

R&D and Prospects for the Digital Pound in the Future

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Abstract. With the development of global digitisation, many countries are now focusing on central bank digital currencies. Digital currency will become the mainstream payment method in the future, so countries like the United States, China, the United Kingdom, Japan, European countries and others are actively striving for a head start in developing digital currencies and seeking to dominate the future payment field. The United Kingdom is an early start to putting the concept of digital currency into the country's research, which is currently in the 'design' phase. The Bank of England has initially proposed a digital currency model and lists 3 to 5 the issuance's primary purpose. The following introduces the fundamental progress of the digital pound, the modality concept, the current research results, and the future development trend of the digital pound are described in detail. Finally, there is a comparison between digital pound and digital yuan, as with digital US dollars.

Keywords: Digital pound; Privacy; Financial markets; Data protection.

1. Introduction

Most countries around the world are dedicating themselves to developing the CBDC. One of the main reasons is that they want to dismantle the monopoly of the US dollar: the US dollar is the main currency in international trade payments. According to the data, the dollar occupies 42.05% of international significant currency payments and has the largest foreign exchange reserves, occupying 60% of the world [1]. Digital Euro, Digital Yuan, Digital US dollar and Digital pound will all become the world's most important currency in the future. The research topic would be surrounded by the R&D of digital pound and predicted trends in the future. The research process was primarily informed by research published by the Bank of England on the digital pound and UK Finance's findings in recent years, comparing the data and using it to conclude. CBDC is the best future payment method based on changes in how people pay and will help stabilise the financial market, enhance financial inclusion and facilitate cross-border transactions, among other advantages. The country is still in the process of research and development. Although it is not possible at this stage to determine whether it will ultimately be issued, there is no doubt that the effect of digital pound development will benefit the future development of science and technology needs.

The remainder of this paper is organised as follows. Section 2 introduces the basic concepts of the digital pound model, using data to explain the motives in detail and lists some considerations and predictions of digital pound. After this, section 3 compares the digital yuan and the digital US dollar.

2. Digital Pound

2.1. The Basic Concepts and Research Advances of the Digital Pound

As technology advances, banknotes are used less frequently, and household and business needs change. Because of this, there is a growing interest in digital pound as a new form of currency [2]. This new type of currency is referred to as a central bank digital currency (CBDC), and in the UK, it is known as the digital pound [3]. The digital pound refers to the electronic currency the Bank of England issued. To access it, users can utilise digital wallets [2]. The digital pound will hold the same value and acceptance as a physical banknote but not replace it [2]. Instead, the digital pound will be equivalent to a banknote in terms of usage. The central bank assesses the policy measures and technology needed to implement digital pound. As such, it is unclear whether or not the digital pound will be built. However, even if it is, the process will take time.

As the Bank of England published the development process of digital pound, the bank just finished the 'research and exploration phase and decided to move to the next step, 'design' [4]. During the "design" phase, the Bank aims to create technological methods to promote the digital pound. They will also assess the feasibility and establish a clear framework. To achieve this, the Central Bank plans to foster collaboration between private and public companies to drive innovation and support the development of the digital pound. Additionally, this will allow the corporate sector to gain knowledge about it for future advancements.

