmed. The objective is for the US to understand the trade-offs that could arise with the creation of a digital dollar.

Tel Aviv Stock Exchange prepares for blockchain-based securities lending

The new platform will function as a one-stop-shop for all securities lending activities, permitting access to larger securities volumes within shorter timeframes. The Tel Aviv Stock Exchange wants to utilise some of the advantages of blockchain, such as direct peer-to-peer transactions, smart contracts, and greater security through immutability.

China to expand digital currency pilot

China's digital currency will soon be rolled out in three new regions: the Beijing-Tianjin-Hebei region, Yangtze River Delta, and the Greater Bay Area, according to the ministry of commerce. This is likely to happen by the end of 2020, with the possibility of further regional expansion into 'central and western areas'.

Bank of England chooses Accenture for RTGS rebuild

The Bank of England has chosen Accenture as its technology delivery partner to build a renewed real-time gross settlement system by 2022. The service will increase resilience and access, offer wider interoperability, improve user functionality and strengthen the end-to-end risk management of the UK's high-value payments system. The rebuild will allow for interoperability with distributed ledger technology systems.



Spanish banks finalise smart contract payments trials

Banco Sabadell, Banco Santander, Bankia, BBVA and CaixaBank have successfully completed a proof-of-concept test to enable the execution of payments initiated by smart contracts on blockchain networks. During the tests, more than 20,000 payments were processed across seven operating nodes.

FURTHER READING

A collection of research, reports and white papers from central banks and the industry over recent months, showing how the narrative is evolving in the payments sector. These documents outline current views on designs and experiments in digital currencies, as well as the concerns and challenges that lie ahead.

Digital Currencies: Public and Private, Present and Future

DBS, August

<https://www.dbs.com/aics/templatedata/article/generic/data>

Technical hurdles for CBDC

Bank of Japan, July

<https://www.boj.or.jp/research/brp/psr/data/psrb200702.pdf>

Project Ubin Phase 5: Enabling Broad Ecosystem Opportunities

MAS and Temasek, July

<https://www.mas.gov.sg/-/media/MAS/ProjectUbin/Project-Ubin-Phase-5-Enabling-Broad-Ecosystem-Opportunities.pdf>

A Survey of Research on Retail Central Bank Digital Currency

IMF, June

<https://www.imf.org/en/Publications/WP/Issues/2020/06/26/A-Survey-of-Research-on-Retail-Central-Bank-Digital-Currency-49517>

Digital Currencies and Stablecoins: Risks, Opportunities, and Challenges Ahead

Group of Thirty, July

https://group30.org/images/uploads/publications/G30_Digital_Currencies.pdf

FedNow instant payments gains momentum

The Covid-19 pandemic has highlighted the importance of ensuring people have immediate access to funds. The Federal Reserve is therefore prioritising the implementation of the FedNow real-time payments and settlements service. Despite the launch date likely to remain in 2023 or 2024, the central bank will take a phased approach so that a core set of features get to market ‘expeditiously’, with additional features being added over time.

Powering ahead on digital payments

Asia's digital currency plans are much more developed than those of western economies, but there are disparities across the region, write Bhavin Patel and Kat Usita.

IN THE RACE TO issue the first central bank digital currency, Asia's unmatched growth in digital payments gives the region momentum for developing blockchain-powered payments systems.

Central banks in Asia, aware of the inevitability of the payments evolution, are exploring ways to issue a CBDC. A retail CBDC could ramp up widescale payments digitalisation, which until now has been driven mainly by the private sector.

The introduction of digital payments in Asia aimed to fulfil intersecting goals: boosting retail sales, improving financial inclusion and facilitating remittances. These needs have prompted the development – and success – of various online banking solutions and mobile wallets. A retail CBDC would cater to these same objectives, improving existing digital payments ecosystems with a government-backed token.

China is a prime example of the mobile payments boom. A projected 32.7% of point-of-sale payments are made via mobile, double the figure in the UK (15.3%) and US (15.0%), as shown in the chart on page 8. The People's Bank of China reported a 36-fold increase in the volume of mobile transactions to 61bn in 2018

from 1.7bn in 2013. The country's two dominant mobile payments platforms, Alipay and WeChat Pay, account for 93% of these transactions. Their ubiquity, ease of use and convenience, coupled with their integration with other in-app services, have established them as key players in the Chinese payments system.

