Part II
Anniversary: The 100th Anniversary of the Establishment of the Magyar Nemzeti Bank (Hungarian Central Bank, 1924–2024)

Viable Solutions for the Introduction of Digital Central Bank Money in the EU

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Abstract

In 2023, 93 % of the world's central banks were considering the introduction of digital central bank money. This paper examines the definition of digital central bank money, its significance, possible forms and the risks of, as well as the legislative environment for its introduction in the EU. In the concluding part of the paper, the author also reviews the draft legislative package, the Digital Euro Package, published by the European Commission in June 2023, in which the legislator proposes to regulate the legal framework for the possible introduction of the digital euro. Central banks seem to provide important information only to the financial professionals. But from time to time, central banks come also in the spotlight. One such significant event could be the emergence of digital central bank money. By this article the author pays tribute to the 100-year-old Hungarian central bank, the Hungarian National Bank.

Keywords**:** CBDC, fiat money, DLT, DEAN, Digital Euro Package

1. Introductory Thoughts

Central banks are playing a crucial role in our life by providing trust and security in our financial system. Although usually it is a financial crisis when they come to centerfold, but from time to time, central banks can

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be for other reasons as well in the spotlight. Probably one such significant event will be the introduction of digital central bank money. With this article the author pays tribute to the 100-year-old Hungarian central bank, the Hungarian National Bank.

More than 93 % of the world's central banks are actively considering the introduction of central bank digital currency (CBDC) in 2023.[1] Already in 2019, the World Bank and the International Monetary Fund (IMF) started experimenting with a pseudo digital central bank currency.[2] China has been developing and testing a digital yuan since 2014.[3] The commitment to creating digital central bank currencies is illustrated by the fact that smaller economies, with different motivations, have embarked on unsuccessful and rather dangerous attempts to introduce new types of national currencies (the Marshall Islands in 2018, creating a sovereign national cryptocurrency and El Salvador adopting bitcoin as its official currency in 2021).[4,5] In parallel with this process, major economic powers such as China, the EU, Japan and Canada, already mentioned above, have been weighing up the pros and cons of introducing central bank digital currency since the second half of the 2010s. And in 2020, the US has also entered the race to adopt CBDC with the concept of the digital dollar – with the US dollar's role as

1 Anneke Kosse & Ilaria Matta, 'Making headway – Results of the 2022 BIS survey on central bank digital currencies and crypto', *BIS Papers*, No 136, at www.bis.org/publ/bppdf/bispap136.pdf.

2 Berman Ana, *IMF and World Bank Launch Quasi-Cryptocurrency in Exploration of Blockchain Tech,* at https://cointelegraph.com/news/imf-and-world-bank-launch-quasi-cryptocurrency-in-exploration-of-blockchain-tech?

3 Joel Slawotsky, 'US Financial Hegemony: the Digital Yuan and Risks of Dollar De-Weaponization', Fordham International Law Journal, Vol. 44, Issue 1, 2020, p. 86.

4 The problems during implementation can be traced back to two causes. One is that a cryptocurrency, which enjoys greater credibility *vis-à-vis* the national currency, which will continue to function as the official currency, could be forced out of circulation, devaluing the domestic currency. Another problem arises if an independent legal entity is entrusted by the government with the issuance and management of the new currency. It is no coincidence that the IMF has warned the Marshall Islands that the risks in this case significantly outweigh the potential benefits of implementation. Cali Haan, *Marshall Islands Promotes its SOV National Cryptocurrency Development Fund at UN Blockchain Summit in New York,* at www.crowdfundinsider.com/2019/06/148086-marshall-islands-promotes-its-sov-national-cryptocurrency-development-fund-at-un-blockchain-summit-in-new-york/.

5 *See* at www.reuters.com/world/americas/el-salvador-approves-first-law-bitcoin-legal-tender-2021-06-09/.

the world's currency in mind.[6] In June 2023, the European Commission proposed a legislative package, the Digital Euro Package, which would allow the legislator to create the legal framework for the possible introduction of central bank digital currency. In October 2023, the Governing Council of the European Central Bank announced that, following a two-year test phase, it would launch a preparatory period for the next two years.[7]