2.2. The Motives for Developing Digital Pound

The digital pound was developed in response to changes in money and payment methods. With advances in digital payment technology, banknotes have decreased while bank cards and credit usage have significantly increased. Stablecoins is the new digital currency payment method that has emerged due to technological advances and is issued and operated by private banks [2]. Still, the Bank is refining a complete set of regulatory policies for now. Those card payments are often categorised as private money, deposits between private banks and households or businesses. Another type of money is 'public money', but there is only one type of 'public money', which is cash, which the Bank of England issues. According to the UK Payment Markets Summary, 57% of payments made in the UK in 2021 were made using cards. Of this, 32% of the payments were made through contactless cards, a significant increase from 3% in 2015 [5]. Based on this data, private money and commercial banks will dominate the market if this trend continues in the long term. If these banks introduce new payment methods or technologies, private firms will likely monopolise the market, which could lead to increased market risk and hinder innovation. Hence, the Bank must issue digital pound, as it can aid in stabilising financial markets and promoting innovation for everyone. Digital pound payment is safer, more dependable, and risk-free, as it is considered "public money." Overall, the Bank has two motives for implementing the digital pound [2]. Firstly, it aims to ensure the stability of the financial market and the security of transactions by promoting the digital pound as a significant payment method, similar to bank card payments. The digital pound can also act as a security anchor during the process. Secondly, the Bank hopes to encourage innovation and healthy competition to improve development through public-private sector partnerships. The Engagement Forum is a forum that enables those with information to share their creations. The platform can encourage stakeholders and experts in CBDC to come together to exchange information, learn about CBDC, discuss the operability of the CBDC framework, or focus on issues such as user experience needs [6]. The research and development of the digital pound may be hindered or restricted by the United States in various ways, as the development of digital currencies in multiple countries can fundamentally weaken the hegemony of the US dollar. The long period of hegemony of the US dollar since the end of World War II has given the US a powerful economic capacity, military capacity, etc., and the development of the digital dollar may be ahead of other countries [1].

2.3. The Basic Model for Retail CBDC

The Bank would build its model for the digital pound on these primary motivations, and the model must be constructed to have qualities that meet the stability of the financial markets, act as a security anchor, and be risk-resistant to encourage innovation and reform. The Bank believes that the platform model is suitable for building a very secure, risk-free, and efficient and resilience platform known as a 'Core Ledger'; the private sector or corporates would act as intermediaries, the Payment Interface Provider (PIP) and External Service Interface Provider (ESIP) [4]. The PIP deals with payment-related interactions, while the ESIP provides additional non-payment services. Both of them would be responsible for communicating with customers and for delivering the digital pass-through wallet technology so that they would hold basic customer information, much like the relationship between banks and their customers today. They would also have Known Your Customer (KYC) and Anti-Money Laundering checking obligations to ensure the security of digital pound transactions [4]. PIPs store data about all users and require users to authenticate themselves before using a digital pound

wallet, as it is their responsibility to protect users' privacy whilst preventing financial crime and complying with data protection laws. For example, when the Bank needs it to measure and maintain the core ledger, PIPs would anonymise the data and provide it to the Bank of England. Even though the Bank does not have access to users' data, anonymised data can still assist in improving and innovating [2, 4].

All these are proposals for digital pound used for households and businesses, which is also a retail CBDC. In the digital pound model, there is a need to set regulatory guidelines and operational requirements for PIPs and ESIPs, which, according to the conditions provided by the banks, must be guaranteed to operate around the clock without any downtime, be accessible to all users, including vulnerable groups, be easy to use, and protect the privacy of each user as well as continually meet the needs of a changing society with new technological innovations. The payment needs of a changing community can be met with new technological innovations. Finally, it can have the ability to deal with network attacks and, in the event of failure, can be timely mouth disease recovery. While banks are focusing on PIP research, they are also considering the possibility that using PIP may increase the incidence of fraudulent offences. It is essential to develop the digital pound with a focus on preventing fraud. Both the payment methods and serviceability of PIP may become a place for fraudsters to exploit while being exposed to financial risk. In recent years, the occurrence of fraud offences has been on the rise. Specifically, the amount of money lost to Authorized Push Payment (APP) scams has increased from 207.8 million pounds in 2020 to 355.3 million pounds in 2021, almost a 70% increase [7]. Also, to reduce the probability of financial crime and fraud, the digital pound will be a real name and hold more information about the payee or receiver in the case of large-value transactions. However, the digital pound may allow anonymous small-value transactions, which are currently being investigated regarding tiered identity verification and enhanced privacy controls. In addition to UK residents, the Digital Pound has several requirements for access rights for non-UK residents, the first and most important of which is to develop a commonly recognised regulatory framework with non-UK PIPs and ESIPs, which will effectively protect user privacy and prevent money laundering, fraud and other offences. At the same time, the UK authorities may restrict the areas where the use of the digital pound is permitted, and some areas with high fraud crime rates and high money laundering criminal activities may be excluded from the permitted perimeter.

