The Central Bank Digital Currency in Malaysia: A Literature Review

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Abstract Central Bank Digital Currency (CBDC) is a digital form of central bank money, and is different from traditional reserves or settlement accounts balances. In line with the digital technology era, CBDC has gained interest among the majority of the countries. Central banks in a number of countries have started experimenting, piloting, launching, and have laid their direction on CBDC. However, the development of CBDC in Malaysia is still behind compared to many other countries in the world. This paper aims to present the current status of CBDC in Malaysia. To achieve the goal, this paper explores literature reviews on CBDC, countries' milestones on CBDC and Malaysia's Central Bank stand on CBDC. This review found that Malaysia's Central Bank has no intention for the immediate plan for CBDC in Malaysia. However, Malaysia's Central Bank continues assessing the CBDC potential, especially in the digital assets and payments space. This study also found that

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Malaysia's Central Bank participated in a cross-border payments trial under Project Dunbar.

Keywords Central Bank Digital Currency (CBDC) · Central bank · Malaysia

1 Introduction

Generally, a central bank issues two types of liabilities: physical banknotes and electronic central bank deposits, also known as reserves or settlement balances (Engert and Fung 2021). Physical notes or cash are the main payment methods used by consumers and merchants for transactions. However, with the evolving technologies, the global trend of the payment system has shifted from a cash to cashless society. Citizens around the world are currently applying the latest innovation of contactless payments and mobile payment, which are more convenient and lower transaction costs. Hence, these have become the necessary factors for the central banks to develop their own digital currency.

1.1 The Overview of Central Bank Digital Currency (CBDC)

Central Bank Digital Currency (CBDC) is predicted to be one form of central bank money. A CBDC is a digital form of central bank money that is different from balances in traditional reserve or settlement accounts. For clarity, CBDCs should be viewed in the context of other types of fiat money (Ward and Rochemont 2021). It uses a digital token to represent the virtual form of a fiat currency of a particular nation or region. It is essentially different from the various forms of virtual currency (such as bitcoin, ethereum, and ripple) that have been created by private entities and whose market prices have exhibited very sharp fluctuations in recent years (Bordo and Levin 2021). CBDC is fully developed by the central bank using underlying blockchain technology. Countries worldwide are currently active in developing their own CBDC, and China leads the initiative by officially launching its digital Yuan in early 2021 (Arreddy 2021). While other countries, including the United States (US), United Kingdom (UK) and Russia are also working progressively to develop their CBDC (Ward and Rochemont 2021).

Ward and Rochemont (2019) defined Central Bank Digital Currency (CBDC) as a digital form of central bank money and it is different from balances in traditional reserves or settlement accounts. Meaning, Dyson, Barker and Clayton (Meaning et al. 2018) stated that CBDC could be viewed as electronic narrow money and, in some ways, it already exists in the form of central bank reserves. The local perspective defined CBDC as central bank cash in the form of banknotes and coins made available in electronic form (Ahmat and Bashir 2017a). According to Kumhof and Noone (Kumhof and Noone 2021) CBDC is electronic central bank money that can be

accessed more broadly than reserves with greater functionality for retail transactions compared to cash. It has a separate operational structure to other forms of central bank money, potentially serving a different core purpose (Kumhof and Noone 2021). In simple terms, CBDC is a digital form of money that currently exists in the current central banking system used for banking transactions, and CBDC is part of bank reserves in the digital form.

1.2 The Origin of Central Bank Digital Currency (CBDC)

Business transactions between two or more parties initially started with the barter-trade systems, and later banknotes and coins were introduced as a payment method. However, with the growth of the internet and communication technology, society has started to use less cash in daily transactions. Along the time, cashless business transactions have contributed to the existence of digital currencies such as cryptocurrencies.