Financial technology service providers are now developing the first round of Fintech solutions for commercial banks. First, they offered cheaper digital solutions for lending, transfers and investments compared to traditional banking services. The second round of Fintech solutions brought new digital applications in the areas of regulatory compliance and insurance. The third round of Fintech services focus on blockchain technology, which typically attempt to cover and expand the full range of financial services through smart contracts and automated solutions in the context of Decentralized Finance (DeFi). While the first two Fintech solutions 'merely' cover the intermediaries of the financial system, central bank digital currency has the potential to transform the entire financial system, as the introduction of new money is not a simple change of form, but raises issues of substance beyond technological challenges, redefining the framework of monetary policy, up to the sovereignty of the national economy. The technologies used are still in their infancy, and in many cases the legislator is still in the process of developing regulation, but no state has yet implemented full regulation. Nevertheless, the global (internet-based) nature of the market means that there will be no opportunity to adopt mature technology and legal regulatory solutions, since it is precisely rapid change that may force entities into early adoption. Therefore, it is important to identify risks extensively, to use sufficiently robust (reliable) technology and to implement with caution. In addition, maintaining confidence in the financial system requires wide dissemination of information, gradual introduction, parallel operation with the maintenance of existing national currencies. This will enhance the financial freedom of less digitally literate entities, without infringing their rights, while at the same time enabling national economies to respond in a meaningful and timely manner to the

6 Shane Tews, *The potential of the digital dollar: highlights from my conversation with Jim Harper*, at www.aei.org/technology-and-innovation/the-potential-of-the-digital-dollar-highlights-from-my-conversation-with-jim-harper/.

7 *See* at www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr231018~1l1a014ae7.en.html.

challenge of introducing digital central bank money, the latter impacting significantly on their competitiveness.

Accordingly, the paper first reviews the concept of central bank digital currency and its importance in the financial system, then outlines the background to the introduction of central bank digital currency, and then describes the risks of introducing CBDC, followed by the pre-types and possible forms of CBDC. Finally, the paper will briefly elaborate on the characteristics of the digital euro that will emerge from the new legal environment created by the draft legislative package of the EU as the legal regulatory framework for the introduction of CBDC, with particular reference to anonymity and data protection.

2. Definition and Significance of Digital Banknotes and Coins

2.1. Definition of Digital Banknotes

Central bank digital currency is widely defined as central bank money in digital form, which is different from the traditional form of reserve and account balances.[8] It clearly follows from this definition, as defined by the BIS and the seven largest central banks, that central bank digital currency cannot in any way be implemented as a privately issued currency. In the case of fiat money, the State has a monopoly on the right to issue money, which it has entrusted to the central bank and which it should not give up in the future, precisely in order to exercise its monetary policy powers. Technological developments and the emergence of crypto-assets raise the possibility of a CBDC based on distributed ledger technology (DLT). However, DLT-based crypto-assets rely on an independent computer network, which, whether *proof of work* or *proof of stake,* does not allow the central bank to have full control over issuance, and thus a monopoly on issuance. The solution would be a computer network based on DLT but managed from a central office, or a similar network protected by encryption, which would operate with full control of the central bank in the future. The members of the this centrally controlled DLT network would be the primary dealers (in government securities) and those financial service providers, which authorized to deposit funds with the central bank.

8 Bank of Canada *et al.*, *Central bank digital currencies: foundational principles and core features,* Report No 1 in a series of collaborations from a group of central banks, 2020, p. 3.

This differs from the range of privately owned digital payment instruments such as Paypal or Ripple. In the case of Ripple, the computer network is centralized, so it is no coincidence that commercial banks are keen to work with the Ripple developer community on digital domestic and international payment solutions.[9] However, the advantage of DLT can undoubtedly be exploited by creating a centralized network of central bank ownership. This solution would have the advantage over the current two-tier banking system for fiat money in that its digital nature could make it faster and more efficient than the current form of fiat money to process international payments and deliver public transfers to recipients. In addition, DLT technology could allow for a more targeted use of monetary policy instruments, both in time and among users – precisely by involving smart contracts.

2.2. The Importance of Central Bank Digital Currency

A major driver for the introduction of central bank digital currency has been the emergence of crypto-assets at the intersection of finance and technology, whose limited, but increasingly widespread, monetary functions have broken down the boundaries of national economies. These quasi-payment instruments enable almost instant cross-border payments between continents. Crypto-assets and the blockchain technology that supports them give central bank digital currency a special significance in two respects. The emergence of Facebook with over two billion users with Deum[10] (formerly Libra) as a potential global digital currency and the emergence of stablecoins such as Tether and USDC are important catalysts for the rapid emergence of CBDC. The latter, stablecoins, seek to achieve the stability of the gold monetary system, *i.e.* to dampen the significant price volatility that is typical of crypto-assets, by issuing crypto-assets in the form of stablecoin backed by a stable portfolio of foreign exchange assets or gold collateral that is considered to be of stable value.[11] (For crypto-assets,

9 *See* at https://fintechzone.hu/ripple-kriptovaluta-blockchain-deviza-atutalas/.

