

Data di pubblicazione: 21 novembre 2023

ANA MARIA FAGETAN*

*Central bank digital currencies. A critical assesment of
regulations around the world*

ABSTRACT: Central bank digital currencies are no longer a matter of “if” but rather a matter of “when”, particularly if one considers their geopolitical implications. The main goal is to effectively assess the motivations, advantages and disadvantages behind the CBDCs initiatives, while also addressing the key concerns emerging from the implementation, regulation and supervision of CDBC, so that they can turn into the backbone of an efficient, innovative digital payment system. The article focuses on central bank digital currencies (“CBDC”) from a regulatory point of view, critically examining the current progress of CBDCs across the globe, with major focus on eNaira, e-Yuan, Digital Pound, the Digital Dollar and the Digital Euro. The investigation will also highlight the content of the Regulation proposals presented by the European Commission on 28 June 2023.

KEYWORDS: CBDC; eNaira; e-Yuan; Digital Pound; Digital Dollar; Digital Euro; regulation; European Central Bank.

SUMMARY: 1. Introduction. - 2. Literature review. - 2.1. CBDC Definitions. - 2.2. CBDCs pros and cons. - 3. CBDCs initiatives around the world. - 3.1. eNaira. - 3.2. e-CNY. - 3.3.E-Pound 3.4. E-Dollar. - 3.4.1. General Perspective. - 3.4.2. Legal Comments. -3.5. The Digital Euro. - 4. Legal Considerations Regarding a Digital Euro. Controversies. 5 – Conclusions.

1. Introduction

Digital transformations caused fundamental changes in the payment architecture, contributing to the formation of unregulated, opaque or weakly regulated sectors in which crypto-assets circulate¹, further leading to systemic risks². Regulators seek to monitor and minimize the risks associated with the functioning of the digital finance, in particular, by introducing central bank digital currencies, which can potentially provide

* Ph.D. Banking and Finance, Queen Mary University of London; Docente inc. di *Banking and Financial Regulation* presso l'Università "La Sapienza" di Roma.

¹ Van der Linden, T., & Shirazi, T. (2023). Markets in crypto-assets regulation: Does it provide legal certainty and increase adoption of crypto-assets?. *Financial Innovation*, 9(1), 22.

² Azar, P. D., Baughman, G., Carapella, F., Gerszten, J., Lubis, A., Perez-Sangimino, J. P., ... & Rappoport W, D. E. (2022). The financial stability implications of digital assets. *FRB of New York Staff Report*, (1034).

greater stability, security, accessibility and lower transaction costs. The key objective that the developers of digital currencies of central banks (CDBC) set before themselves currently is the establishment or tailoring³ of a regulatory framework⁴ in this era of digital transformations, as we shall see further on. BigTech companies⁵ also challenged the financial system, competing with traditional banks⁶ this standing as a further manifestation of how the digital era is profoundly remodeling money and finance⁷.

The world constantly shifts towards electronic payments which also impacts the decline in cash⁸. Nowadays, it is accepted that the world is moving towards a cashless society, and the quality of these financial and institutional transformations is positive. Central banks today are in difficult conditions, as the monetary environment is increasingly difficult to regulate due to the use of innovative liquidity circulation mechanisms and new means of payment in the form of cryptocurrencies. The growing interest of market subjects in conducting operations in non-institutionalized spaces stimulates regulators to analyze the possibilities of

³ Corbet, S. (2023). Introduction to the Review of Corporate Finance, Special Issue on 'Cryptocurrencies and Monetary Policy'. *Review of Corporate Finance*, 3(4).

⁴ Michail, N., & Selvadurai, N. (2023). Towards an Effective Regulatory and Governance Framework for Central Bank Digital Currencies. *Stan. J. Blockchain L. & Pol'y*, 6, 189.

⁵ Google, Microsoft, Amazon, Apple, Facebook.

⁶ Müller, J., & Kerényi, Á. (2022). The Rise of Central Bank Digital Currencies. *Financial and Economic Review*, 21(3), 122-148.

⁷ Usher, A., Reshidi, E., Rivadeneyra, F., & Hendry, S. (2021). *The positive case for a CBDC* (No. 2021-11). Bank of Canada; Ozili, P. K. (2023a). Central bank digital currency research around the World: a review of literature. *Journal of Money Laundering Control*, 26(2), 215-226.

⁸ Bibi, S., & Canelli, R. (2023). The interpretation of CBDC within an endogenous money framework. *Research in International Business and Finance*, 65, 101970.

introducing digital currencies into circulation. At the same time, in most countries, which have been conducting deep analysis for a long time, there is no final certainty regarding the very fact of the development of such a revolutionary digital currency.

Lately, due to several sweeping events, the governments and multinational organizations have been urged into investigating the feasibility of developing retail digital currencies to be used both for domestic and international payments. There were three main situations which prompted the possibility for a “retail” digital currency development.