Cryptocurrency is treated as a commodity, that means that transactions on its sales are to be taxed on the added value (Bolotaeva et al. 2019). Cryptocurrencies have become relevant to China (QuickTake: How China is Closing in on Its Own Digital Currency 2021) and also relatively important for Sweden (Bech and Garratt 2017). Yet, Malaysia is not left behind; Cryptocurrencies trading in Malaysia has shown substantial growth despite the worldwide economic crisis during the COVID-19 pandemic (Helms 2020).

Bitcoin, Ethereum, Ripple, and Tether are examples of cryptocurrencies working on a Distributed Ledger Technology (DLT) technology in the blockchain network. Distributed Ledger Technology (DLT) using consensus algorithm which allows data or transaction to be stored globally across servers (Mukhopadhyay 2018). Respective of cryptocurrencies, the term Central Bank-backed Cryptocurrencies (CBDC) refers to an electronic form of central bank money that can be exchanged in a decentralized manner known as peer-to-peer. Peer-to-peer refers to transactions that occur directly between the payer and the payee without the need for a central intermediary (Bech and Garratt 2017). Due to its decentralization, immutability, and high security behind its cryptography, cryptocurrencies in blockchain technology bring a trust model that does not rely on a central authority (Bech and Garratt 2017). Not relying on central authority is seen as a threat to the current traditional banking system. Realizing the minimum ability to control the growth of cryptocurrencies in business transactions, banking and financial institutions have started to launch their own version of Central Bank Digital Cryptocurrencies (CBDC). The CBDC is expected to operate as the digital currency backed and under the purview of a central authority, that is the central bank.

2 Implementation By Country

Generally, there are two major phases of CBDC development that are being implemented. The phases are either research phase or proof-of-concept stage. The following section will discuss the CBDC implementation phase based on countries.

2.1 Research

In recent years, many central banks around the world have been studying the possibilities of introducing CBDC in their economy. Among the countries that are actively looking at the impending introduction of CBDC in their monetary system are the United States of America (USA), United Kingdom, Brazil, Singapore, European Union countries, Thailand, India, and Venezuela, among many others. The full list of the countries are given in Table 1.

For example, The US Federal Reserve has been actively researching a central bank digital currency (CBDC). At least two prototypes of potential payments systems connected to a digital dollar are near completion. This is being led by officials at the Federal Reserve Bank of Boston and the Massachusetts Institute of Technology (MIT). The project was dubbed as "Fedcoin", and is in the advanced stage of research in the state of New York and Massachusetts (Dodev 2018).

In addition, as Venezuela has been subject to a variety of financial sanctions and its own currency hyperinflated, it launched a cryptocurrency backed (in theory) by petroleum in 2018 that is not reported to be widely used (Pfister 2019). The *petro* was designed to be distinct from the national currency and it has not been historically uncommon for socialist societies to have a separate "hard" currency for use by foreigners, the elite and in international trade in tangible goods but the government of Venezuela has little credibility, and its guarantee of the backing of each petro by a barrel of oil from its reserves had little value (Náñez Alonso et al. 2020). Since Venezuelans have access to bitcoin and other cryptocurrencies as well as conventional digital payment systems by way of US bank accounts, the result is widespread use of the US dollar and private payment systems (mainly based in the US) which was the worst possible outcome from the point of view of a national central bank.

2.2 Proof-of-Concept

Apart from the countries that are still in the research phase, many others are already in the final stage of proof-of-concept (POC). Among the countries that have reached the implementation phase are: China, Canada, Sweden, Saudi Arabia and UAE, Turkey, France, Thailand, Indonesia, Norway, and many others.

Among the most advanced countries in the POC phase is China. As such, China's digital yuan (E-CNY) has been on trial since April 2020 in three cities and was reported to have supported 4 million transactions by November (Somasundaram 2020). The E-CNY is designed as a replacement for physical cash. Although the trial started with the People's Bank of China (PBOC) giving 200 yuan each to 50,000 randomly selected consumers, it is really a two-tier system in which the PBOC issues E-CNY to commercial banks who may issue it to customers through mechanisms of their own. Commercial banks (and other payment providers) have to deposit reserves equal to the E-CNY, which they issue with the PBOC (John 2020). Consumers use E-CNY through interoperable software wallets provided by the banks and other issuers but in practice this is similar to other digital payment systems such as WeChat or Alipay, both already widely used in China.