Both Alipay and WeChat Pay have sought to expand in neighbouring Southeast Asia, but face stiff competition from local players like GrabPay (Malaysia, Singapore and the Philippines) and GoPay (Indonesia). Mobile wallets succeeded in part because they originated from separate digital services for which there was already a high volume of transactions, providing a natural incentive for adoption. Alipay enabled mobile payments for ecommerce giant Alibaba. WeChat Pay facilitated transfers between contacts on a messaging app. GrabPay and GoPay are both offshoots of ride-hailing services Grab and Gojek.

Digital infrastructure

Uptake of digital payments and services has accelerated in the last decade alongside improvements in telecommunications

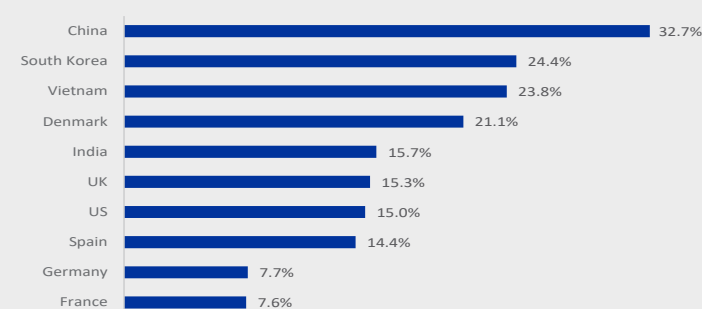


The introduction of digital payments in Asia aimed to fulfil intersecting goals: boosting retail sales, improving financial inclusion and facilitating remittances

Asia's progress in developing CBDC reflect populations' preference for technology, convenience and digitalisation of services

China first in mobile payments adoption

Projected user penetration rates of mobile payments applications



Source: World Economic Forum, Statista Digital Market Outlook and OMFIF analysis

infrastructure. China, Japan, Singapore and South Korea, global leaders in 5G deployment, have high-quality digital infrastructure that encourages use of mobile wallets and other digital services. Southeast Asian countries like Indonesia, Malaysia, the Philippines, Thailand and Vietnam are not far behind, having had to scale up telecom infrastructure to connect fast-growing, smartphone-wielding populations.

The digital ecosystems in these countries facilitate – and, in turn, benefit from – remittance flows. The Asian Development Bank reports that remittance flows to Asia in 2018 were \$302.1bn, 44% of the global figure. Migrant labour from the region represents 20.4% of the world total. International money transfer systems have grown in reach and volume of transactions to facilitate remittances, while mobile wallet providers find ways to integrate this service in their platforms.

Asia's digital transformation, pushed by organic demand for specific digital service platforms, created an ideal landscape for exploring digital currencies. The region's progress in developing CBDC reflect populations' preference for technology, convenience and digitalisation of services.

The PBoC's acceleration towards retail CBDC is part of a wider strategy to provide an alternative to the private sector payments

methods that dominate the market. (See page 10). The central bank anticipates leveraging the established mobile payment solutions to disseminate its digital currency, as experiments indicate an integration of the PBoC's digital currency in the ewallets of WeChat and Alipay applications will be essential.

Continent of contrasts

There are differences within Asia. The use of retail CBDC is imminent in China, and Cambodia is likely to follow suit in the next year. Meanwhile, Thailand and Singapore are experimenting with wholesale CBDC systems, and determining real business and commercial use cases (see pages 14 and 16).

Cambodia plans to create greater competition in its payments industry. It is building a backbone system, Bakong, to interoperate with incumbent payments service providers, leaving the public to decide which vendor to use.

Japan, still a heavily cash-based economy, has resumed its exploration of CBDC. The Bank of Japan announced plans to test the feasibility of a national digital currency. It is requesting input from the private sector and collaborating with several other central banks to create a working group.

Similarly, the Bank of Korea launched a CBDC pilot in April to study potential use cases in its payments system. The objective is to future-proof South Korea's payments systems and allow for contingency planning if there is ever a need to issue CBDC.

The rate of adoption and implementation is not homogenous through the bloc. Asia Pacific is ahead of most western countries in their digital currency plans, but many economies in the region are still transitioning towards to a more digital future.

Social media platforms are gaining prominence in countries like India. Cash use is declining amid the rise of ecommerce. Financial inclusion needs are growing, and consumer preferences are shifting to digital channels. These trends may require central banks to step in where the private sector dominates to provide digital money.

We expect many other countries in Asia to bring forward credible use cases for CBDC in the next few years. So far, China is the frontrunner. •

Maintaining remittances during the pandemic

Expanding digital remittance channels will help protect this key source of funding during the pandemic, writes Bambang Susantono, vice-president for knowledge management and sustainable development at the Asian Development Bank.