10 *See* at https://developers.diem.com/docs/technical-papers/the-diem-blockchain-paper/.

11 Typically, gold and silver, but in China copper and silver. Milton Friedman & Anna J. Schwartz, 'Has government any role in money' *in* Anna J. Schwartz (ed.), *Money in Historical Perspective*, Oxford University Press, Oxford, 1987, p. 295.

daily movements of 15–20 % are not uncommon, nor is the loss of 85 % of the local peak market value within just a few months – as has been the case for Bitcoin over the past 15 years.) Stablecoins have become an attractive crypto money market asset due to their price stability (as taxable income is based on exiting the crypto-asset, so it is only advisable to exit the crypto ecosystem as a last resort). This affords stablecoins a similar role as highly liquid money market funds in the crypto-asset market, with the latter having a market capitalization (market value) of almost USD three billion. For money market funds, the unsustainable level of the assumed fixed net asset value of USD 1, as an unsubstantiated assumption, caused significant liquidity problems during the 2007–2009 crisis, threatening the global financial system.[12] This problem could reoccur with stable money in the crypto-asset market, the fundamental difference being that in this case not only is redemption at a fixed USD 1 no longer feasible, but redemption cannot take place due to a lack of sufficient liquidity. In this case, the default may be triggered by the fact that there is no full foreign exchange cover or that the foreign exchange or precious metal collateral is invested in less liquid assets than the cash and government securities in the course of the operation of the stablecoin.

The above suggests that central bank digital currency is a digital version of the current fiat money. An important difference is that it is not just a new form of electronic money in the form of CBDCs, but an implementation of digital fiat money based on blockchain or similar technology. The technological basis is in the content of the smart contracts, in particular the fact that this form permits the implementation of the pre-programmable money feature, which allows for the very rapid issuance of money and without the need for new technology, new or differently functional issuance of money (further issuance of money) in a very short time (even minutes), instead of the previous days or weeks required for postal services.

The above makes it necessary to create a competitor for this global competitor, which will be the central bank, the sole manager of the monetary

12 The bankruptcy of Lehmann Brothers on 15 September 2008 not only led to the collapse of the commercial bond market, but also to the demise of the Reserve Primary Fund, the first money market fund, with the Reserve Primary Fund failing to maintain a net asset value per unit of USD 1 for the first time on that day. On 14 October 2016, new money market fund regulations in the US came into force to prevent this false sense of security by replacing the previous fixed (USD 1) NAV calculation system with a mandatory flexible NAV calculation for institutional primary funds and tax-exempt municipal money market funds.

policy. The other factor that raises the need for CBDCs *vis-à-vis* stablecoin is the need to maintain the dominance of fiat money instruments. This could take the form of central bank digital currency, or a set of money market instruments denominated in such currencies. Without this, there is a real risk that the predominance of decentralized (DLT-based) financial instruments could drastically reduce the effectiveness of monetary policy, which could have a destabilizing effect on the economy.

3. The Risks of Introducing Central Bank Digital Currency

3.1. The Monetary Policy Risks of Introducing Central Bank Digital Currency

Central bank digital currency presents many opportunities for monetary policy, but also new challenges. A form of CBDC without a financial intermediary (centralized CBDC), where the central bank would directly hold the accounts of all entities, including households and businesses, would be a significant administrative burden on the central bank, even with the possibilities offered by modern technology. The reintegration of commercial banks into central banks, *i.e.* a single-tier banking system, would be feasible only at considerable risk, precisely because of the diversity of the banking system and the weight of money market funds. What definitively renders this form of CBDC unfeasible is precisely the well-established system of monetary transmission in the two-tier banking system, where financial intermediaries implement elements of the central bank's monetary policy with respect to individual market participants. Financial intermediaries implement monetary policy objectives through channels such as credit and monetary aggregates, interest rates, asset prices and market interest rates. In the absence of an intermediary system, the central bank's role as lender of last resort would theoretically be fulfilled towards itself. The use of this instrument of last resort would leave scope for excessive central bank intervention: in effect, direct monetary (self-)financing of the public budget, sometimes without even a proper assessment of the risks involved.

3.2. The Social Risks of Introducing Central Bank Digital Currency

The main risk of central bank digital currency is a loss of confidence in the financial system. This can take the form of a lack of confidence in the new currency, but also a loss of existing financial confidence.

