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The Digitalisation of Central Bank Money

China Advances while Europe Hesitates

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The number of digital currencies has increased significantly in recent years. So-called central bank digital currencies (CBDCs), created by central banks, are at the forefront of this development. Combining the advantages of an electronic means of payment – namely the speed and efficiency of transactions – with the stability and confidence that central banks enjoy, CBDCs will surely have a significant influence on the development of international payment systems in the coming years. Work on this topic has accelerated significantly in many parts of the world following the imposition of sanctions against Russia by the G7. The European Union (EU) and China are also engaged in planning and shaping their own CBDCs, but there are significant differences in the motivations, pace of progress and ambitions associated with these projects.

As illustrated by many recent developments in the financial world, the digitalisation of money is evident and inevitable. Among other trends, this process includes wild speculation in cryptocurrencies, the emergence of data-driven payment platforms with large customer bases, and disruptive fintech innovations in financial intermediation as well as the programmability of financial transactions using new blockchain technologies. At the same time, there has been a marked decline in the use of cash worldwide, including in the eurozone and in Germany. It is thus virtually inevitable that central banks – the public custodians of stable money and secure payment transactions – would react to these trends, that is, develop and circulate digital money themselves. The announcement by Facebook/Meta in June 2019 that it was seeking

to create its own means of payment (which ultimately failed) was a wake-up call. It made it clear that fundamental attributes of state sovereignty – such as money creation, financial stability and the effectiveness of monetary policy – are at stake.

Central bank digital currency – a new form of legal tender

Central banks around the world are announcing the development and issuance of CBDCs, which are digital money and legal tender. They are issued by the central bank and – like cash or balances held at the central bank – represent a direct payment obligation of the central bank. There are two forms of CBDC: one that is available to consumers (retail CBDC) and another that is



issued to companies specialising in the execution of payment transactions (wholesale CBDC). CBDCs can be issued as value-based “tokens” using a blockchain that is managed by the central bank, thus enabling peer-to-peer payment transactions in the same way as cash, or they can be account-based, meaning that payment transactions are processed via accounts at the central bank.

As state money, CBDCs could become a reliable, widely accepted alternative to private digital money. Central banks see the provision of a secure and reliable digital means of payment as a necessary tool to safeguard the sovereignty of their monetary policy in the medium to long term, which is essential for maintaining financial stability and fulfilling their tasks. In view of the decline in cash holdings, which are close to disappearing in some countries, CBDCs are intended to guarantee access to central bank money in the future as well. A generally accepted and trustworthy CBDC is required to guarantee efficient, secure payments and interoperability between different private payment systems, as well as to ensure data protection and security in financial transactions. The efficiency and productivity potential of new technologies (i.e. the blockchain and distributed ledgers) and innovations such as smart contracts should be publicly accessible and not exclusively tied to certain platforms. CBDCs could also offer potential benefits in combating money laundering, crime and terrorist financing; providing better financial inclusion; reducing costs; and creating possible new options in monetary policy. A brief overview of the potential costs and benefits of CBDCs can be found in the infobox on page 4.

According to the Atlantic Council, central banks in 134 countries and currency unions are currently examining the introduction of digital currencies. All G20 countries, with the exception of the United States, are in the advanced stages of development. In the United States, the issue is highly politicised. In May 2024, the US House of Representatives even passed a bill prohibiting the introduction of a “digital

dollar” by the US Federal Reserve. Three countries (the Bahamas, Jamaica, Nigeria) have already put CBDCs into circulation. The eurozone could introduce a digital euro on a trial basis by the end of 2025 at the earliest, in both the retail and wholesale sectors. The four BRICS founding countries (Brazil, China, India and Russia), on the other hand, are already experimenting with pilot projects on a practical level. China is the most advanced of the major economies, not least due to the firm support of the party and the state. The digital yuan could become the benchmark for the establishment of digital standards and the basis for the development of a China-centred, dollar-independent infrastructure for international payment transactions.