THE 16 JUNE celebration of the International Day of Family Remittances highlighted the importance of remittances in the economic growth of developing countries and the provision of basic needs for migrants' families.

Studies show that remittances have a positive impact on gross domestic product per capita growth and a negative relationship with poverty. Remittances also lead to an increase in domestic production and consumption, creating employment.

Remittances to low- and middle-income countries reached a staggering \$682.6bn in 2018, \$302.1bn of which was sent to Asia alone. Remittances are a substantial source of external funding and a large share of GDP for many countries. In 2018, in terms of GDP share, four of the top five receiving countries were in Asia and the Pacific. They were Tonga (35.2%), Kyrgyzstan (33.6%), Tajikistan (31%) and Nepal (28%).

International migrants have found themselves unemployed and some were forced to return home due to the pandemic. A fall in remittances in 2020 is unavoidable. The World Bank projects that remittances to India and Bangladesh, the first and ninth highest remittance recipient countries, are expected to fall by 23% and

22% respectively. The largest drops are expected in Europe and central Asia, each expected to experience a fall of about 27.5% due to the combined effects of the pandemic and low oil prices.

Three policies can help mitigate remittance challenges. First, economic support measures that benefit migrants and remittance service providers should be put in place. These measures should also support the development and scaling up of digital remittance channels for migrants and their families. Second, regulatory guidance for proportionate know-your-customer requirements that are critical to scale digital financial services, especially for unbanked and undocumented individuals, must be provided. Third, measures can be explored to reduce remittance transaction costs and expand financial education and awareness, including of digital remittance channels.

As such, the Asian Development Bank supports the call to action on remittances by the international community. It is critical to ensure that mitigating the remittance challenges is considered as part of responses to the pandemic. It is more important than ever that everyone stands together to help migrant workers, their families and communities. •



Remittances to low- and middle-income countries reached a staggering \$682.6bn in 2018, about three times larger than official development assistance



The PBoC will adopt a two-tier model, issuing and redeeming its CBDC via commercial banks, payment services and telecoms. Commercial banks will then distribute it to the public and retail sector

China gets ready for its next world first

The People's Bank of China will soon roll out a digital currency that will mimic cash. With details slowly emerging as to how digital renminbi will function, there are concerns about financial instability and disintermediation, writes Katie-Ann Wilson, programmes manager for emerging markets at OMFIF.

IN THE 11th century, China was the first to issue banknotes and develop the concept of legal tender. Now, it is one of the first countries to develop a central bank digital currency that can be used for all retail payments.

In April, Beijing confirmed plans to pilot a digital renminbi in several districts, followed by a wider roll-out in 2022, through its 'digital currency electronic payment' project, known as DCEP or E-CNY.

Technology companies Alipay and Wechat account for more than 90% of the local retail payments market. The People's Bank of China's acceleration towards retail CBDC is part of a wider strategy to mitigate financial stability concerns arising from big tech's dominance over payment services.

OMFIF's Digital Monetary Institute was told the PBoC intends to supplement the M0 money supply – cash – and not change existing currency in circulation. The bank will adopt a two-tier model, issuing and redeeming its CBDC via commercial banks, payment services and telecoms. Commercial banks will then distribute it to the public and retail sector.

This two-tier model distinguishes itself from the more contentious one-tier model, where consumers would have their own account at the central bank and receive CBDC directly. A two-tier set up ensures that commercial banks can still offer financial

services to their customers.

However, this does not remove all financial instability and disintermediation concerns. Consumers would have a new option available for deposits, meaning commercial banks would compete for deposits with the central bank. A potential outflow of retail deposits could impact banks' funding costs, affecting their lending capacities. A 1:1 collateralised digital currency could reduce the amount of private credit in the economy.

A significant drop in deposits could lead to greater interbank lending, creating higher funding costs for commercial banks. Households may have to bear the cost of a fall in banks' profitability, in the form of high lending rates. The PBoC has not yet outlined how it would react in such a scenario.

As part of M0, the CBDC would share many properties with cash, qualifying it as legal tender. Like banknotes, the digital currency would remain the bank's liability, as commercial banks deposit renminbi in exchange. To prevent new currency from entering circulation, it will be backed 1:1 by fiat currency.

As a cash complement, it will be non-interest-bearing and subject to transaction limits as well as payments regulation. This reduces the incentive to exchange all money into E-CNY, easing some concerns of financial disintermediation for commercial banks.