One of the key arguments for the introduction of CBDC is its potential to involve hundreds of millions of underserved people globally. The reason why the pool of people excluded from financial services is so wide is that low-income people find it unattractive or financially unaffordable to have accounts with traditional banks, but they are also not part of the potential target market for financial service providers themselves. The problem may be exacerbated by functional or total illiteracy. However, high mobile phone penetration can provide extremely cheap access to technology, physical distance and even the ability to deal with illiteracy problems. In this segment of society, building and maintaining trust is particularly difficult, as illustrated by the challenges faced during Covid-19 vaccination. It is therefore important to gradually build and maintain this trust through the gradual introduction of a robust, reliable, identifiable CBDC in parallel with a fiat national currency.

Trust in the financial system is also fragile, especially if a currency is introduced too quickly, or is not preceded by adequate education, or where there is a failure to achieve a breakthrough in the use of the new type of money among commercial service providers and consumers.

4. Pre-types and Possible Implementations of Central Bank Digital Currency

4.1. Pre-types of CBDC

For CBDC, crypto payment instruments such as Bitcoin and Ripple can serve as a forerunner. However, these blockchain-based payment instruments are only partially competitive with today's cross-border international payment systems in terms of speed. Indeed, crypto payment instruments offer a significant competitive advantage over international instant payments, such as SWIFT-based multi-day transfers. However, with thousands of transactions per second, only the third generation crypto device Solana can compete with cashless payment systems (VISA, Mastercard, Paypal)

with its speed of 65,000 transactions per second, which is exactly the same as the processing speed of a VISA transaction.[13]

The central banks themselves provide an example of a pre-type of digital currency with the instant settlement system RTSG.[14] In the US, the Federal Reserve wired transfer network (Fedwire) and the New York Clearing House Interbank Payment Systems (CHIPS), and in the Eurosystem, the EU's euro-based instant digital settlement system TARGET2 play this role.[15] For the EU, TARGET2 is used to settle the equivalent of the total GDP of the euro area on a weekly basis, involving nearly a thousand financial service providers. However, the fact should not be overlooked that the participants are professional financial service providers who operate the highly cyber-secure computerized system and settle in a short time and, moreover, they already have a significant trust in each other as members of a system that has been in operation for over 20 years.

4.2. Possible Forms of CBDC Implementation

Looking at the possible types of CBDC, the range of possible types is two to two variations of four aspects, so that the current number of realistically feasible alternatives is eight.[16]

There are two basic types of fiat money, according to the form in which they are presented: money in the form of an account receivable and money with a separate physical appearance (tokens). In the case of the former, although the financial settlement of the transaction takes place immediately, the actual financial settlement is only made at a later stage. An example of the former is the immediate virtual settlement of a purchase by credit card, where the funds are credited to the merchant's account only a few

13 Szilárd Márton, A Solana és a harmadik generációs blockchain hozhatja el a bitcoin végét?, at https://concordeblog.hu/2021/08/30/a-solana-es-a-harmadik-generacios-blockchain-hozhatja-el-a-bitcoin-veget/.

14 RTSG (Real Time Gross Settlement) is an instant digital settlement system developed by central banks since 1975 and now used by 90 central banks, which has been further developed to operate not only in the form of cash settlement but also in the form of securities settlement. *See* at www.bis.org/cpmi/publ/d22.pdf.

15 Steven L. Schwarcz, 'Regulating Digital Currencies: Towards an Analytical Framework', *Boston University Law Review,* Vol. 102, Issue 4, 2022, p. 1079.

16 Wouter Bossu *et al.*, *Legal aspects of Central Bank Digital Currency: Central Bank and Monetary Law Considerations,* IMF Working Paper No. WP/20/254, November 2020, pp. 9–10.

days later. In contrast, money with its own physical appearance, like cash, is transferred to the other party either at the time of payment or in the form of a physical representation of the money (electronic data overlay). Central bank digital currency can also appear as a digital form (in the form of computer data) among the moneys with its own physical appearance, but also as a claim based on the RTSG systems mentioned above as a settlement instrument. In this respect, the account-based CBDC is embodied in the digital dollar,[17] the token-based CBDC is embodied in the digital euro,[18] while the Chinese digital yuan (Digital Currency Electronic Payment – DCEP)[19] attempts to combine the advantages of both in a part token, part account form.

There are also two types of accounting: centralized and decentralized accounting. The decentralized, non-centralized, typically blockchain-based, acceptance of central bank digital currency as legal tender already carries significant risks, mainly in terms of cyber security. Blockchain-based CBDC is feasible in a centralized form but requires an adequately secure infrastructure to be developed and operated under central bank ownership. In this respect, despite the higher initial cost, the centralized form is a realistic alternative to maintain the issuance of money and thus control over monetary policy.