The e-CNY – China’s central bank digital money offensive

In China, there is a historical awareness that money and currency are an essential foundation of political power. Its own currency, the renminbi (RMB), as well as its digital offshoot, the e-CNY, are integral parts of China’s state sovereignty, identity and nationalism, and inevitably also of the Communist Party’s Marxist-Leninist claim to power.

The economic and social dimensions of money and currency in China are thus subordinate to these ideological and political premises. Accordingly, the People’s Bank of China (PBoC), China’s central bank, is not legally independent but rather a subordinate authority of the State Council.

Against the backdrop of the party and state’s unconditional claim on control of the economy and society, there was an urgent need for Beijing to find a regulatory answer to the systemic and political challenges posed by the Chinese digital economy (in the form of the large platforms Alibaba and Tencent in particular) on the one hand, and those emerging from outside in the form of private cryptocurrencies such as Bitcoin and Libra/Diem on the other hand, in order to preserve the state’s monetary

sovereignty. Instead of passively accepting monetary innovations from the private digital economy, the Chinese state is seeking to shape the future of blockchain technology, digital money and payment transactions as well as use new fintech systems to secure the power of the party and the state, at home and abroad.

China's digital currency project began in 2014, when the PBoC put together a team to research and plan its CBDC. A digital currency research institute was founded in 2016, and the PBoC launched the development phase together with commercial banks at the end of 2017. The first pilot projects were rolled out in April 2020, initially in four municipalities. Since then, the e-CNY has been successively introduced in other regions to more and more recipients. China is investing heavily in the technology, infrastructure and marketing of the new digital payment method and working to implement it quickly. However, the level of uptake by potential new users has been low, given the convenient payment methods already available from Alipay and WeChat Pay. It is estimated that around 260 million Chinese currently hold a digital wallet that authorises the use of the e-CNY, though it remains to be seen when the e-CNY will be generally available nationwide.

The e-CNY supplements and replaces physical cash in circulation with identical value (1:1). It is available to the general public ("retail-based") and is intended to be interoperable with all private payment systems. It is issued and administered centrally by the PBoC and put into circulation via commercial banks or other intermediaries. The e-CNY is fully backed by the central bank — it is booked as a direct liability of the PBoC. In order to be able to pay with e-CNY, users must register an electronic wallet by providing their identity and bank details before filling it with an authorised amount. The wallet can be accessed via smartphone apps, chip cards and machines. The e-CNY can be used both as a value-based payment token, for example for peer-to-peer transactions, and as an account-based currency via commercial and online

banks. "Offline" transactions, for example between two mobile phones, are already possible in principle. Payment transactions are cleared centrally via the PBoC by means of registration, authentication and verification.

According to a white paper published by the PBoC, China is pursuing three goals with the e-CNY, namely (1) the provision of cash in digital form, especially in China's less-developed areas, (2) ensuring secure, efficient and interoperable payment transactions between platforms and (3) prospectively using it for cross-border payments. However, the economic and political implications of the new CBDC go far beyond the technical level. In the e-CNY, China has an instrument with a wide range of possible applications and far-reaching domestic as well as international implications.

Firstly, the introduction of the digital RMB will open up completely new options for China's fiscal and monetary policy due to the programmability of the e-CNY. For example, the PBoC will be able to make direct payments to households and companies and limit or condition them in terms of time, region and usage. It also offers radical new options for monetary policy in terms of the tailored management of interest rates and the money supply.

Secondly, China's security agencies will be able to view the available payment transaction data in real time or trace it back if necessary. This opens up completely new possibilities for monitoring, prosecution and repression. Linking payment data to both the PBoC's credit rating system and the government's social credit system may enable China's authorities to influence and control human thought and behaviour to an extent that is very disturbingly reminiscent of George Orwell's dark visions.