First, the Chinese government, through the People’s Bank of China (PBOC) has canalized its efforts since 2014 towards the release of a retail digital currency known under the name of a Digital Currency Electronic Payment (DCEP)⁹, the program being launched in 2020.¹⁰ Currently, this digital currency is in the most advanced stage of development, globally speaking.¹¹ Second, the emergence of innovative forms of private digital money, and in this vein can be mentioned Facebook’s Diem (at first known under the name of Libra, rebranded in 2020¹²), a project which was supposed to create a digital currency, drew the attention of many

⁹ Also known as China e-CNY or digital Yuan.

¹⁰ Gladstein, A. (2021). Financial Freedom and Privacy in the Post-Cash World. *Cato J.*, 41, 271.

¹¹ For more information see Fanusie, Y., J., & Jin, E., (2021). China’s Digital Currency. Adding Financial Data to Digital Authoritarianism. *Energy, Economics & Security*. Center for a New American Security. Washington D.C., p. 11; Kshetri, N. (2023). China’s digital yuan: Motivations of the Chinese government and potential global effects. *Journal of Contemporary China*, 32(139), 87-105. <https://doi.org/10.1080/10670564.2022.2052441>.

¹² Technically, the issuer of Libra was the Libra Association.

regulators, central banks, and prominent political figures¹³ (Donald Trump) which voiced their concerns regarding “the threat to countries’ monetary sovereignty, financial stability, and systemic financial risks, consumer protection, the potential for marketing dominance abuse, privacy concerns resulting from Facebook’s dubious reputation given the previous scandal, and lack of explicit compliance undermining global regulatory efforts, especially in money laundering.”¹⁴ Libra was meant at first for the ‘unbanked’ people, as a substitute to cash, but what raised more worries was the users active on Meta platform, which were estimated to being almost three billion¹⁵, to a certain extent overlapping with the unbanked individuals, for sure.

Last, the COVID-19 pandemic encouraged cashless payments with the main aim to control transmission of the virus, this bringing forward the possible benefits of CBDCs,¹⁶ at the same time stimulating the necessity

¹³ Taskinsoy, J. (2023). The New Possible Trinity: Supranational Currency, Capital Mobility, and Monetary Independence, pp. 7-8. <http://dx.doi.org/10.2139/ssrn.4373812>.

¹⁴ Sethaput, V., & Innet, S. (2023). Blockchain application for central bank digital currencies (CBDC). *Cluster Computing*, p. 3.

¹⁵ Pupilizio, I. (2022). From libra to diem. the pursuit of a global private currency. *Global Jurist*, 22(2), 281-306, see also, Statista, (2023). Facebook: quarterly number of MAU (monthly active users) worldwide 2008-2022, Published by S. Dixon, Available at: <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>, retrieved from 6.03.2023.

¹⁶ Rennie, E., & Steele, S. (2021). Privacy and emergency payments in a pandemic: How to think about privacy and a central bank digital currency. *Law, Technology and Humans*, 3(1), 6-17. Echarte Fernández, M. Á., Nández Alonso, S. L., Jorge-Vázquez, J., & Reier Forradellas, R. F. (2021). Central banks’ monetary policy in the face of the COVID-19 economic crisis: Monetary stimulus and the emergence of CBDCs. *Sustainability*, 13(8), 4242; Mansour, H. (2022). How successful countries are in promoting digital transactions during COVID-19. *Journal of Economic Studies*, 49(3), 435-452.

for further exploration of the use of CBDCs in the payment system.¹⁷ As a consequence of these events, in 28 June 2023, the European Commission presented its proposal for a Regulation regarding the possible creation of the Digital Euro. This instrument would represent a significant innovation, entailing various and notable consequences with reference to various domains, out of which, of major interest are monetary policy and financial stability. This paper aims to study the topic in question, articulating a multidisciplinary analysis while also bringing into attention relevant elements on a legislative level.

The article proceeds in four sections. Section I offers an introduction to CBDCs. Section II focuses on their definition, drivers and disadvantages, while performing a literature review. Section III analyses CBDC initiatives around the world aiming to explore the regulatory design related to them. This section includes also an analysis on the main points of the legislative proposals recently put forward by the European Commission. In the last section, controversies concerning the above mentioned legislative proposals and other reports on the subject are being analyzed and conclusions are being drawn.

2. Literature review

¹⁷ Srouji, J., & Torre, D. (2022). The Global Pandemic, Laboratory of the Cashless Economy?. *International Journal of Financial Studies*, 10(4), 109.

This section focuses on the critical analysis of the definitions of CBDC, while also focusing on their contextualization in the finance and legal fields. It also highlights the challenges and benefits of issuing a CBDC.

2.1. CBDC Definitions

Policymakers and academics did not agree upon a definition of CBDC. According to IMF, “Central bank digital currencies (CBDCs) are digital versions of cash that are issued and regulated by central banks,”¹⁸ being therefore considered as more secure and implicitly not unstable, as opposed to crypto assets. Also, IMF staff concludes in a report that “CBDC could be the next milestone in the evolution of money,” even if there is “no universal case for CBDC adoption yet.”¹⁹ In a more detailed manner, Tronnier, Recker & Hamm defined CBDCs “as digital and central bank-issued currencies excluding central bank reserves and settlement accounts, as these are already long-established instruments.”²⁰ Because

¹⁸ IMF (Stanley A.) (September 2022). The Ascent of CBDCs. More than half of the world’s central banks are exploring or developing digital currencies *Finance & Development*, p. 48, Available at: <https://www.imf.org/en/Publications/fandd/issues/2022/09/Picture-this-The-ascent-of-CBDCs>, retrieved on 6.10.2023.

