CBDC – an opportunity to support digital financial inclusion: Digital Student Safe in Hungary

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Abstract

CBDC has huge potential to improve the quality of and access to digital financial services, but it is also uncharted territory, a „moon landing" for central banks, where a decision requires great care. Therefore, when no urgent need is identified for a general use CBDC, careful but definite steps can help guide central banks to gain first-hand experience with targeted pilot projects having additional objectives. Hungary's central bank, the Magyar Nemzeti Bank (MNB), launched its first retail CBDC pilot project in September 2020 with a dual purpose: (i) to support digital financial inclusion of students; (ii) to gain hands-on experience on a potential operational model of a future CBDC system. When designing the Digital Student Safe pilot, we applied a seven-step decision-making structure that ensures a consistent conceptual framework appropriate to help design any future successful CBDC pilots or projects. In this case study we demonstrate how the framework was applied in practice and how the Digital Student Safe 1.0 programme was delivered for the benefit of both the general public and the central bank. Based on its success, further expansion is also being considered in the form of Digital Student Safe 2.0.

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1. Introduction: CBDC, an uncharted territory

The introduction of a central bank digital currency (CBDC) can support the achievement of several economic, policy and social goals. The theoretical literature on CBDC is already extensive, and several studies address the potential benefits and risks of issuing a CBDC (eg Group of Central Banks (2020)). Wholesale CBDC could reform interbank and cross-border payment and settlement, while retail CBDC could lead to the renewal of financial services and monetary policy. Motivations for some countries may differ depending on whether they are emerging or developed economies or based on other factors such as social or geographic characteristics.

One of the most prevalent motivating factors among central banks is the promotion of financial inclusion. This was one of the main motivations behind the issuance of one of the world's first general retail CBDCs, the sand dollar of the Bahamas (CBoB (2020)). It is also an important motivating factor to the People's Bank of China, which has a remarkably advanced pilot programme (PBoC (2021)).

In Hungary, the instant payment system was successfully introduced for the banking sector in 2020, and overall, currently we cannot identify an urgent need for launching a generally accessible, fully fledged retail CBDC. However, Hungary's central bank, the Magyar Nemzeti Bank (MNB) is keen to be at the forefront of CBDC research, and therefore, it needs to experiment with all possible dimensions of a CBDC project on a small, controllable scale. To serve this goal, the MNB has chosen a special programme which has two parallel objectives: (1) to facilitate digital financial inclusion of a special age group of 8–14-year-old students; and (2) to serve as a real-life CBDC pilot project for the MNB.

Financial inclusion can be defined in several ways. Simply put, it is the access to and use of formal financial services by households and firms (Sahay et al (2015)). There are several reasons why financial inclusion has come to the attention of central banks. Studies have shown that increasing financial inclusion can have a positive impact on economic growth and, with properly supervised financial services, can also enhance financial stability (Sahay et al (2015)). A deeper understanding of the overall level of a country's financial inclusion can be gained by examining three components: (i) access to financial services; (ii) usage of financial services; and (iii) the quality and cost of financial services (Jahan et al (2019)). All three components are equally important, which is why financial inclusion is a challenge even in developed economies. In the United States, despite the advanced financial infrastructure and wide-ranging access to financial services, 5.4% of households were unbanked in 2019 (Kutzbach et al (2019)). This shows that even in one of the most developed economies in the world, there is still considerable room for improvement in the field of financial inclusion.

Although the digitalisation of the economy and society has long been an identifiable process, the Covid-19 epidemic has unexpectedly accelerated it. The digitalisation of finances poses a new challenge to everyday users. It carries the danger that people will be unable to keep up with the constant technological change, digital knowledge will lag behind, and in addition to financial inclusion, societies will have to cope with digital exclusion as well. That is why not only financial inclusion alone, but digital financial inclusion is the new challenge.

Digital financial inclusion is also an opportunity to create a more inclusive and equal financial ecosystem. It is associated with higher economic growth, compared to

traditional financial inclusion (Sahay et al (2020)). The digital revolution can provide a more effective response to all three components of financial inclusion. Digital financial services can increase access to formal financial services by overcoming physical infrastructure barriers and providing a first entry point to the financially excluded (OECD (2017)). Digital solutions can also improve the quality and reduce the cost of financial services. New fintech players increase competition, forcing all players in the financial sector to continually improve the quality of their services and reduce the cost of use. The improvement in the use of financial services depends on the ability of customers to keep up with the ever changing technological innovations. That is why financial and digital literacy is a critical issue for digital financial inclusion.