Over time, there could be monetary policy implications if the E-CNY replaces all cash. At present, banks are more likely to pass on negative interest rates to clients because the costs of holding cash, as a zero-return alternative, are high (considering storage and transport). These costs would not apply to E-CNY. By creating a more effective, non-interest-bearing alternative, it would reaffirm the zero-lower bound and restrict the PBoC's room for manoeuvre on interest rates. However, the central bank has not suggested that cash will be going away any time soon.

Limits on cash, such as daily withdrawal caps, are likely to apply to the amount of daily transactions that can be undertaken using E-CNY. Further limits on exchanging all deposits into digital wallets could be imposed to manage CBDC demand.

Distinguishing public and private money

Conversely, while controlling CBDC demand is an important part of mitigating financial instability, ensuring the digital currency is popular enough to be adopted throughout China is also key. The distinction between commercial bank money (private money) and central bank money (public money) is not always clear to the public.

The benefits of publicly available central bank money – cash – are evident in periods of financial crisis or when digital disruption weakens confidence in commercial banks or big tech companies. But while consumers can physically hold cash, CBDC would probably sit in a digital account, similar to privately issued digital currency. This would make the benefits of holding CBDC less apparent, even in a crisis. Communicating with the public on the difference between holding claims on a central bank over a private institution will be crucial.

To encourage people to adopt CBDC, it could provide additional

functionalities not typically offered by electronic payment services. This could include, for example, the ability to make payments offline.

A major distinction between E-CNY and cash and existing electronic payment options lies in its technical design features. With cash, no accounts are required. It is entirely value based, relating to the actual movement of value from one hand to the next. This enables it to be entirely anonymous. With the likes of Alipay and Wechat, transactions can only happen between two bank accounts. Firms store financial data, but it is not readily available to the government.

The PBoC says it will use 'loosely coupled account links' to create 'controllable anonymity'. Under this system, E-CNY will be transferable from one e-wallet to another without using a bank account. A screenshot of this online wallet revealed the ability to link other accounts, meaning users can still use other platforms such as Alipay. Only a portion of the money in that account will be in E-CNY.

This digital cash is only partially anonymous. Under the PBoC's centralised management, transactional data will be disclosed to the central bank as the third party. The bank is effectively giving up some personal data and privacy for greater control over tax evasion, terrorist financing and money laundering. This offers an unprecedented ability to track currency movements and could have important implications for cross-border transactions.

It remains to be seen how E-CNY could facilitate cross-border transactions. Questions on renminbi convertibility remain crucial, feeding into wider policy debates regarding China's capital account openness and the level to which it wishes to integrate into the global economy. •

Distributed ledger technology could change wholesale systems, which may enable countries to overtake previous payment systems

Banking's technological transformation

Piyush Gupta, chief executive officer and director of DBS Group, talks to Brandon Chye, economist at OMFIF, about the future shape of central bank digital currency, and helping clients adapt to digital disruption.

BRANDON Chye: Over the past five years, DBS has undergone a digital transformation. What prompted this shift? How do you see DBS' capabilities in payments and banking developing over the next five years?

Piyush Gupta: We started our digital transformation in 2014. At the time, technology was disrupting entire industries, whether telecommunications, transportation or retail. We knew that banking would not be immune, given that it is the most 'digitisable' industry of all.

We viewed big technology companies as a benchmark, but we realised that there were five fundamental differences between these firms and DBS. They acquired customers digitally, fulfilled transactions instantly, and emphasised cross-buy rather than cross-sell.

They focused on building customer loyalty through partnerships instead of dealing directly with consumers, and had data-first operating models.

Learning from these companies, over the past few years, we focused on building capabilities in these areas. We have made good progress on digital acquisition, transactions and customer engagement. But much remains to be done on ecosystems and data, two priorities going forward.

BC: What are the important technologies that will shape the payments and remittances landscape in the coming years? How has DBS approached creating an in-house innovation model to integrate these technologies?

PG: Blockchain could be a gamechanger in cross-border payments. It could alter settlement processes, from the centralised 'hub and spoke' model, which can take up to two days to complete transactions, to real-time settlement across borders. This could give rise to digital or cryptocurrencies that serve the function of value transfer.

In Singapore, cash usage is declining. DBS has introduced a number of digital payment solutions such as DBS PayLah! and PayNow. We are experimenting with the Monetary Authority of Singapore to see how we can leverage blockchain domestically. An example is Project Ubin, whereby the industry and MAS came together to test the feasibility of a settlement system using distributed ledger technology to enable instantaneous settlement of payment and securities transactions.