¹⁹ Mancini-Griffoli, T., Peria, M. S. M., Agur, I., Ari, A., Kiff, J., Popescu, A., & Rochon, C. (2018). Casting light on central bank digital currency. *IMF staff discussion note*, 8(18), 1-39, p. 30.

²⁰ Tronnier, F., Biker, P., Baur, E., & Löbner, S. (2023, June). An Evaluation of Information Flows in Digital Euro Transactions Using Contextual Integrity Theory. In *Proceedings of the 2023 European Interdisciplinary Cybersecurity Conference* (pp. 7-12).

CBDCs tend to be in various financial development phases, each country establishing different goals according to their particular needs, several definitions of CBDCs were synthesized in table 1 below, from important institutions or organizations.

Author	Year	Definition
IMF (Mancini-Griffoli, T., Peria, M. S. M., Agur, I., Ari, A., Kiff, J., Popescu, A., & Rochon, C.)	2018	“CBDC is a digital form of existing fiat money, issued by the central bank and intended as legal tender.” ²¹
IMF (Stanley A.)	2022	“Central bank digital currencies (CBDCs) are digital versions of cash that are issued and regulated by central banks.” ²²
BIS	2018	“it is envisioned by most to be a new form of central bank money. That is, a central bank liability, denominated in an existing unit of account, which serves both as a medium of exchange and a store of value.” ²³

²¹ Mancini-Griffoli et al. (2018), p. 30.

²² IMF (Stanley A.) (September 2022). The Ascent of CBDCs. More than half of the world’s central banks are exploring or developing digital currencies *Finance & Development*. Retrieved from: <https://www.imf.org/en/Publications/fandd/issues/2022/09/Picture-this-The-ascent-of-CBDCs>, accessed on 13.10.2023.

²³ BIS. (2018). Central bank digital currencies. *Committee on Payments and Market Infrastructures Markets Committee*, No. 174, p. 3, Retrieved from: <https://www.bis.org/cpmi/publ/d174.pdf>, accessed on 13.10.2023.

BIS	2020	“A CBDC is a digital payment instrument, denominated in the national unit of account, that is a direct liability of the central bank.” ²⁴
EDPS -European Data Protection Supervisor (Leucci, St.)	2022	“Central Bank Digital Currency (CBDC) is a new form of money that exists only in digital form. Instead of printing money, the central bank issues widely accessible digital coins so that digital transactions and transfers become simple.” ²⁵
EU (Höflmayr, M.)	2023	“CBDCs are digital representations of sovereign currencies, public money that is issued by a jurisdiction’s monetary authority and is reflected on its balance sheet.” ²⁶
Bank of England	2023	“Central bank digital currency (CBDC) is money that a country’s central bank can issue. It’s called digital (or electronic) because it isn’t physical money like notes and coins. It is in

²⁴ BIS (2020). Central bank digital currencies: foundational principles and core features, p. 3. Retrieved from: <https://www.bis.org/publ/othp33.pdf>, accessed on 13.10.2023.

²⁵ The European Data Protection Supervisor (EDPS) (Leucci, S., editor). (2022). TechSonar Report 2022-2023. European Union, November 2022, p. 18. Retrieved from: https://edps.europa.eu/system/files/2022-11/22-11-10_techsonar_report_22_23_en.pdf, accessed on 13.10.2023.

²⁶ European Commission, (2023). BRIEFING EU Legislation in Progress. Digital euro package. Directorate-General for Financial Stability, Financial Services and Capital Markets Union, p. 2. Retrieved from: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI\(2023\)751477_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI(2023)751477_EN.pdf), accessed on 16.10.2023.

		the form of an amount on a computer or similar device.” ²⁷
--	--	---

Table 1. Definition of CBDC

Source: made by the authors

For the current research, the following definition will be used: “CBDCs are digital representations of sovereign currencies, public money that is issued by a jurisdiction’s monetary authority and is reflected on its balance sheet. Retail CBDCs, such as the digital euro, are intended for general-purpose use and broad availability for citizens as a digital equivalent to cash, as opposed to wholesale CBDCs, which are limited to a set of pre-defined user groups, for instance financial institutions, to settle large value transactions.”²⁸ There are two major types of CBDCs: Retail (digital euro) and wholesale CBDCs. The first type is “intended for general-purpose use and broad availability for citizens as a digital equivalent to cash”, meanwhile the second one is “limited to a set of pre-defined user groups, for instance financial institutions, to settle large value transactions.”²⁹ There is still a major debate nowadays on how their introduction could

²⁷ Bank of England. (2023). What is CBDC? Retrieved from: <https://www.bankofengland.co.uk/explainers/what-is-a-central-bank-digital-currency>, accessed on 13.10.2023.