Another example of a later stage implementation is in Sweden where they are experimenting with the Swedish E-Krona. The Swedish E-Krona system is based on DLT with a central ledger run by the Riksbank (Swedish Central Bank) and on which authorised private payment providers record all transactions of CBDC account holders (Viñuela et al. 2020). The Riksbank would issue digital currency to banks who would distribute it to end-users. In this respect it is similar to the digital yuan. Relatively small anonymous transactions may be allowed on the system and prepaid value cards could of course be exchanged in a manner similar to physical cash. The governor of the Riksbank has called for the E-Krona to become legal tender but the project has been running in simulation mode during 2020 (Nelson 2021). Sweden is perhaps the country with the lowest use of physical cash and the central bank acknowledges that a CBDC is required in order to maintain its traditional monetary role (Sveriges Riskbank 2018). The risk of disintermediation in the banking industry, through individuals switching from commercial bank accounts to CBDC accounts with the central bank is addressed in a clever way by the E-Krona project. It proposes that balances to a certain amount in E-Krona be held at zero interest but amounts higher than the limit be subject to an interest rate lower than available in commercial banks, and possibly negative, in order to avoid this problem.

In addition, a cross-border project was initiated by Saudi Arabia and United Arab Emirates (UAE) to investigate the viability of making cross-border payment using digital money which is known as Project Aber (2020). Saudi Arabia first launched Project Aber with the UAE in late 2019. The goal with the project was to look at the feasibility of developing a cross-border digital currency. The combined effort of two central banks in such a study is among the first of its kind. Project Aber was different from most pilot programs as two central banks and a further three commercial banks from each country were involved in the project. The high-level objectives of Aber were: to research Distributed Ledger (DLT) technology and to explore its suitability for such an experiment; to see whether inefficiencies of the existing cross-border payments could be overcome using a CBDC; as well as gaining knowledge and experience in DLT technology and the challenges of deploying a mutualized infrastructure. The project's conclusion confirmed that a cross-border dual issued currency was technically viable and that it was possible to design a distributed payment system that offers significant improvements over a centralized

payment system (UAE, Saudi Arabian central banks release report on Project Aber CBDC trial 2020).

3 CBDC in Malaysia

Central Bank of Malaysia or Bank Negara Malaysia (BNM) is the main entity to issue money, serves as Malaysia's banker and adviser, and regulates the country's financial institutions, credit system, and monetary policy. BNM is also responsibles to looking into the CBDC implementation in Malaysia. In the following section, the central bank of Malaysia or known as Bank Negara Malaysia (BNM), viewpoints and directions on CBDC are presented and discussed.

3.1 CBDC from the Bank Negara Malaysia Perspective

Figure 1 illustrates the CBDC milestones of central banks. There are four categories on the milestones, with central banks showing varying levels of progress in CBDC and their drives for the CBDC. For example, the USA, Sweden, China, and Ecuador are interested in the CBDC for daily transactions by the public. Similarly, Canada, Thailand, Hong Kong, and Singapore are in the proof-of-concept phase, focusing on cross-border CBDC settlement. Despite the positive shifting to CBDC among all the banks illustrated in Fig. 1, Ahmat and Bashir (Ahmat and Bashir 2017b) reported some banks are more cautious of CBDC, for example, due to the uncertainties and complexities of retail CBDC, banks are advised to conduct thorough research before deciding to embark on the CBDC issuance. Among the dilemmas they are facing are, either they are too fast in the implementation of CBDC without proper assessment of the risks or too slow in adapting to the advancement of technology.