Thirdly, the aim is to use CBDCs in the future to process cross-border transfers using the blockchain, peer-to-peer, in real time and at low cost, bypassing the existing banking and clearing system. China's technological expertise and practical experience offer it the opportunity to play a leading role in the development of payment infra-

Central bank digital currencies

Advantages and opportunities

- Safeguarding states' monetary sovereignty: issuing and circulating CBDCs; providing a reliable infrastructure for electronic payment transactions, safeguarding monetary and financial stability, averting the risks of digitalisation
- Cost, efficiency and performance improvements in payment transactions (both national and international): could be used as legal tender throughout the eurozone; offline transactions via smartphone, back-up possible in the event of network failure
- Strengthening the ECB in systemic and currency competition (vis-à-vis private platforms, stablecoins, other central banks)
- Safeguarding competition and promoting innovation in payment transactions
- Potential of technological innovation: the blockchain, smart contracts
- Ensuring data protection and data security in payment transactions (vis-à-vis private players)
- Curbing money laundering, crime and terrorist financing
- Inclusion: broader access to financial services in an increasingly cashless economy
- New options for monetary policy (helicopter money, negative interest rates)
- Seigniorage profits

Disadvantages, costs and risks

- CBDCs can have a negative impact on traditional commercial banks, as they could compete with traditional bank deposits
- Risks of bank runs due to flight from current account deposits into CBDCs during crises
- Scepticism regarding benefits for the consumer: limited attractiveness as a means of payment due to the planned holding limit (€3,000), low suitability as a store of value
- High implementation and operating costs for the financial sector and retailers – possibility of serious regulatory design errors
- Fears of physical cash being displaced
- No programmability of the digital euro
- Possibility for state monitoring of payment transactions
- Financial exclusion of those unfamiliar with the new technology
- Unclear monetary policy effects (particularly in the implementation of interest rate policy)
- Disruptive restructuring of cross-border payment transactions
- Geo-economic redistribution of financial hubs in international payment transactions

structure and the standards that apply to it. China is working intensively at different levels and with various initiatives on the interoperability between domestic and international payment systems.

Fourthly, a digital RMB that can be used in international business transactions could enable China and third countries to circumvent Western financial sanctions more easily. China has had its own platform for the clearing and settlement of international payments, CIPS (Cross-Border Inter-Bank Payments System), since 2015. With a functioning digital payment system centred on China, making transfers outside of Western clearing houses and bypassing the SWIFT system could be carried out cheaply and easily in the future. This would make it difficult to detect – let alone prove – sanctions violations.

The “digital euro” project

The project to introduce a digital euro is inferior to the Chinese project in terms of both the speed of development and ambition. It was launched following a decision by the European Central Bank (ECB) Governing Council in July 2021. For the ECB, the aim is to maintain the role of the euro as a reference standard and payment obligation that can be honoured at any time in the eurozone. The digital euro is intended to ensure that cross-border transactions within the monetary union can be processed smoothly, reliably and at low cost. Even 25 years after the introduction of the euro, payment transactions in the Eurosystem are still fragmented and non-uniform. Enrico Letta's report on the future of the European single market from April

2024 points out that digital money in Europe could be an important element in the integration of the European financial architecture. There is a diversity of payment systems in the single market due to the large number of card payment systems and the dependence on US companies in this sector. Reducing this dependency would not only bring financial benefits, but also make payments more secure, especially given the current political situation in the United States and the risk of trade disputes with the EU. In November 2023, the Eurosystem launched the second phase of the project, which was defined as the preparatory phase. This comprises the finalisation of a set of rules for the digital euro and the selection of providers to develop the digital euro platform and infrastructure. The new means of payment could be supported both by commercial bank applications and a special app for electronic devices developed by the Eurosystem, whereby offline payments should also be possible.