In terms of issuance, the two types that can be distinguished are the single-tier, central bank-issued CBDC; and the two-tier, CBDC, the latter being created by recognizing commercial bank-issued debt as a liability of the central bank. Both versions may be relevant because of similar risks. However, in the case of a two-tier CBDC, a clear legal guarantee of full central bank commitment is needed to build confidence in the financial system for the new money, as mentioned above. As regards issuance, a third version exists in principle, where the central bank makes a full commitment to the tokens of a private issuer, but this form is only a theoretical assumption for several reasons. On the one hand, this solution would also imply a partial renunciation of monetary policy autonomy. On the other hand, the central bank would not only give up the benefits of printing money

17 Charles H. Giancarlo *et al.*, *The Digital Dollar Project. Exploring a US CBDC*, May 2020, at www.banking.senate.gov/imo/media/doc/Giancarlo%20Testimony%20Addendum%206-30-202.pdf.

18 Central Bank Digital Currencies and a Euro for the Future, A Thematic Report Prepared By The European Union Blockchain Observatory & Forum, 2021.

19 David Pan, *CoinDesk 50: How the People's Bank of China Became a CBDC Leader,* at www.coindesk.com/coindesk-50-how-peoples-bank-china-became-cbdc-leader.

(seniorage) when setting up this CBDC, but would also lose the possibility of regulating the money supply.[20]

The fourth approach to CBDCs is to issue either general purpose or retail CBDCs or limited CBDCs based on the user base of the members of the central bank's digital clearing system (wholesale). General use goes beyond the current central bank clearing circle and could provide those excluded from financial services with access to the new currency.

From the above, we may conclude that two of the two alternatives of the four types of CBDCs are not really realistic alternatives, since the limited-use type already exists (see RTSG) and performs well in a limited range but is not suitable for attracting a large and financially excluded population. The private-issue CBDC does not yet, *de jure*, meet the conditions for becoming a legal tender and is not even suitable for implementing central bank monetary policy in the absence of full control over the money supply. However, it is also clear that a combination of the benefits of account-type CBDCs with blockchain tokens is likely needed to build and maintain financial confidence, in order to achieve broad transparency and to maximize the benefits of technology.

5. Legal Possibilities for the Introduction of Central Bank Digital Currency in the European Monetary Union (EMU)

5.1. Legal Options for the Introduction of CBDC in the EMU prior to the Digital Euro Package

The financial system of the EU, the EMU, in the absence of full accession by all Member States, presupposes the dual monetary system of the euro and the national currencies of the non-Eurozone Member States over a longer period of time. The link between the two currency groups is established by the European Central Bank: by the duality of its governing bodies (Executive Board and Board of Governors) and by the coordination of the common monetary policy and the supervision of the financial system. It is therefore necessary to talk separately about the digital euro as a single currency and the digital currencies of the non-Eurozone countries.[21] While the digital euro is in competition for the role of global currency, the CBDCs of

20 Friedman 1987, p. 295.

21 The digital euro outlined in the Digital Euro Package will be available to natural and legal persons in all EU Member States, although payment service providers from

the non-member countries cannot participate in this competition because of their negligible economic strength. However, besides this apparent disadvantage, this also serves as an advantage in that the non-Eurozone Member States (including Hungary) can continue to pursue an independent monetary policy, which the CBDC can maintain and reinforce. In what follows, the paper first presents the general legal regulatory options for the digital euro.

When examining the EU acquis, the choice of primary EU law on which to base the CBDC issuance depends on the form of the digital euro and the purpose of its issuance.[22] If the digital euro were to be issued with a limited scope of use, *i.e.* only available to central bank customers, the Eurosystem could invoke the TFEU chapter on monetary policy as a legal basis, according to which the ESCB (European System of Central Banks) is responsible for the definition of monetary policy and the smooth operation of the payments system.[23]

If the digital euro were to be issued by the ESCB as a two-tier and general retail CBDC, *i.e.* issued through accounts held at the Eurosystem and thus also available for use by households and private entities, the legal basis in the Eurosystem would also be the primary legislation governing the ECB's operations.[24] The legal basis for the two-tier issue would be the provision on clearing and payment systems in the Statute of the ESCB and the ECB.[25]

If the digital euro were to be created in a centralized form for the clearing system and to have a limited use, *i.e.* to be issued only as a means of settlement for specific types of payments, processed by a dedicated payment infrastructure accessible only to eligible participants, the most appropriate legal basis would again be primary legislation[26] and the provision on clearing and payment systems in the Statute of the ESCB and the ECB.[27]

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non-euro area Member States will be subject to the rules set out in the Digital Euro Package, thus ensuring full protection against money laundering and terrorist financing. *See* Proposal for a Regulation of the European Parliament and of The Council on the provision of digital euro services by payment services providers incorporated in Member States whose currency is not the euro and amending Regulation (EU) 2021/1230 of the European Parliament and the Council Preamble, Sections 4–5.