²⁸ European Commission, (2023). BRIEFING EU Legislation in Progress. Digital euro package. Directorate-General for Financial Stability, Financial Services and Capital Markets Union, Martin Höflmayr (author), Retrieved from: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI\(2023\)751477_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI(2023)751477_EN.pdf), accessed on 13.10.2023.

²⁹ Idem, p. 2.

entirely change the banking sector, with monetary stability as a central concern.

2.2. CBDCs pros and cons

The advantages and challenges behind the CBDCs initiatives will be analyzed in this section, as they have been pointed out by several experts from BIS, ECB, IMF, Board of Governors of the Federal Reserve, Bank of Canada and other prestigious institutions in the field, but also by academic scholars and practitioners. The academic literature stipulates as drivers of issuing a CBDC: usage convenience³⁰; financial inclusion³¹;

³⁰ Bindseil, U., Panetta, F., & Terol, I. (2021). Central Bank Digital Currency: functional scope, pricing and controls. *ECB Occasional Paper*, (2021/286); Garratt, R., Yu, J., & Zhu, H. (2022). how CBDC design choices impact monetary policy pass-through. Kahn, C. M., & Rivadeneyra, F. (2020). *Security and convenience of a central bank digital currency* (No. 2020-21). Bank of Canada. Kiff, M. J., Alwazir, J., Davidovic, S., Farias, A., Khan, M. A., Khiaonarong, M. T., ... & Zhou, P. (2020). A survey of research on retail central bank digital currency; Infante, S., Kim, K., Silva, A. F., & Tetlow, R. J. (2022). The macroeconomic implications of CBDC: A review of the literature.

³¹ Tan, B. (2022). Central bank digital currency and financial inclusion. *Available at SSRN 4307377*; Armas, A., Ruiz, L., & Vásquez, J. L. (2022). Assessing CBDC potential for developing payment systems and promoting financial inclusion in Peru. *BIS Papers chapters*, 123, 131-151; Allen, F., Gu, X., & Jagtiani, J. (2022). Fintech, cryptocurrencies, and CBDC: Financial structural transformation in China. *Journal of International Money and Finance*, 124, 102625; Dakila Jr, F. G. (2022). Deliberations of an emerging market economy central bank on central bank digital currencies. *BIS Papers chapters*, 123, 153-160.

faster, cheaper and more efficient payment systems³²; competence, and perceived security or safety.³³

Efficiency. CBDCs provide high transaction efficiency at low costs for payment systems. In the traditional financial system, especially in international transactions (swift, western union, etc.), costs are high and the time required for transactions is long. With the spread of crypto currencies and stablecoins, low-cost and fast alternatives have emerged in money transfers. However, these currencies are not legally regulated and have security issues. In turn, CBDCs can increase efficiency by reducing the costs of both national and international payment systems, the security being under the governance of central banks. CBDCs can spread low costs and high transaction efficiency throughout the financial system, with 24/7 and instant transactions. Therefore, the efficiency of CBDCs is expected to be high.

Security. CBDCs will positively impact the security of the financial system. With CBDCs, financial transactions will become traceable by central banks. This traceability allows money laundering, terrorist financing, tax evasion or informal economy activities, generally speaking, to be tracked quickly and easily. CBDCs can, at the same time, prevent unregistered economic activities. In a design where CBDCs replace cash, unregistered

³² Carstens, A. (2020). Shaping the future of payments. *BIS Quarterly Review*, March; Chorzempa, M. (2021). China, the United States, and central bank digital currencies: how important is it to be first?. *China Economic Journal*, 14(1), 102-115.

³³ Soderberg, G., Bechara, M. M., Bossu, W., Che, M. N. X., Davidovic, S., Kiff, M. J., ... & Yoshinaga, A. (2022). Behind the scenes of central bank digital currency: Emerging trends, insights, and policy lessons.

cash transactions become impossible and an automatic preventive mechanism is provided.

Several further arguments in support of issuing and adopting CBDCs should also be mentioned. First, security and safety of payment systems will also increase customer protection. Second, CBDCs will boost mobile money adoption, providing access to users to an ample spectrum of digital financial services and products. Third, according to Obiora (2023), “a central bank digital currency will enable central banks to reduce interest rate as far as needed in the event of a deflationary spiral, thereby allowing central banks to use negative interest rates when it is needed.”³⁴ Fourth, since CBDC is produced digitally in a virtual environment, the cost of production tends to zero. The cost of new money production consists of the expenses incurred to change numbers in the digital environment and ensure the security of the digital environment. In this system, there are no expenses such as workplace rent or paper costs where money is produced and stored, and other expenses are minimized. Therefore, in the digital currency system, the production cost of money is much less than in the paper money system, and the seigniorage income of the state increases significantly. Therefore, “through CBDC the central bank may increase its seigniorage revenue, which, everything else equal, would allow the government to reduce income taxes.”³⁵ This could also backfire, since

³⁴ Obiora, K. I. (2023). Chapter one: a primer into the benefits, risks, lessons, and prospects of Africa’s first central bank digital currency, the ENAIRA. *of digital currencies*, 3, p. 5.