Regarding digital pound payments, banks offer several recognised methods, including mobile, computer payments, innovative card payments and website and app-based forms. Based on the data mentioned before, the frequency of people's use of bank cards has continued to increase over the years. The bank deduces that paying with a smart card or a wallet in a smartphone will become the primary payment method for using digital pound. Under the current design, consumers can pay by holding smartphones close to a card reader, just as we would with contactless payment, and then we can log into wallets to check their balance after making the payment. Despite data showing that most people own smartphones today, some still do not, and given that some users do not like mobile phone payments, the Bank is still considering issuing physical cards to pay for digital pound. Despite this, the bank prioritises developing new payment methods and anticipates that private suppliers will introduce further innovations.

2.4. The Introductory for Wholesale CBDC

The above is a summary of the research and development of retail CBDCs, and the Bank of England is now focusing on promoting CBDCs that can be used between households and businesses. Another type of CBDC is wholesale CBDCs, which are large-value transactions used for foreign exchange settlements and other operations between various financial institutions. Although Real-Time Gross Settlement (RTGS) and Clearing House Automated Payment System (CHAPS) are now used for wholesale accommodation, the central bank and financial institutions are constantly researching and innovating better payment models based on existing payments [2].

3. The Future Consideration for Digital Pound

3.1. Data Protection and Privacy

Data protection and privacy is a significant concern for the digital pound [8]. Because of the potential risk of data being leaked to private companies, the central bank has said that the digital pound will strictly comply with UK data protection laws, give consumers more rights to make their own choices, and enhance consumer understanding of data sharing and the right to know. The digital pound will do a better job of protecting the public's privacy. The Bank of England has assured that the digital pound will do at least as well as bank accounts do today when protecting customer privacy, and probably better [2]. Consumer data will only be held by suppliers, meaning banks and other companies they work with, who have the right to use customer data but must also comply with UK data protection laws, and beyond that, will only be used for law enforcement purposes, such as whistleblowing for crime prevention purposes or related behaviour. In addition to the above standards that the digital pound will meet, for the consumer to gain more benefits, it will ensure that the consumer has the right to control their data following legal and banking regulations. This means that users can choose whether or not to share their data and the option to refuse if necessary. That is to say, the digital pound promotes a tiered accounts function, where users can choose different levels of authentication when using Digital GBP, and the level of authentication is also linked to the payment function, which means that the more personal information a user provides, the more privileges they can have to make large payments. In contrast, some users can offer less biased information when they only need to pay for a small amount of money. However, it is essential to note that the digital pound is not anonymous [2]. This is due to the necessity of identifying users by their real names to prevent fraudulent and criminal activity.

3.2. Stabilising Financial Markets

The implementation of digital pound would help to stabilise the financial markets. For further refinement of the digital pound model and its formal rollout, the bank will individual account limits and the issue of financial inclusion. The bank has decided that during the launch of the digital pound, personal account limits will be kept between £10,000 and 20,000 [2]. The reason for the limits is to minimise risk and volatility in the currency markets during the sensitive period of launching the digital pound. There is no clarity on whether personal boundaries will be changed in the future and by how much, considering the specific use of the digital pound and the availability of better alternatives that can stabilise the financial markets. Currently, there is no set range for limits on businesses. However, it can be assumed that corporations will have higher limits than individuals due to their size and the amount of money they would transact.