22 European Central Bank, *Eurosystem: Report on digital euro,* November 2020, pp. 24–26.

23 Article 127(2) TFEU.

24 Id.

25 TFEU, Protocol No. 4, Article 17.

26 Article 127(2) TFEU.

27 TFEU, Protocol No. 4, Article 22.

If and when the digital euro is issued as an equivalent to a banknote, *i.e.* as a token-type CBDC, the most appropriate legal basis for issuance would no longer be the above-mentioned legislation, but the TFEU provision on the ECB's and national central banks' monopoly on the issuing of banknotes,[28] again, in conjunction with the Statute of the ESCB and the ECB.[29]

On the basis of the above, it can be concluded that the TFEU provision on the monopoly for banknote issuance[30] and the reference to it in the banknote issuance provisions of the Statute of the ESCB and the ECB[31] would give the Eurosystem a very wide margin of discretion to issue different types of CBDCs.[32] It is also important to note that within the Union, only the Governing Council of the ECB is empowered to authorize the issue of euro banknotes. Given the ECB's independence, it cannot be obliged to do so by any other EU institution, and therefore only this ECB body can decide on the introduction of CBDCs.[33] Since the ECB and the national central banks are entitled to issue banknotes accepted as legal tender, the TFEU's monopoly on banknote issuance does not allow for the introduction of private tokens as legal tender with a central bank commitment, nor the central bank commitment necessary for becoming a CBDC.[34]

It can be concluded from the above that all eight possible forms of central bank digital currency could have been included in the euro by amending central bank regulations[35] even before launching the Digital Euro Package.

28 Article 127(2) TFEU.
29 TFEU, Protocol No. 4, Article 16.
30 Article 128(1) TFEU.
31 TFEU, Protocol No. 4, Article 16.
32 European Central Bank 2020, pp. 24–26.
33 Article 128(1) TFEU.
34 Zsolt Bujtár, 'A digitális jegybankpénz bevezetésének kihívásai Magyarországon és az Európai Unióban' *in* Bence Kis Kelemen & Ágoston Mohay (eds.), *A technológiai fejlődés jogi kihívásai: Kézikönyv a jogalkotás és jogalkalmazás számára*, PTE ÁJK, Pécs, 2021, pp. 34–36.
35 Article 128(1) TFEU and Article 16 of Protocol No. 4 on the Statute of the European System of Central Banks and of the European Central Bank.

5.2. A Stand-alone Digital Euro Package as the Next Step in the Regulatory Process

In October 2023, the Governing Council of the European Central Bank announced the start of a preparation phase of two years following the two-year investigation phase.[36]

The aim of this preparation phase is to lay the foundations for a possible digital euro: by finalizing the rulebook and selecting the service providers that will develop the digital platform and defining the development framework for the infrastructure that will operate and support the digital euro.

In support of this process, the European Commission published a legislative package proposal, the Digital Euro Package, in June 2023. The legislative package consists of a Regulation establishing the legal framework for a possible digital euro (Proposed Digital Euro Regulation), a Regulation on the provision of digital euro services by payment services providers incorporated in Member States whose currency is not the euro and a Regulation on the legal tender of euro coins and banknotes (Proposed Legal Tender Regulation). In the legislative process, the European Central Bank would have the possibility, after approval by the European Parliament and the Council, to introduce a digital euro market alongside the current euro fiat money, if and when the European Central Bank takes a positive decision.[37]

Looking at the legal framework, it is important to note that the European Commission's Digital Euro Bill proposal takes into account not only the existing PSD2,[38] but also the amendments to the Payment Services Directive 3 (PSD3) and Payment Services Regulation (PSDR), which will enter into force later. It further takes account of the Directive on the prevention of the use of the financial system for the purpose of money laundering or terrorist

36 *See* at www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr231018~111a014ae7.en.html.

37 *See* at www.cliffordchance.com/content/dam/cliffordchance/briefings/2023/07/what-does-the-european-commissions-digital-euro-proposal-mean-for-the-future-of-money-in-the-eu.pdf.