³⁵ Bacchetta, P., & Perazzi, E. (2022). CBDC as imperfect substitute for bank deposits: a macroeconomic perspective. *Swiss Finance Institute Research Paper*, (21-81), p. 3.

increasing the transaction speed of money in the digital money system may increase the circulation rate, and increasing the circulation speed may increase the risk of inflation. In this context, there are debates concerning some of these drivers since they can also trigger negative aspects as the one mentioned above, or, for example, the exclusion of people who do not have access to technologies or lack digital skills. Elderly people, children and those resistant to innovation may have difficulties in adapting to the CBDC system.

Further on, the focus will be on the major drawbacks and disadvantages of CBDCs. Generally, researchers classify them as either financial or non-financial. The key financial uncertainties concerning CBDCs are given by: credit centralization/contraction and disintermediation of banks³⁶; inflate the balance sheets of central banks, although this subject is highly debated³⁷; volatility³⁸, and, in general, risks posed to monetary and financial stability³⁹.

³⁶ Bindseil, U. (2019). Central bank digital currency: Financial system implications and control. *International Journal of Political Economy*, 48(4), 303-335; Nabilou, H. (2020). Testing the waters of the Rubicon: the European Central Bank and central bank digital currencies. *Journal of Banking Regulation*, 21, 299-314; Chen, S., Goel, T., Qiu, H., & Shim, I. (2022). CBDCs in emerging market economies. *BIS Papers*.

³⁷ Bindseil, U. (2020). Tiered CBDC and the financial system. *Available at SSRN 3513422*; Malloy, M., Martinez, F., Styczynski, M. F., & Thorp, A. (2022). Retail CBDC and US monetary policy implementation: A stylized balance sheet analysis.

³⁸ Wang, Y., Lucey, B. M., Vigne, S. A., & Yarovaya, L. (2022). The effects of central bank digital currencies news on financial markets. *Technological Forecasting and Social Change*, 180, 121715; Yang, J., & Zhou, G. (2022). A study on the influence mechanism of CBDC on monetary policy: An analysis based on e-CNY. *Plos one*, 17(7), e0268471; Armelius, H., Guibourg, G., Johansson, S., & Schmalholz, J. (2020). E-krona design models: pros, cons and trade-offs. *Sveriges Riksbank Economic Review*, 2, 80-96.

³⁹ Kim, Y. S., & Kwon, O. (2019). Central bank digital currency and financial stability. *Bank of Korea WP*, 6; Kumhof, M., & Noone, C. (2021). Central bank digital

The CBDC system may imply some non-financial disadvantages such as cyber-attacks, speculative-attacks, lack of trust on behalf of citizens, difficulties in adapting to the system, but also aspects regarding the increase of the power of central banks, which could be a major problem particularly in highly controlled states where citizens' privacy could be negatively impacted. In some of the above-mentioned cases, there is a need to prevent digital currencies from being used for money laundering and terrorist financing. In addition, the CBDC system cannot function properly in countries where central banking, commercial banking and regulatory and supervisory institutions are not sufficiently developed and their roles are not well defined. In such cases, the system can become a safe haven for money laundering and frauds. For the CBDC system to function properly, countries' transmission networks must be strong enough and their coverage areas must be as wide as possible. Developed countries that have the necessary human and financial capital accumulation may be luckier in this regard. Developing and underdeveloped countries can only access these opportunities with the determination of their governments and sufficient external support. Otherwise, the gap between these countries may deepen further. As far as transition risks are concerned, such as design issues or various risks, any

currencies—Design principles for financial stability. *Economic Analysis and Policy*, 71, 553-572; Allen, F., Gu, X., & Jagtiani, J. (2022). Fintech, cryptocurrencies, and CBDC: Financial structural transformation in China. *Journal of International Money and Finance*, 124, 102625.

innovation generally leads to criticism so perhaps greater caution and detailed planning and supervision are necessary.

3. CBDCs initiatives around the world

Central banks were skeptical⁴⁰ and had various concerns⁴¹ at first with regards to digital currencies, but the announcement of Libra (later changed into Diem, and discarded in 2022) turned into a game changer for them, while also challenging the international financial system⁴². The first countries to develop CBDC proposals, which are currently in an advanced phase of development, were China (DCEP) and Sweden (e-krona). Up to date, over 130 countries⁴³ are studying the introduction of CBDC, out of which only three have already launched it (see table 2):

⁴⁰ Soderberg, G., Bechara, M. M., Bossu, W., Che, M. N. X., Davidovic, S., Kiff, M. J., ... & Yoshinaga, A. (2022). Behind the scenes of central bank digital currency: Emerging trends, insights, and policy lessons; Bindseil, U. (2022). Central Bank Digital Currencies in a World with Negative Nominal Interest Rates. In *The Future of Financial Systems in the Digital Age: Perspectives from Europe and Japan* (pp. 75-88). Singapore: Springer Singapore; Bindseil, U. (2020). Op. Cit.; Nabilou, H. (2020). Testing the waters of the Rubicon: the European Central Bank and central bank digital currencies. *Journal of Banking Regulation*, 21, 299-314.