2. Financial inclusion in Hungary

According to the Word Bank's Global Findex survey, in 2017, 75% of the population aged 15 and over had a bank account in Hungary. Based on data observed in previous years, an upward trend can be detected, and this number is expected to increase further. It is a matter of concern that among young adults (ages 15–24) this figure was only 60%, although in terms of online payment use, young adults are ahead of the general population. This means that a significant part of future generations uses financial services less, and a higher unbanked rate was also observed among the lower educated or rural population. The most important reason given by unbanked for their condition was the high costs of financial services, insufficient funds, or lack of trust in financial institutions. Overall, the data suggest that all three components of financial inclusion have room for improvement in Hungary (World Bank (2018)). An OECD survey conducted in 2019 examined the level of financial literacy of countries based on three components: (i) financial knowledge; (ii) financial behaviour (ie planning and acting with a conscious financial mindset); and (iii) financial attitude (ie having long-term financial safeguards and higher resilience to shocks). Based on the results, the overall level of financial literacy in Hungary is below OECD average. The best result received was in financial knowledge, while Hungary was one of the worst performers in terms of financial behaviour (OECD (2020)).

The results of the presented surveys show that progress is needed in Hungary on all components of financial inclusion, but the main challenge is to improve the active and frequent use of financial and especially digital financial services. This clearly suggests that practical routines and confidence in the online space and basic financial practices need to start at as early an age as possible.

3. The MNB's approach to financial inclusion in the digital age

We have previously shown that an appropriate level of financial and digital literacy and its continuous improvement is essential to promote digital financial inclusion. This can be achieved through comprehensive and modern educational programmes for all social groups. The MNB's consumer protection mandate involves the strengthening and raising of financial awareness and supporting the spread of

financial culture.[2] To achieve this, the MNB has several educational programmes through which it seeks to strengthen financial awareness among a wide range of individuals. The aim is to reduce the financial insecurity of the population and to encourage them to use financial services that meet their own needs.

In addition, as described in the previous chapter, the digitalisation of the financial system and the emergence of fintech services can further facilitate digital financial inclusion. To support the spread of innovative financial solutions and create a vibrant fintech ecosystem, the MNB launched the MNB Innovation Hub and Regulatory Sandbox in 2018, followed by the establishment of the Digitalization Directorate and the appointment of the Chief Digital Officer in 2019. Furthermore, the digitalisation of the existing financial system is also a strategic goal of the MNB. The launch of the instant payment system in 2020 was a milestone in the digitalisation of the Hungarian financial system. Unlike international examples, the MNB made joining the instant payment system mandatory for all domestic banks, in order to deploy the full potential of network effects. In 2021, the publication of the Recommendation on the digital transformation of credit institutions also served the purpose of accelerating the digitalisation of the financial sector in Hungary and widening the offer of end-to-end digital, widely accessible financial services to customers.

The MNB has recognised that CBDC experimenting may also create an opportunity to launch a special pilot programme on digital financial inclusion. Therefore, the central bank decided to launch its first retail CBDC pilot project, which: (i) is in line with the MNB's objectives set out in the MNB Act; (ii) promotes digital financial inclusion; and (iii) supports the MNB's intention to join the leading central banks in the field of CBDC research.

4. Digital Student Safe: a targeted retail CBDC pilot

For the moment, the MNB does not see any urgent need to set up an implementation project for a large-scale retail CBDC. Still, it wants to develop capabilities, build market and implementation knowledge, and get to know technologies in order to shorten the time to issue a CBDC when economic or policy need arises. It has therefore issued a pilot project combining the two policy goals of building a running CBDC pilot and supporting the digital financial inclusion of a special group, 8–14-year-old students.

Savings stamps have a long history in Hungary. Their first appearance dates back to the 19th century. The early savings stamp was a financial instrument that allowed people to have microsavings. Later, in the 1970s and 1980s, collecting savings stamps became popular in primary schools in Hungary. Collecting stamps with different designs and colours was a playful form of saving for students. At the end of the school year, students were able to redeem the savings stamps through their teachers. However, in the past three decades, this playful form of microsaving has disappeared from schools.