Meanwhile, according to Bernama (Bernama 2021), Bank Negara Malaysia (BNM) has no intention for the immediate plan to issue CBDC in Malaysia. The BNM will actively assess the potential value proposition of CBDC in light of developments in the digital assets and payments space. Key CBDC policy choices, according to BNM, would be guided by obvious advantages to Malaysia as a whole while also ensuring that the risks associated with CBDC issuance, notably financial stability concerns, are appropriately addressed. As stated by BNM, CBDC issuing should be used in conjunction with other payment instruments, such as physical currency, to guarantee that all Malaysians, particularly those in underserved areas, continue to have access to secure and efficient payment options.

Generally, the hesitation to use digital assets as payments among central banks is contributed by the fact that they do not possess the universal characteristics of money. According to BNM, among the risks of using them as a good store of value and medium of exchange are; proneness to price volatility, vulnerable to cyber threats, and lack of scalability (Bernama 2021).

Table 1 CBDC implementation by country

Country	Implementation phase
Australia	Proof-of-Concept
Bahamas	Public launch (first in the world)
Brazil	Research
Cambodia (Project Bakong)	Proof-of-Concept
Canada (Project Jasper)	Proof-of-Concept
Chile	Research
China	Proof-of-Concept
Ecuador	Research
Europe (Europe Central Bank)	Research
France	Proof-of-Concept
Hong Kong (Project Aurum)	Proof-of-Concept
India	Research
Indonesia	Proof-of-Concept
Japan	Proof-of-Concept
Lithuania	Research
Morocco	Research
Norway	Proof-of-Concept
Russia	Proof-of-Concept
Saudi Arabia & UAE (Project Aber)	Proof-of-Concept
Senegal	Research
Singapore (Project Ubin)	Research
South Africa	Proof-of-Concept
South Africa	Proof-of-Concept
South Korea	Proof-of-Concept
Sweden	Proof-of-Concept
Switzerland (Project Helvetia)	Research
Thailand	Proof-of-Concept
Thailand	Research
Tunisia	Proof-of-Concept
Turkey	Proof-of-Concept
Ukraine	Proof-of-Concept
United Kingdom	Research
Uruguay	Research
USA	Research
Venezuela	Research

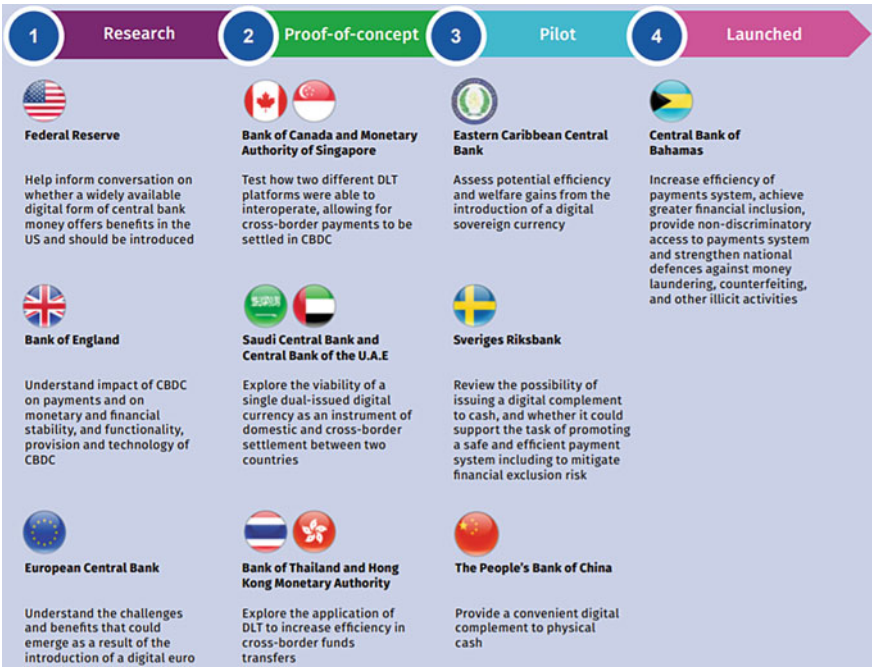

Fig. 1 CBDC milestones for other central banks (Ahmat and Bashir 2017b; Promoting safe and efficient payment and remittance system 2020)