3.3. Increasing Financial Inclusion

Financial inclusion is the second vital aspect to consider for the future development of the digital pound [8]. As a result of digitalisation, financial services (e.g. banking, insurance, etc.) have become more accessible and, at the same time, have raised the barriers to financial inclusion for some users, such as those who are digitally inaccessible, do not have the skills to use digital payment methods, or do not have a bank account and prefer to pay in cash. The Digital Pound will actively innovate to remove as many barriers as possible and make the Digital Pound accessible to all. The digital pound will be the dominant payment method of the future in the view of the central bank and the Treasury, and it may turn out to be a central bank-issued currency of the exact nature as cash, which is safe, convenient and does not pay interest [2].

3.4. Future Trends of CBDC

Based on the boom in digital currencies around the world right now, it is expected that in the future, the digital US dollar may not monopolise the payments market as the US dollar does today and will not be able to force most countries to have to use the US dollar for international trades. And the digital

euro may take its place as the mainstream transaction currency. EU countries, China, Japan, the UK and many other countries worldwide have wanted to break the hegemony of the US dollar since the end of World War II. The arrival of the digital currency era means that all countries have a new starting line, and anyone can have the opportunity to lead the new international financial order without having to stockpile US dollars in the long term and take too much financial risk. With the weakness of the digital US dollar, CBDC in other countries is actively developing. The digital yuan is likely to get stronger and stronger. Despite its difficulties and the US crackdown, it is already ahead of most countries and has a well-developed operating model. In the future, it is expected that the digital US dollar, the digital euro and the digital yuan will take over the discourse and become important currencies globally [1].

4. Comparison of Digital Pound, Digital Yuan, Digital Dollars

4.1. Comparison of Digital Pound and Digital Yuan

China's increase in CBDC research can be attributed to creation of a central bank digital currency research group and the development of a prototype program in 2014. [9] In Suzhou, Shenzhen, Chengdu, and other cities, the CBDC has been undergoing closed pilot testing for several years. There are over 1.32 million digital RMB pilot projects in operation, with an accumulated transaction value of approximately ¥34.5 billion as of the first half of 2021 [10]. The United Kingdom put forward the concept of digital pound in 2014. In the next few years of research, it mastered the mature digital pound theory and technical proof technology and came to the forefront. For China, the active development of the digital yuan can enhance the yuan's influence in the international arena and strengthen the right to speak [1]. The digital yuan plays an essential role in dismantling the US dollar hegemony. The UK wants to lead the EU in developing the digital euro and securing London's position as one of the world's leading financial centres [11].

4.2. Comparison of Digital Pound and Digital US Dollars

In January 2022, the U.S. released a report on the digital US dollar [1]. In November 2022, the New York Federal Reserve announced a pilot project on the digital dollar [12]. One of the reasons why the US, as a country with a strong voice and economic power, has not been very 'active' in digital dollar research may be because the US dollar is still so prominent in its international status that it will be difficult for a currency to replace it in a short period. The birth of the digital dollar would bring significant benefits to US companies, consolidate the status of the dollar, as well as allow the US to use its dollar hegemony to gain more benefits.

5. Conclusion

This research highlights research reports and data surveys published by the Bank of England on the digital pound and summarises the digital pound's development process and predictions of future trends. CBDCs are widely recognised globally as having great potential to become an essential form of currency globally. The Bank of England and HM Treasury believe that the development of the digital pound will consolidate the position of 'public money' in the digital age, weaken the frequency of use of 'private money', increase the stability of the financial market and encourage innovation through public-private partnerships [2]. The digital pound has the same effectiveness and characteristics as the banknotes currently issued by the Bank, being safe, secure, efficient and interest-free. The next phase of the UK's digital pound research and development, which is currently in the design phase, will focus on developing the structure of the digital pound, increasing cooperation with the private sector and carrying out validation experiments. This study focuses on the modelling concept of the digital pound and the technical considerations during the development process. It did not address the feedback on the user experience of the Digital Pound trial and the subsequent

improvement options. The following research will focus on user experience to improve the digital pound model.

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