BC: On the external side, banks are fundamentally client-centric organisations. How has DBS approached the digital transition with customer

bases such as small- and medium-sized enterprises and large corporates?

PG: Instead of making our products and services the starting point, a few years ago, we started embedding ourselves in the customer journey. This involves first mapping it, whether they are an SME or a large corporate client, and identifying the business problems they face, in order to better address them. This required changing our employees' mindset, from being 'inside-out' to 'outside-in'. This transformed the way we work. We have also been educating our customers. It is difficult to drive behavioural change, but the Covid-19 pandemic has accelerated the digital transition.

BC: In recent months, there has been much interest in central bank digital currency, at both retail and wholesale level. The People's Bank of China's digital currency electronic payment is one of the most notable initiatives being trialled. Should banks see these developments as a risk for disintermediation, or an opportunity for innovation?

PG: CBDCs have potential, but come with many challenges. In domestic markets they could, over time, replace cash. In countries like China, where Alipay and WeChat Pay have made mobile payments ubiquitous,

cash is almost obsolete. CBDC has little added value if electronic payments services have already replaced the use of cash.

There is an even bigger issue. If consumers hold an account directly with the central bank, this could heighten the risk of a classic bank run, weakening the banking system. In the extreme, if everyone in the country has an account with the central bank, the banking sector could be disintermediated, leaving the onus of credit formation on the central bank. This is one of the biggest risks and drawbacks that CBDCs pose.

With regards to wholesale CBDC for cross-border transactions, it may be difficult for counterparties abroad to accept this payment method. However, a network of central banks willing to exchange and settle each other's digital currency might be viable. Several experiments of this nature are under consideration. We see its potential in boosting the speed and efficiency of cross-border payments and securities trading and settlement, and would be open to being involved in such pilots.

BC: Banks' move into the digital realm raises questions about data management, financial regulation and compliance. How has DBS approached this challenge, especially when encountering fragmented regulatory frameworks in cross-border operations?

PG: Data sharing across teams and countries is important for many financial activities, such as combating money laundering, or balance sheet management. This is why we endeavour to work with regulators to ensure that our data sharing is efficient. In cases where there may be concerns about the cross-border sharing of data because of, say, national data protection rules, we will work with the relevant authorities to address sensitivities, such as through tokenisation or data masking. •

'It is difficult to drive behavioural change, but the Covid-19 pandemic has accelerated the digital transition.'

PROFILE

Education:

Piyush Gupta holds a degree in economics from St Stephen's College, University of Delhi, and a post-graduate diploma in management from the Indian Institute of Management, Ahmedabad.

Career:

Piyush Gupta is chief executive officer and director of DBS Group. He was previously CEO of Citi for southeast Asia, Australia and New Zealand. Gupta is vice-chairman of the Institute of International Finance. He is a member of the United Nations secretary-general's task force on digital financing of the sustainable development goals, and Singapore's advisory council on the ethical use of artificial intelligence and data.





The project demonstrated the technical feasibility of DLT to achieve key basic payment functions such as bilateral transfer, queuing mechanisms and gridlock resolution

The Bank of Thailand completes wholesale CBDC project

A successful rollout of its wholesale CBDC project has allowed the Bank of Thailand's focus to expand into corporate and retail digital currencies, writes Vijak Sethaput, senior developer for Project Inthanon.

IN AUGUST 2018, the Bank of Thailand launched Project Inthanon, a collaborative project with eight financial institutions evaluating the potential of decentralised ledger technology and develop a proof-of-concept for wholesale central bank digital currency. The project was divided into three phases.

In phase one, we built wholesale CBDC for decentralised real-time gross settlement. The project demonstrated the technical feasibility of DLT to achieve key basic payment functions such as bilateral transfer, queuing mechanisms and gridlock resolution. In addition, we explored innovative functions that could enhance payment efficiency such as automated liquidity provision and tokenisation of debt securities.

Built upon the findings from phase one, phase two focused on addressing inefficiencies in regulatory compliance and settlement processes. We conducted delivery-versus-payment for interbank bond trading and repurchase transactions, and regulatory compliance and data reconciliation for third party funds transfer. We found that DLT and smart contracts could enhance the efficiency of bond trading and repurchasing activities. The transparency of the third-party fund transfers was also enhanced by allowing senders to check beneficiary information

and efficiently track the status of transactions.