Although the plans are promising, Europe's version of the CBDC project is being implemented with caution. It should be noted that consumers will only be able to dispose of digital euros up to a holding limit of presumably €3,000. Although an increase in this amount is conceivable at a later date, this measure will initially serve to limit the use of the digital euro. According to the ECB's plans, payments using digital euros would only be possible with a corresponding account at a commercial bank. The ECB does not want its project to jeopardise the position of commercial banks in order to prevent a potential migration of deposits to the central bank.

Furthermore, it is planned that the digital euro will be limited to the 20 countries of the monetary union – at least for the time being. The draft regulation on the introduction of the digital euro of 28 June 2023 (COM(2023) 369 final) provides for some exceptions. Firstly, it will be possible to use the digital euro in EU countries outside the eurozone if the ECB and the national central bank of the respective country sign an agreement to this effect. However, the

scope of this use will be limited so that the national currency is not de facto replaced by the digital euro without the country in question fulfilling the convergence criteria. Secondly, the digital euro could be distributed in third countries, but only if the EU and the third country in question conclude an agreement beforehand. The distribution of the digital single currency would also be limited in this case.

The development of the digital euro has sparked a number of controversies. Commercial banks are concerned about competition for traditional bank deposits, as having digital currency in a central bank account could be seen as a safer deposit. Even though Europeans will only be able to access the digital euro with an account at a commercial bank, European banks and savings banks fear for their position in the European financial system.

The central banks' CBDC project is also often criticised for its expected lack of inclusivity. Concerns are centred on the fact that electronic money may only be used by a small, "digitally savvy" section of the population. It is also claimed that the introduction of the digital euro will lead to the abolition of cash. There are also fears that technocratic institutions, including central banks, will want to use digital currencies to monitor and control citizens. Many populist forces in the EU portray physical money as a guarantee of individual freedom. They are fuelling fears about the loss of state sovereignty in terms of monetary policy and the disadvantages concerning individual privacy.

In addition to promoting the digital euro project, the EU has also made efforts to promote the regulation of other digital currencies – including cryptocurrencies and stablecoins – in the EU single market. The EU's ability to shape its own regulatory environment for digital assets and ensure its effective enforcement will strengthen the stability of the European financial system, thereby increasing the EU's autonomy and independence from other jurisdictions.

Similarities and differences

A comparison between China and Europe reveals similarities, but also fundamental differences. In China and Europe alike, state sovereignty in the monetary system and in payment transactions is being threatened by private providers: in China by Alipay and WeChat Pay, and in the EU by the credit card companies Mastercard and Visa as well as Apple Pay and Google Pay. In both China and Europe, monetary policy authorities are faced with the task of ensuring a forward-looking, universally accessible and sustainable infrastructure for payment transactions. The organisation and design of the new digital means of payment are similar. In China and Europe alike, the issuance and account management of CBDCs will be carried out by commercial banks serving as intermediaries. All forms of CBDC will be put into circulation: retail, wholesale, value-based and account-based. Both China and the EU are attaching great importance to data security. Offline use should also be possible. In China, however, there is no corresponding holding limit up to which European users may keep CBDC. The main design difference, however, is data protection. In China, every payment transaction is stored centrally, can be viewed by the authorities and can be linked to other data systems. For the digital euro, on the other hand, the provisions of EU data protection rules apply, namely that control over personal data must remain with the individual user. The ECB will neither view nor store the data. The ECB's default scenario envisages that personal data from payment transactions will only be collected by the intermediary and not by the central banks. In addition, there is consideration about guaranteeing cash-like anonymity for payments of smaller amounts and offline transactions.

Another important distinction that reflects the different ambitions of the European and Chinese projects is that the digital euro is not intended to be programmable. In the EU, there were concerns that programmability could undermine the full convertibility of digital and traditional currency and

weaken the protection of users' personal data. This would not only restrict the functionality of the digital euro in economic and monetary policy, but also reduce its advantages compared to conventional electronic bank transfers.