The Digital Student Safe mobile application is an attempt to make the once so popular financial inclusion format available to students again, while adapting it to the expectations of the modern, digital age. The mobile application has been available to students since September 2020. With the help of targeted communication and a

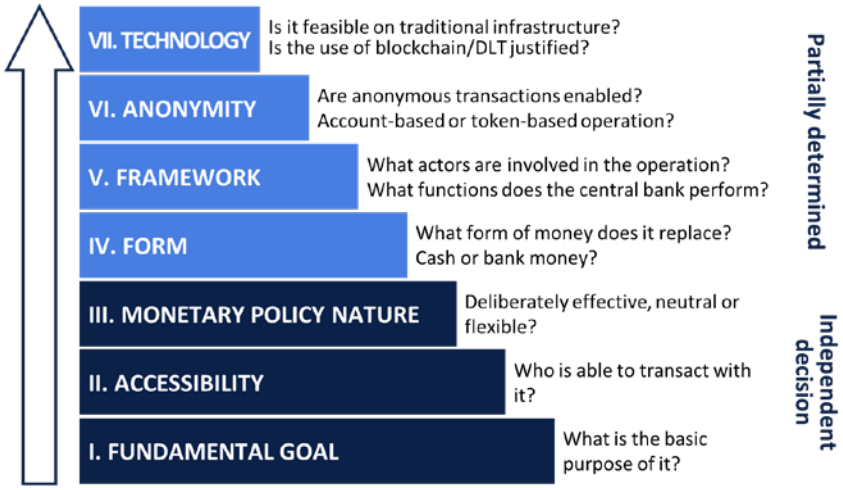
[2] Article 44 (3) of the Act CXXXIX of 2013 on the Magyar Nemzeti Bank.

direct marketing campaign, the central bank first selected 45 schools to invite for participation. With a step-by-step extension of the programme, now students from more than 100 schools are actively using the application. Based on their experiences and feedback, the further expansion of the Digital Student Safe project is now under development.

The Digital Student Safe is a publicly available mobile application, where students can set savings goals, exchange and collect digital assets (digital medals, digital stamps) by answering quiz questions about finance, digitalisation, and environmental awareness. Additional digital medals can be earned from parents as a gift or in return for the completion of some predetermined tasks/activities, all registered in the app. The digital medals or stamps are forming special series, eg on famous Hungarian kings or Hungarian castles. Therefore, the collection of the specific series of digital assets and the exchange of excess copies has an intrinsic value for the young collectors. The digital assets also represent a specific value expressed in so-called Student Tallér, and can be redeemed for material gifts like toys or sports equipment at the end of the savings period at a specific webshop. Several redemption periods have taken place since launch, and thousands of students registered, who completed more than 700,000 quizzes. According to development plans, in the next phase (Digital Student Safe 2.0) a more direct connection to real money is to be attained, while the targeted user base continues to provide a secure base for testing. As a result, additional CBDC-related functions can be tested as well, and valuable experience gained.

As part of its CBDC research the MNB has also published a comprehensive study volume entitled *At the dawn of a new age – money in the 21st century*. The volume summarises the theoretical considerations, the most important practical issues, the motives behind the potential creation of and the opportunities offered by this new form of money. As referred to in the study volume, seven distinct, consecutive decision steps can be identified that should be considered while designing a successful CBDC project (Graph 1). Below, we are going to demonstrate how the MNB's first retail CBDC pilot project, the Digital Student Safe, was designed using this seven-step decision framework.

Decision "steps" in designing a CBDC — Graph 1



Source: Fáykiss and Szombati (2021).

1. Fundamental goal

In this step, it should be clearly defined what is the motivation for the introduction of CBDC, what kind of market failure or shortcoming it aims to alleviate. The MNB's approach is unique in a way because it decided to closely link the first retail CBDC pilot project with the MNB's financial education objectives. The aim was to promote the adoption of certain forms of financial behaviour that can be established in childhood, such as setting financial goals and plans, exchange of digital assets and forming a regular saving habit. On top of that, with the constantly updated quizzes the central bank can help students and families acquire up-to-date financial, digital and sustainability knowledge. Through the widely supported and well targeted educative programme, valuable live testing experience with real-time customer feedback was also achievable, as an input to the retail CBDC project.

2. Accessibility

In this step, accessibility should be determined, ie which economic and social players will have access to the CBDC. The MNB is the first and so far only central bank to design its retail CBDC pilot programme around a specific social group not based on geographical location. The Digital Student Safe is targeting primary school students and their parents. The MNB chose the 8–14 age group because: (i) at this age group regular pocket money appears, and occasional or even regular spending occurs; (ii) however, the saving and spending usually takes place exclusively in cash; and (iii) children at this age already have smartphones, while they are legally deprived of having individual bank cards. Therefore, the programme targets both the students in this specific age group and their parents, who are primarily controlling and overseeing their children's activity in the app. Designed for students, the CBDC pilot is a unique opportunity for the central bank to improve the financial awareness of young people who are currently not having any bank relationship, but who in the future are expected to spend more and more and later also to have their own income. The programme first targeted 45 primary schools all around the country, and, in two consecutive steps, has now been extended to directly contacting more than 100 schools.