In phase three, we explored interoperability among ledgers to achieve cross-border transfers by collaborating with the Hong Kong Monetary Authority in a bid to reduce associated costs and enhance efficiency. Together, we designed a Thai baht-Hong Kong dollar corridor network - an extensible infrastructure that enabled real-time and peer-to-peer payment-vs-payment cross-border transfers between Thailand and Hong Kong. Not only could the corridor cut costs and boost speed by eliminating the layers of correspondent banks in the conventional model, it also pioneered an open cross-border payment network that could further connect with other central banks. Project Inthanon-LionRock was completed in December 2019.

For the next step, the Bank of Thailand extended the research and experimentation from wholesale CBDC to corporate and retail levels. With the HKMA, we will continue to collaborate and enhance the functionality of the corridor network. In addition, we are launching a CBDC project with domestic corporates. A CBDC prototype will be integrated into supply chain management and the financing system. This prototype hopes to bring higher payment efficiency to domestic businesses. •

Designing a digital currency for the common good

The Covid-19 crisis highlights governments' central role in providing for their citizens, and how digital methods can help them achieve this, writes Wolfram Seidemann, chief executive officer of G+D Currency Technology.

MORE THAN any other crisis before it, the Covid-19 pandemic has underlined the importance of public goods. Medical care, education, and physical and digital infrastructure, for example, contribute significantly to people's quality of life.

The public payments infrastructure is another 'mission critical' area. Cash is inclusive, universal, resilient, and the user is independent from the issuer. That is because it is issued and governed by an institution that is guided by the public interest. Lockdowns have encouraged a boom in e-commerce, but without a subscription to a digital service provider, many consumers cannot pay digitally. The pandemic has exposed the need for digital cash. It has confirmed that, as guardian of currency and economic stability, it is part of central bank's mandate to provide an inclusive digital means of payment. Many people agree with this view, as shown in the OMFIF report, 'Digital currencies: A question of trust'.

Digital cash is well-suited to the transmission of monetary policy in a crisis. In April, in a remarkable attempt to boost its

economy, Macau issued contactless prepaid cards to all citizens. Each card came with a balance of Mop3,000 (\$377), to be used in local stores within three months. The government will top up the cards in August. This demonstrates how digital financial inclusion can support economic growth.

How should a public currency be designed in the digital world? For people to accept it, it must ensure users' anonymity and protect their privacy – the opposite of today's digital payment offerings. However, a digital legal tender is not a matter of displacing private institutions. Central bank digital currency is collaborative rather than combative. Digital cash has enormous potential to increase efficiency and reduce costs throughout the currency cycle. It presents opportunities for all parties to offer value-added services, based on central banks' infrastructure for secure and instant means of payment. There is a business case for CBDC, but it should not be a private venture benefiting a single party. Rather, CBDC should be designed for the common good. It will serve both businesses and the people. •



As guardian of currency and economic stability, it is part of central bank's mandate to provide an inclusive digital means of payment



Now that we are done experimenting with blockchain, we can move on to the next phase of commercial adoption

Singapore a step closer to blockchain adoption

With the final phase of Project Ubin now complete, the financial industry is gearing up to adopt distributed ledger technology, writes Sopnendu Mohanty, chief fintech officer at the Monetary Authority of Singapore.

LAST MONTH, the Monetary Authority of Singapore concluded the fifth and final phase of Project Ubin, in collaboration with the financial industry. This explored the use of blockchain and distributed ledger technology for clearing and settlement of payments and securities. Beyond technical experimentation, the purpose of this phase was to measure the commercial viability and value of blockchain-based payments, and build a foundation for future live pilots and industry trials. We started with two concurrent workstreams, on technical development and use cases. These later merged to test connectivity and integration.

The technical development workstream focused on setting up the 'Ubin V' network, built on production-grade infrastructure. While still a prototype test network, it was conceived to be production-ready.

The use cases development workstream aimed to identify potential efficiency gains for the broader economy, particularly untapped opportunities at the intersection of payments and business use cases. The workstream conducted a series of workshops involving industry to review blockchain use cases

across capital markets, trade and supply chain finance, and insurance, among others.

The connectivity and integration testing workstream entailed close co-operation with commercial blockchain applications to test integration with Ubin V. Our report features several case studies and highlights the benefits that could be attained through better connectivity and simplified operational processes.

Project Ubin has helped shape our view on the future of payments. The report outlines design ideas and concepts to improve the payments infrastructure, and how these could be applied to today's financial architecture.