In terms of implementation, the obvious difference is, of course, that the digital yuan is much further advanced in its development towards becoming a usable digital currency than the digital euro. The e-CNY can already be widely used in China, although Chinese households and businesses continue to make payments mainly through the established platforms of Alipay and WeChat Pay. Through early adoption and practical testing, China is advancing blockchain and distributed ledger technologies, setting technical standards, accumulating institutional expertise and gaining an international reputation. With the rapid introduction of its new digital means of payment, China's authoritarian government and centralised structures are once again proving to be a competitive advantage. However, it should not be ignored that China, as a CBDC pioneer, is taking political risks, as design errors in the e-CNY could lead to financial upheaval.

The ambitions of the Chinese party and state regarding the introduction of its CBDC are much more far-reaching than those of the EU institutions and member states. With the e-CNY, Beijing is pursuing industrial policy, foreign policy and security policy goals that go beyond the objective of protecting national monetary sovereignty. From the Chinese perspective, the current system of international payment transactions is not only costly and inefficient in economic terms, but also problematic in terms of security policy, as it gives the United States – its geostrategic rival – the power to exclude third parties. Individuals and companies from China, Hong Kong and Macao have already been the target of US financial sanctions on several occasions. A central bank digital currency now offers China the opportunity to pursue a disruptive new beginning. The People's Republic is therefore making considerable efforts to

develop blockchain-based payment platforms (“Universal Digital Payment Network”) and establish an internationally interoperable digital payment system (“mBridge”). Should it succeed in developing a new system of international payments based on interoperable CBDCs, this would no longer be a dollar-centric system. The resulting structures could create new dependencies in the future – now vis-à-vis China.

Although the scope of China’s ambitions is underestimated abroad (as has often been the case in the past), Europe, for its part, lacks strategic clarity, foresight and political ambition with regard to the digital euro. The European Commission and the ECB are not receiving enough of the necessary support needed for their plans from European politicians. Instead, the financial industry, cash advocates and populist parties seem to be dominating the discussion.

Outlook

It is essential to implement the digital euro project, as it will pave the way for the establishment of a pan-European payment infrastructure. Payments and payment systems are undoubtedly part of the critical infrastructure. It is problematic if cross-border payments in the Eurosystem are only managed by non-European service providers and if non-European platforms dominate electronic retailing in Europe, while at the same time the use of cash is becoming increasingly less prominent. To ensure competition, security, resilience and reliability in payment transactions, the introduction of the digital euro is both sensible and necessary, not least in light of potential crises.

However, the development of the digital euro is of much greater significance than the mere harmonisation of payment systems. The euro is exposed to currency competition with private and state players. Sovereignty over payment transactions is an indispensable prerequisite for the protec-

tion of state sovereignty. The ability to influence the governance of cross-border payments is an important factor in international relations. A geo-economic reconsideration of the EU’s position with regard to the development and security of its digital financial architecture with respect to its competitors is therefore necessary. The European digital currency project can only be successful if the EU demonstrates a similar level of ambition as can currently be observed in China.

It is therefore crucial that, in the long term, potential users operating in countries outside the eurozone or the EU single market also have access to the digital euro. In this context, the project could play an important role in the continued internationalisation of the single currency.

However, restrictions on the development of a European CBDC will remain in place for many years to come, even in the single market. The main reason for this is the persistent lack of trust in digital money and electronic payments in many countries, especially in Germany. The digitalisation of money is a multi-layered process that is not limited to experiments with currencies or payment systems. The process must also be inclusive, that is, it must be ensured that as many people as possible have access to the digital euro and can share in the potential benefits. This also includes imparting knowledge about how the financial system works, the risks of speculating with digital assets, and the security of online and offline payments.

Indeed, Europe is the only jurisdiction with such strong protection of personal data and consumer rights, which could be a decisive advantage in the future over competing projects such as the digital yuan. A prerequisite for this is accelerating the development of the digital euro and raising the ambitions of the project. This topic should be given greater consideration in discussions on competitiveness in the EU.



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