⁴¹ Taskinsoy, J. (2021). Say Good Bye to Physical Cash and Welcome to Central Bank Digital Currency. *Available at SSRN 3972858*.

⁴² Wang, H., & Gao, S. (2023). The future of the international financial system: The emerging CBDC network and its impact on regulation. *Regulation & Governance*.



⁴³ The “Atlantic Council” Think Tank keeps track of the progress on this topic of the main countries of the globe, indicating the nations that have reached an advanced level and those that, however, are still in a study phase. See, in this regard, the website of Atlantic Council Organization, retrieved from: <https://www.atlanticcouncil.org/cbdctracker/>, accessed on 24.10.2023.

Table 2. Launched CBDCs

Digital currency	Country / Region	Central Bank(s)	Announcement Year	Status
e-Naira	Nigeria	Central Bank of Nigeria	2021	Launched
Sand Dollar	Bahamas	Central Bank of Bahamas	2017	Launched
JAM-DEX	Jamaica	Bank of Jamaica	2023	Launched

Source: CBDC Tracker (cbdctracker.org).

As it can be seen in the table above, successful launches include the Bahamian Sand dollar (2017) which stands as “the first real-world instance of a retail CBDC”⁴⁴, the Nigerian currency e-Naira (2021), and more recently, the Jamaican JAM-DEX (2023). There are also countries where

IMF. (2023). IMF Approach to Central Bank Digital Currency Capacity Development. Policy Paper No. 2023/016. International Monetary Fund, Washington, D.C., p. 2. Retrieved from: <https://www.imf.org/en/Publications/Policy-Papers/Issues/2023/04/12/IMF-Approach-to-Central-Bank-Digital-Currency-Capacity-Development-532177>, accessed on 15.10.2023; Stanley, A. N. D. R. E. W. (2022). The ascent of CBDCs. *The Money Revolution*   : *Crypto, CBDCs, and the future of finance*, 48.

⁴⁴ For more information see: Wenker, K. (2022). Retail central bank digital currencies (CBDC), Disintermediation and financial privacy: The case of the Bahamian sand dollar. *FinTech*, 1(4), 345-361.

CBDCs are in an advanced phase, more precisely in a pilot state (see table 3), among them being also China and Russia:

Table 3. Central Bank Digital Currencies in the Pilot Status

Digital currency	Country / Region	Central Bank(s)	Announcement Year	Status
e-CNY	China	People's Bank of China	2014	Pilot
e-Peso	Uruguay	Central Bank of Uruguay	2014	Pilot
DCash	Eastern Caribbean Economic and Currency Union (OECS/ECCU)	Eastern Caribbean Central Bank (ECCB)	2017	Pilot
E-cedi	Ghana	The Bank of Ghana	2018	Pilot
Digital Ruble	Russian Federation	Bank of Russia	2019	Pilot
Aber	United Arab Emirates	United Arab Emirates Central Bank	2019	Pilot

Aber	Saudi Arabia	Saudi Arabian Monetary Authority	2019	Pilot
Digital Rupee	India	RBI	2020	Pilot
Digital Won	South Korea	Bank of Korea	2020	Pilot
France wholesale CBDC	France	Banque de France	2021	Pilot
Project Prosperus	Tunisia	Central Bank of Tunisia	2021	Pilot
Project Prosperus	France	Banque de France	2021	Pilot
Project Ubin+	Singapore	Monetary Authority of Singapore	2022	Pilot
Switzerland Wholesale CBDC	Switzerland	Swiss National Bank	2023	Pilot

Source: CBDC Tracker (cbdctracker.org).

These CBDCs proposals emerge in a moment when private money like cryptocurrencies keep trending both in trading volume and in capacity of

coins, increasing competition and forcing central banks into reforming. As seen so far, there is an urge for the development of CBDCs, the main motivations, drivers and challenges being already exposed so far. A brief analysis of several major CBDCs will be made further on.

3.1. eNaira

The Central Bank of Nigeria (CBN) Digital Currency was officially introduced on October 25, 2021, being a complex monetary project⁴⁵ implemented by the CNB together with global financial institutions, in particular the Monetary and Capital Markets Department of the International Monetary Fund (IMF), which was involved in the development of the eNaira design⁴⁶. In addition, the IMF also discussed risk monitoring while cooperating with the CBN on introducing eNaira into circulation, shared this experience with other states, in the same time considering further evolution of CBDC, from its design to its regulatory architecture.

In other words, the project looked like a monetary experiment aimed at identifying the financial and economic effects of the introduction of the Central Bank. In monetary history, this was the second case - after the

⁴⁵ Ozili, P. K. (2023b). eNaira central bank digital currency (CBDC) for financial inclusion in Nigeria. In *Digital Economy, Energy and Sustainability: Opportunities and Challenges* (pp. 41-54). Cham: Springer International Publishing.

⁴⁶ Ree, J. (2021). Five observations on Nigeria's central bank digital currency. *IMF Country Focus*, (16), 11.