An analysis by Price Waterhouse Cooper (PWC) showed between Asia countries, Malaysia is behind its neighbors in the CBDC arena, especially compared to nations such as Cambodia, Thailand, mainland China, Hong Kong, and Singapore, which have emerged as being amongst the most mature CBDC projects to date stages (Kaur 2021). Another separate report by Bank for International Settlements (BIS) released in January 2021 found that about 60% of central banks are conducting experiments or PoC projects, up from 42% in 2019, while another 14% are moving forward to development and pilot.

However, John (2021) reported that central banks in Malaysia alongside Australia, Singapore, and South Africa would conduct a cross-border payments trial using several CBDC to see if cross-border payments allow transactions to be settled more cheaply and easily. The cross-border involvement of Malaysia is called Project Dunbar. Project Dunbar will develop prototypes for shared platforms that will enable international settlements with digital currencies issued by multiple central banks to allow direct transactions between institutions, reducing costs and increasing speed (BIS Innovation Hub and central banks of Australia, Malaysia, Singapore and South Africa will test CBDCs for international settlements 2020). Results will inform global and regional development and support the G20 roadmap for improving cross-border payments (BIS Innovation Hub and central banks of Australia, Malaysia, Singapore and South Africa will test CBDCs for international settlements 2020). In addition,

Kiff et al. (2020) reviewed some of the processes, roles, and responsibilities that would need to be defined for creating, issuing, distributing, freezing, deactivating, and destroying CBDC. They also suggested several general foundations for discussions on whether to issue CBDC, with concrete operational considerations.

In June 2021, Kaur (2021) reported that BNM Director of Financial Development and Innovation said during a Fintech Fireside Asia session that Malaysia's central bank would conduct a proof-of-concept (PoC) study to assess the benefits of a CBDC by emphasizing wholesale CBDCs (Kaur 2021). Malaysia is seen not going into retail; however, Maybank participates in Bakong Project alongside the National Bank of Cambodia (NBC). The NBC started experimenting with digital wallets for cross-border transactions with Maybank by experimenting with the possibility that Cambodian citizens working in Malaysia could transfer funds to Cambodia with much lower costs (Adam-Kalfon et al. 2021). The Bakong project aims to increase financial inclusion in a country where most residents are unfamiliar with bank accounts, yet, mobile phone usage is widespread, and the Bakong attempts to improve financial inclusion. It also allows interbank, real-time electronic transactions and promotes transactions in Cambodian riels, compared with today, where the bulk of transactions are in US Dollars (Adam-Kalfon et al. 2021). Not to be left behind, Malaysia is currently involved in Project Dunbar, which brings together the Reserve Bank of Australia, Bank Negara Malaysia, Monetary Authority of Singapore, and South African Reserve Bank with the Bank for International Settlements Innovation Hub to test the use of central bank digital currencies (CBDCs) for international settlements (Project Dunbar: international settlements using multi-CBDCs 2021).

4 Conclusion

For centuries, buying and selling have been using cash. However, in line with the growth of computers, communication, wireless technologies, online banking system, and the need for cashless transactions due to the pandemic, cashless has been seen as a good alternative for payments. Innovation on contactless payment is seen as more convenient and safer for consumers. Hence, these have become the necessary factors for the central banks to have their own digital currency CBDC to reduce dependency on cash. Countries like China, Sweden and Bahamas have a clear direction on CBDC in their societies. Based on the existing studies and reports, Malaysia has seen no intention for the immediate plan to issue CBDC. However, BNM on CBDC issuance in Malaysia is taking a careful move towards CBDC. BNM currently assesses the potential value of CBDC, especially in the digital assets and payments space. Importantly, BNM has to ensure CBDC is beneficial to Malaysia if it were to be implemented.

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