38 Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directives 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC.

financing (AMLD5)[39] and the amendments to the AMLD6 and AMLR, which are expected to enter into force later.

5.2.1. Characteristics of the Digital Euro

Following the completion of the European Central Bank's test phase for the introduction of the digital euro in 2023, the main characteristics of a potential digital euro have been summarized at the end of the preparation phase:[40] widely accepted and easy to use; free for basic use; usable for any digital payment in the euro area; not requiring an online connection (it can also be used offline); offering the highest possible protection of privacy; inclusive, leaving no one behind; settling payments instantly; secure; risk-free (just like money issued by the central bank); usable for payments at the point of sale and person-to-person.

From among the above, three important factors need to be highlighted. First and foremost, the digital euro will also be a currency issued and accepted by the European Central Bank and, if approved, will be equivalent to the euro banknotes and coins currently in circulation.[41] The second most important factor is that it will provide its users with the highest level of data protection.[42] Finally, it will also be directly usable offline up to a pre-loaded limited amount of money.[43] It can be concluded from the above and from the summary of the preparation phase that the digital euro will be retail in terms of users, decentralized in terms of settlement, tokenized in terms of appearance and centralized in terms of issuance, with strong cryptographic elements, but not necessarily using DLT technology.

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39 Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing, and amending Directives 2009/138/EC and 2013/36/EU

40 *See* at www.ecb.europa.eu/euro/digital_euro/investigation/profuse/shared/files/dedocs/ecb.dedocs231018.en.pdf, p. 3.

41 European Central Bank, *A stocktake on the digital euro,* Summary report on the investigation phase and outlook on the next phase, 18 October 2023, p. 8.

42 "[T]he settlement infrastructure would not be able to trace the information to back a specific user thanks to hashing and other cryptographic techniques." Id. p. 39.

43 Id. pp. 11–14.

5.3. Data Protection Aspects

Of the digital central bank currencies, the Chinese is considered the most likely competitor to the digital euro, but the Chinese central bank digital currency is also noteworthy for being the one that is closest to widespread adoption. According to Zetzsche *et al.*,[44] one of the two systemic catalysts for central bank digital currency is precisely the Chinese central bank digital currency. The Chinese central bank set up a research group almost 10 years ago, in 2014, to study the feasibility and practical use of central bank digital currency.[45] And in 2019, the Digital Currency/Electronic Payment (DCEP) was tested, albeit on an experimental basis.

The Chinese central bank research team's summary[46] identified the need for a retail payment instrument as the reason for the creation of the DCEP, namely a digital payment instrument that is secure, inclusive and capable of meeting the needs of the digital age. Consequently, the DCEP has a dual role as a digital currency: in addition to its digital form (Digital Currency), it also serves as an Electronic Payment.[47]

A DCEP is both an account and a token, *i.e.* a hybrid form that can have different denominations and is created through a series of crypto-assets.[48] This latter fact allows us to assume that DCEP is DLT-based, as this is not explicitly discussed in the DCEP White Paper.

Despite advanced testing, DCEP still faces serious barriers in international financial markets. Just as the spread of the traditional version of the Renminbi is hampered by capital controls, a virtually fixed exchange rate

44 Dirk Andrea Zetzsche *et al.*, 'Sovereign Digital Currencies: The Future of Money and Payments?', *University of Hong Kong Faculty of Law Research Paper,* No. 2020/053, p. 5.

45 Mahima Duggal, *The Dawn of the Digital Yuan: China's Central Bank Digital Currency and Its Implications,* Institute for Security and Development Policy, Stockholm-Nacka, 2021, p. 20; Michael A. Peters *et al.*, 'Cryptocurrencies, China's sovereign digital currency (DCEP) and the US dollar system', *Educational Philosophy and Theory,* Vol. 54, Issue 11, 2022, pp. 1713–1719.

46 People's Bank of China, *Progress of Research & Development of E-CNY in China*, Working Group on E-CNYE Research and Development of the People's Bank of China, July 2021, at www.pbc.gov.cn/en/3688110/3688172/4157443/4293696/20210716145846918 71.pdf, 3.2, p. 8.

47 Id. p. 3.

48 Id. 3.2.1, p. 7.

regime and the fragmented nature of the money and capital market,[49] the same constraints apply to central bank digital currency.