Bahamas CBDC. eNaira is a digital form of the national currency stored in digital wallets and can be used for payment transactions, its circulation being free. The main opportunities⁴⁷ pursued by the developers from the Central Bank of Nigeria were⁴⁸: increasing financial inclusion; facilitation of remittances; simplification of money transfers and greater transparency - particularly in the shadow sector of the economy.

In order to encourage citizens to use digital currency, in January 2023, the decision of the Central Bank of Nigeria to limit cash withdrawals came into force⁴⁹. The main goal of the Nigerian government was the gradual withdrawal of cash from circulation⁵⁰. Still, this policy experiment - to introduce CBDC while abandoning cash money, in the case of Nigeria shows, according to Bludnik “that the negative aspects prevail over these undoubted benefits, one in particular, namely the lack of trust and public acceptance of the monetary revolution taking place.”⁵¹ Indeed, along the way of eNaira adoption, several challenges were encountered that need to be pointed out: (1) a significant part of the population did not have a bank account, the introduction of eNaira being expected to gradually extend

⁴⁷ Chukwuere, J. E. (2021). The eNaira-Opportunities and challenges. *Journal of Emerging Technologies*, 1(1), 72-77.

⁴⁸ Ree, J. (2023). *Nigeria's eNaira, One Year After* (No. 2023/104). International Monetary Fund, p. 4.

⁴⁹ Otitoju, M. A., Dirisu, I. H., Ojokojo, P. P., & Abdul, F. (2023). Cashless policy and Naira redesign of the Central Bank of Nigeria (CBN): a review. *Journal of Global Economics and Business*, 4(14), 45-59.

⁵⁰ Fabian, O., Emeka, O., & Okeke Chinenye, J. (2022). E-naira digital currency and financial performance of listed deposit money banks in Nigeria. *International Journal of Trend in Scientific Research and Development*, 6(2), 222-229.

⁵¹ Bludnik, I. (2023). Central Bank Digital Currency and the Cashless Economy: The African Experience. *European Research Studies Journal*, 26(3), p. 323.

coverage to all those having a mobile phone (2) the implementation of the Nigerian digital currency did not take into account the socio-institutional risks of project implementation - lack of trust in the government, the central bank and the national currency as a result of high inflation and devaluation of the national currency⁵², naira; (3) ineffective performance of e-Naira can be linked to cryptocurrency ban in Nigeria. The continuous devaluation of the naira⁵³ led to the fact that most Nigerians turned to cryptocurrencies⁵⁴, even despite the ban of the central bank on transactions with cryptocurrencies⁵⁵.

When assessing eNaira adoption, Wezel & Ree (2023) mention that “the adoption of eNaira by households and merchants has been rather slow. After a strong initial uptake, wallet downloads have slowed, reaching 0.8 percent of bank accounts, and merchant wallet downloads amount to about 10 percent of merchants with point-of-sale terminals. Similarly, wallet activity is low, with most wallets appearing inactive. The average number of weekly eNaira transactions since the launch amounts to only 8 percent of wallets, with an average transaction value of N53,000 (about

⁵² Ozili, P. K. (2023c). Using eNaira CBDC to solve economic problems in Nigeria. *Revolutionizing Financial Services and Markets Through FinTech and Blockchain*, Forthcoming.

⁵³ Ahiabenu, K. (2022). A comparative study of the design frameworks of the Ghanaian and Nigerian central banks’ digital currencies (CBDC). *FinTech*, 1(3), 235-249.

⁵⁴ Greenfield, R. (2023). The State of Cryptocurrency Regulation: Nigeria. *Available at SSRN 4531980*.

⁵⁵ In February 2021, the Nigerian Central Bank issued a Directive according to which it prohibited local banks from serving bitcoin exchanges and companies working with digital assets. Chukwuere, J. E. (2021). The eNaira-Opportunities and challenges. *Journal of Emerging Technologies*, 1(1), 72-77.

US\$120).”⁵⁶ These being said, it is necessary for CBN, FinTechs, and financial sectors to find solutions and tackle the challenges seen above. In spite of these challenges, eNaira has had undeniable successes, leading to financial inclusion in Nigeria, yet many challenges remain.

3.2. e-CNY

The Chinese government, through the People’s Bank of China (PBOC) has canalized its efforts since 2014⁵⁷ towards the release of a retail digital currency known under the name of a Digital Currency Electronic Payment (DCEP)⁵⁸, the program being launched in 2020. Currently, this digital currency is in the most advanced stage of development, globally speaking.⁵⁹ An official announcement was made in 2020 by PBOC’s Digital Currency Research Institute, stating that closed pilot tests of digital currency would be conducted “in Shenzhen, Suzhou, Xiong’an New Area,

⁵⁶ Wezel, T., & Ree, M. J. J. (2023). *Nigeria--Fostering Financial Inclusion through Digital Financial Services*. International Monetary Fund, p. 18.

⁵⁷ In 2014, a research group was established by the PBOC focusing on the issuance of the digital yuan, complementary key technologies, design, issuance and circulation of the digital currency. Later on, in 2016 was launched the CBDC Research Institute and one year later joint research trials with commercial institutions. For further information see PBOC. (2021). Working Group on E-CNY Research and Development of the PBOC. Beijing, China: Progress of Research and Development of E-CNY in China.