As with all innovation adoption, there is a time for experimentation and prototyping, and a time for commercialisation. Now that MAS and the Project Ubin community are done experimenting with blockchain, we can move on to the next phase of commercial adoption. With a clearer understanding of the technology's benefits and business value, we look forward to seeing further commercial adoption and live implementation. •

Lithuania's playground innovation

The new LBChain platform, the first of its kind, is helping start-ups and financial companies experiment with blockchain, while providing hands-on experience for regulators, writes Martynas Pilakis, adviser to the board the Bank of Lithuania.

AS INNOVATION transforms all aspects of finance, central banks may find themselves at risk of remaining mere spectators. The Bank of Lithuania is a digitally-oriented regulator and central bank. This year, we introduced two world-firsts, LBCOIN and LBChain.

LBCOIN, issued in July, is a blockchain-based digital collector coin. It combines classical numismatics and modern technology, and is dedicated to the Act of Independence of Lithuania and its 20 signatories.

Numismatics, a fairly niche area, served as a 'playground' for the central bank and retail users. Our experiment helped us identify and resolve myriad legal, technological (blockchain-related) and cybersecurity issues, among others. It has been a steep learning curve. We expect LBCOIN technology to serve as the basis for issuing further digital tokens to test various central bank digital currency parameters.

LBChain is a blockchain-based sandbox, the first of its kind developed by a financial market regulator. The platform blends regulatory and technological infrastructure. It allows

companies to test their innovative solutions in a controlled environment, while providing hands-on learning experience for regulators. LBChain is based on enterprise blockchain platforms, Hyperledger Fabric and Corda.

The platform's development took two years and was divided into three stages. The first stage focused on developer selection and concept creation. During the second stage, the BoL set up and tested the platform prototype. The third phase was dedicated to final testing and development.

So far, 11 financial technology firms from eight countries have used LBChain to trial more than 10 different financial products and services.

LBChain is a cradle for future technologies unrestricted by geographical or sectoral boundaries. Start-ups and financial companies can use it to gain knowledge and carry out blockchain-oriented research. Testing of know-your-customer and anti-money laundering procedures was especially popular among the fintech companies that have already taken part in the project. •



We expect LBCOIN technology to serve as the basis for issuing further digital tokens to test various CBDC parameters



A trader in Africa may soon find it more convenient to order goods from a Chinese partner via WeChat and settle via Alipay. And if they can settle instantly with their Chinese digital currency (or, to be fair, Libra or similar) then they will find themselves accepting the same in payment

The digital currency era starts here

Alternatives to fiat currency are no longer speculation. As central banks launch pilot projects and China tests its digital renminbi, dollar dominance could be coming to an end, writes David Birch, author and adviser on digital currencies.

JUST AS THE US Treasury was mailing out physical stimulus cheques, the People's Bank of China began its beta testing of a national digital currency in four cities. Future economists will look back on these counterpoints as the start of the digital currency era.

Discussions about alternatives to fiat currency were speculative, until last August. At the 2019 Jackson Hole Symposium, Bank of England Governor Mark Carney stated that a new form of global digital currency could be 'the answer to the destabilising dominance of the dollar in today's global monetary system'.

Instead, Carney said, the international monetary system could use a synthetic hegemonic currency. A proportion of the world's financial transactions would no longer dollar-denominated, and the demand for dollars would fall.

As Robert Kaplan, president and chief executive officer of the Federal Reserve Bank of Dallas said last year, 'The dollar may not be the world's reserve currency forever, and if that changes, and you tack on 100 basis points to \$20tn, [that is] \$200bn a year and all of a sudden we've got a tremendous problem.'

People seem to use the terms digital money, electronic cash, cryptocurrency and digital currency interchangeably.

Electronic cash is a specific kind of digital money that allows value transfer without intermediaries. Cryptocurrency is a mechanism for such value transfer. Digital currency links the values being transferred to an external benchmark.

A globally-acceptable SHC in the form of a digital currency made from digital money denominated in a synthetic unit of account sounds similar to Facebook's much-discussed Libra. The Libra Association recently issued a white paper in which it talked about creating stablecoins tied to national currencies alongside the original 'basket' stablecoin. The consortium hopes that, 'as central banks develop digital currencies, these CBDCs could be directly integrated with the Libra network, removing the need for Libra networks to manage the associated reserve'. At the same time, Facebook renamed its Calibra digital wallet 'Novi', presumably to emphasise that its ambitions extend beyond simply serving as a personal storage mechanism for Libra value.