3. Monetary policy nature

In this step, the monetary policy framework should be defined, ie whether the CBDC would be an active, neutral or possibly flexible instrument for monetary policy, as well as any restrictions (eg on the amount that can be held in the account, transaction size or number). Digital Student Safe is a neutral instrument for monetary policy; it is not intended to be interest-bearing.

4. Form

In this step, the form of the CBDC should be determined, ie whether it would be account- or token-based and what kind of functions it might thus have. In the current phase, the use of the Digital Student Safe mobile application is subject to registration and it can be described as an account-based form.

5. Framework

In this step, the operational framework should be defined, ie which players are involved in the operation of the CBDC and what functions the central bank performs. One of the biggest challenges for central banks in CBDC operations is that they might need to perform functions that they traditionally do not. In order to be able to respond flexibly to this decision-making step in the future, the MNB has decided to

use a framework in the pilot programme in which the central bank provides a wide range of functions directly. This gives the MNB valuable experience in the field of customer relations, and it also implies dealing with legal challenges such as know-your-customer (KYC) or anti-money laundering (AML). The main purpose of the (still limited) framework is to test the operability of the possible functionalities of an actual retail CBDC pilot and to gain experience. However, CBDC being a completely new, innovative initiative at the society level, the MNB deems the involvement of commercial banks as well as other innovative players like fintechs as inevitable in some form for the future.

6. Anonymity

In this step, the issue of anonymity should be defined, ie whether it would be possible to carry out anonymous transactions and within what framework. In the current phase, the system operates in a pseudonymous manner, allowing users to register with a username, email address, and age. In addition, it implicitly uses "KYC": when the student wants to purchase gifts, additional information is required to complete the delivery by their school teacher.

7. Technology

In this step, the technology used should be defined, where it can be determined whether the system would work on the traditional infrastructure or whether it would be necessary to develop a new system (eg based on distributed ledger technology (DLT)). A potential CBDC project may require significant infrastructure development. In order to achieve the main goals of the Digital Student Safe, the development or implementation of a completely new technology was not a priority in the short term, but it is worthwhile to build the system in such a way that it is modular. One of the advantages of the Digital Student Safe CBDC project is that it can be flexibly developed according to different future needs.

Conclusion

Digital financial inclusion is one of the key challenges of the coming decades and needs to be improved to ensure a stable, secure and accessible financial ecosystem. The MNB's Digital Student Safe initiative is a unique innovation in its retail CBDC pilot nature, and aims to improve digital and financial literacy and, ultimately, digital financial inclusion. The seven-step decision framework proved to be a helpful tool in practice, facilitating the successful design of the Digital Student Safe pilot project. The most important takeaway is to use the framework step by step, starting with the most important step, defining the fundamental goal, and then deciding on further issues. CBDC projects can only be truly successful if the central bank sets clearly defined policy goals, and these goals also serve the interests of the users.

On top of serving as an effective tool to support digital financial inclusion, the Digital Student Safe pilot programme was invaluable as a retail CBDC experiment for the central bank as well. Primary registration and complaints handling processes were developed, proper front- and back-end functions started to be operated, flexibility and scalability have been tested, peer-to-peer transactions and webshop transaction functions have been developed and tested. Overall UX, UI and conceptual ideas were introduced to real-life customers, and their feedback was highly appreciated. As it has been so effective in delivering on both objectives, it is planned to maintain and

develop the Digital Student Safe programme further. With expanded reach, widened functionality and real money involvement, while maintaining the gamification and the family focus, we believe that the Digital Student Safe pilot programme can continue to both support digital financial inclusion and provide an opportunity for the MNB to gain hands-on experience on a potential operational model of a future CBDC system. According to plans, these extended functionalities under the Student Safe 2.0 programme will already be available in the 2022–23 school year.

The MNB is committed to continuing its research on CBDC and to successfully implementing its ongoing pilot initiatives, although no significant market failure or specific public policy goal can be identified that would make the widespread introduction of a retail CBDC in Hungary urgent. The MNB's current CBDC activities are a good basis to enable the issuance of a retail CBDC with sufficient conceptual, technological and practical readiness if economic or policy demand arises. The MNB is committed to actively involving market participants in the process and is actively seeking the opportunity to cooperate with the players of the domestic banking and fintech ecosystem in order to prepare them for the digital transformation and for the potential introduction of any form of CBDC.

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