In the case of DCEP, another factor that hinders trust is the perceived or real lack of anonymity. The PBOC has committed not to disclose data to third parties and to provide dedicated staff for data management and a firewall to implement security and privacy procedures.[50] However, this may not be sufficient to exclude access by the state to data generated by the use of the DCEP, which may later serve as a basis for, or be a part of financial behavior models.

The European Central Bank's anonymity project[51] has been investigating the creation of a CBDC issued by the central bank with cash-like characteristics, using a two-tier control structure that is partially anonymous and ensures the combating of money laundering and the fight and against the financing of terrorism. This is important because it will enable it to offer a secure solution, in line with the legislation in force (and in particular with the legislation in preparation to combat money laundering and terrorist financing – see above), which will help build and maintain trust. This latter trust is important for two reasons, not only to ensure that end-users actually use the digital euro, but also to ensure that it is capable of expanding the monetary toolbox.

User data protection is already well supported by the digital euro infrastructure through the use of chip technology[52] and by specifically limiting the use of data by payment service providers.[53]

The digital euro will be available to a wide range of end-users following the onboarding process after the introduction of the digital euro, who will either be natural persons or business users. Onboarding is the process when an end-user uses the digital euro for the first time. For natural person end-users, when they first interact with a payment service provider with the digital euro, the payment service provider will carry out the identification

49 Eszter Boros & Marcell Horváth, 'Digitális renminbi: szintlépés az USA-Kína geopolitikai versengésben?' *in* Ádám Banai & Benjámin Nagy (eds.), *Egy új kor hajnalán – pénz a XXI. században*, Magyar Nemzeti Bank, Budapest, 2021, pp. 68–94.

50 People's Bank of China 2021, 3.2.5, p. 7.

51 European Central Bank, Exploring anonymity in central bank digital currencies, 2019/4, pp. 10–11.

52 "A tamper-proof chip with pre-installed software that can store confidential and cryptographic data and run secure applications." European Central Bank 2023, p. 13.

53 "[…] the settlement infrastructure would not be able to trace the information to back a specific user thanks to hashing and other cryptographic techniques." Id. p. 39.

process by adding the KYC function and assigning a unique digital euro account number (DEAN) to the new end-user.[54] In addition to the latter, it will also be possible to use other identifiers and to request a physical card, and access to the digital euro application for each online and offline transaction will be granted to the new natural person who joins the digital euro as a completion of the onboarding process.

For business users, the above process can be carried out by issuing several DEANs for several service contracts. An extension of the service is also offered, allowing the use of digital euros at POS or virtual terminals and access to digital euros.[55]

The above processes are important from the perspective of data protection because only a limited amount of data is required to process payment transactions. The ECB's anonymity project has also identified additional data protection options (such as rotating public keys, zero-knowledge proof and enclave computing) for the use of shared ledger technology in digital euro payments.[56] For offline transactions, due to their small amount, the legislator would require an even lower level of identification, similar to small cash transactions.[57]

In the case of the digital euro, offboarding is also an important part of the end-user's process of using the digital euro.[58] This is when the digital euro balance is transferred to the end-user's bank account. Before the application that enables the use of the digital euro payment service would become unavailable, it will be necessary to remove the possibility of incoming and outgoing digital transactions that are pending or ongoing, similar to a payment account closure in the current practice.

Inclusiveness is an important objective and feature of the digital euro, as it is for central bank digital currencies in general. The access of potential end-users to traditional banking service providers is more limited due to limited geographical and educational access on the Asian and African continents. Nevertheless, in the case of the digital euro for end-users, the European Central Bank intends to make payment by app available to those for whom traditional banking is too expensive or unavailable and thus to ensure the possibility of using the digital euro for payments between

54 Id. pp. 19–20.
55 Id. p. 20.
56 Id. p. 11. European Central Bank 2019.
57 Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro, Article 37.
58 European Central Bank 2023, pp. 21–22.

natural persons and business service providers, between natural persons and natural persons, and between public authorities and natural persons.

6. Conclusion

The study explored the drivers for the introduction of central bank digital currency and, after presenting its background, the paper elaborated on the possible theoretical alternatives of a central bank digital currency that is also fit for the challenges of the digital age. Finally, the author examined the legal environment of the digital euro, noting that the possibilities for the introduction of the digital euro were already available before the Digital Euro Package of 2023. The Package makes a clear proposal for a retail-like centralized CBDC, maintaining and even expanding the infrastructure for the operation of the digital euro to digital payment service providers. This is implemented in such a way that data protection and anti-money laundering considerations are also given high priority. The ECB is not expected to take a decision on the introduction of the digital euro until the end of 2026 at the earliest, after a further two-year assessment period.