Many observers believe the People's Bank of China's work on CBDC is the most important current initiative in the world of digital fiat. The PBoC has been looking at a digital currency strategy to replace cash for years. Three years ago, Governor Zhou Xiaochuan set out the bank's thinking about digital

currency, saying, ‘It is an irresistible trend that paper money will be replaced by new products and new technologies.’ He added that as a legal tender, digital currency should be issued by the central bank. After noting that he thought it would take a decade or so for digital currency to completely replace cash, he went to state his intention ‘to gradually phase out paper money’.

Yao Qian, founder of the PBoC Digital Currency Research Lab, wrote in 2017 that CBDC would have consequences for commercial banks, and that it might be better to keep those banks as part of the new monetary arrangement. He described what has been called the ‘two tier’ approach, noting that to offset the shock to the banking system imposed by an independent digital currency system (and to protect the investment made by commercial banks on infrastructure), it is possible to incorporate digital currency wallet attributes into the existing commercial bank account system ‘so that electronic currency and digital currency are managed under the same account’.

The new cold war

This is noteworthy, and I agree with historian Niall Ferguson, who said in *The Sunday Times*: ‘If America is smart, it will wake up and start competing for dominance in digital payments.’ He is concerned about hegemony and argues that a good way for the US to rival Chinese initiatives such as Alibaba and Tencent is to support Libra, an argument repeated by David Marcus, the head of Libra. Alipay and WeChat wallets store renminbi exchanged in and out of bank accounts, but as the PBoC has made clear in recent pronouncements, these will soon store the

digital currency electronic payment, known as DC/EP or E-CNY, the Chinese digital currency that is being tested in Shenzhen, Chengdu, Suzhou and Xiong’an.

The contrast brings into focus the ‘new cold war’ that Ferguson has talked about. Imagine if, say, 2bn people along the Belt and Road trading corridors start using Alipay and WeChat wallets. They may begin by using their own currencies, but could shift to the digital renminbi if it offers speed, convenience and person-to-person transfers. A trader in Africa may soon find it more convenient to order goods from a Chinese partner via WeChat and settle via Alipay. And if they can settle instantly with their Chinese digital currency (or, to be fair, Libra or similar) then they will find themselves accepting the same in payment.

Along the Belt and Road then, not only might digital currency be acceptable, it could be highly beneficial to trade and prosperity.

Not everyone would cheer such a development. The dollar’s ‘destabilising dominance’ gives the US the ability to use the international payments system as an arm of its foreign policy. The real and serious implication of replacing the existing payments systems with the new infrastructure based on digital currency is that no clearing and settlement means no transactions going through the international banking system. No transactions going through the international banking system means that the US’ ability to deliver soft power through Swift disappears. For anyone interested in the evolution of the international monetary and financial system, this deserves attention. •

A globally-acceptable SHC in the form of a digital currency made from digital money denominated in a synthetic unit of account sounds similar to Facebook’s much-discussed Libra



 **Digital Monetary Institute**

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For programme queries and requests please contact katie-ann.wilson@omfif.org

16 September

CBDCs and banks: Evolution or revolution?

Virtual panel: ING-DMI Digital Forum

A central bank digital currency for retail payments raises questions about commercial banks' business models and their role in the financial system. There are significant implications for commercial banks' funding base and central bank supervision, with each CBDC design choice creating different consequences for the banking sector. This panel explores these choices and their impact on commercial banks.

25 September

Navigating the digitalisation transformation

Virtual seminar with François Villeroy de Galhau, Governor, Banque de France, and Pablo Hernández de Cos, Governor, Banco de España

As technological innovation in the financial sector continues with advances in blockchain and digital currencies, central banks are assessing how best to regulate the sector's transformation. This seminar gives an overview of how central banks are responding to the challenges and risks that these developments pose.

8 October

DMI-CSIS: Launch of findings

Virtual panel

The DMI, in partnership with the Centre for Strategic and International Studies, convenes a panel to discuss the findings of a series of roundtables exploring the digital currencies landscape and the long-term implications for the financial architecture.

SPOTLIGHT 19 August: Central bank digital currencies and blockchain

This discussion addressed how blockchain could benefit central bank digital currency. It explored distributed ledger technology design choices, and how DLT can interact with existing technologies or vendors. Further topics included the use of smart contracts or 'programmable money' to enable interoperability across blockchain networks within and across borders.