⁵⁸ Also known as China e-CNY or digital Yuan

⁵⁹ For more information see Fanusie, Y., J., & Jin, E., (2021). China’s Digital Currency. Adding Financial Data to Digital Authoritarianism. *Energy, Economics & Security*. Center for a New American Security. Washington D.C., p. 11; Kshetri, N. (2023). China’s digital yuan: Motivations of the Chinese government and potential global effects. *Journal of Contemporary China*, 32(139), 87-105. <https://doi.org/10.1080/10670564.2022.2052441>.

Chengdu and the Winter Olympics scenarios.”⁶⁰ One year later, such pilot activities were implemented “in Beijing, Shenzhen, Shanghai, Chengdu and other places”⁶¹, this development marking major steps for the above-mentioned pilot activities. Last year, “the digital RMB (pilot version) application was officially launched on the Apple App Store and Android app stores and made available for download”⁶², in the same areas. More recently, the e-CNY became accessible to foreign customers as well, apart from Chinese users, during the 2022 Winter Olympics.⁶³ Although the world’s second economy, China might be targeting promoting e-CNY in order to become “of global significance”⁶⁴. According to Bilotta, e-CNY has strategic importance in China’s efforts to internationalize the Yuan⁶⁵. These activities have raised serious concerns, particularly in the USA and in Bruxelles⁶⁶, as the circulation of the e-CNY can thus be increased which could lead to a global reach, endangering the US Dollar supremacy in the digital world⁶⁷, conferring an unmistakable geopolitical advantage and

⁶⁰ Xu, C., & Jin, B. (2022). Digital currency in China: pilot implementations, legal challenges and prospects. *Juridical Trib.*, 12, p. 179.

⁶¹ Idem.

⁶² Idem.

⁶³ Huang, R. H., & Li, S. X. (2023). China’s Pursuit of Central Bank Digital Currency: Reasons, Prospects and Implications. *Banking & Finance Law Review*, 39(3), 409-443.

⁶⁴ van der Linden, R. W., & Łasak, P. (2023). The Digitalization of Cross-Border Payment Systems and the Introduction of the CBDC. In *Financial Interdependence, Digitalization and Technological Rivalries: Perspectives on Future Cooperation and Integration in Sino-American Financial Systems* (pp. 75-92). Cham: Springer Nature Switzerland, p. 75.

⁶⁵ Bilotta, N. (2021). An international digital Yuan:(Vane) ambitions, (excessive) alarmism and (pragmatic) expectations. *LAI Commentaries*, (21), 44.

⁶⁶ Laband, J. (2022). Existential Threat or Digital Yawn: Evaluating China’s Central Bank Digital Currency. *Harv. Int’l LJ*, 63, 515.

⁶⁷ Kuehnlenz, S., Orsi, B., & Kaltenbrunner, A. (2023). Central bank digital currencies and the international payment system: The demise of the US dollar?. *Research in*

power⁶⁸, one reason behind this being “China’s claim to global status.”⁶⁹ Another concern regards the fact that this will strengthen the digital authoritarianism⁷⁰ of the Chinese Communist Party (CCP), providing it “with a new powerful tool to monitor and control its economy and people.”⁷¹ The last published working paper of PBOC, in July 2021, confirms that PBOC explores the potential of e-CNY with regards to “(1) retail model with a two-tier system; (2) domestic and cross-border types; (3) a combination of DLT technology and centralized management; and (4) cash-like controllable anonymity.”⁷²

There are several positive features of the e-CNY, some of which will be mentioned further on. The Central Bank of China’s CBDC project e-CNY uses “Near Field Communication” (NFC) technology⁷³. NFC technology enables close-range communication between devices, allowing payment

International Business and Finance, 64, 101834.
<https://doi.org/10.1016/j.ribaf.2022.101834>.

⁶⁸ Han, A. S. (2021). Chinese fintech companies and their “going out” strategies. *Journal of Internet and Digital Economics*, 1(1), 47-63.

⁶⁹ For more information see: Huber, J. (2023). *The Monetary Turning Point: From Bank Money to Central Bank Digital Currency (CBDC)*. Springer Nature, p. 91. Samek, M., & Vlasta, M. (2021). Digital Yuan—Currency or Policy Tool?. *AUC IURIDICA*, 67(3), 111-127.

⁷⁰ For more information see: Liu, A. (2019). An Analysis of the PBOC’s New Mobile Payment Regulation. *Cato J.*, 39, 87. Polyakova, A., & Meserole, C. (2019). Exporting digital authoritarianism: The Russian and Chinese models. *Policy Brief, Democracy and Disorder Series*, 1-22. Laband, J. (2022). Existential Threat or Digital Yawn: Evaluating China’s Central Bank Digital Currency. *Harv. Int’l LJ*, 63, 515.

⁷¹ Kshetri, N. (2023). China’s digital yuan: Motivations of the Chinese government and potential global effects. *Journal of Contemporary China*, 32(139), p. 87.
<https://doi.org/10.1080/10670564.2022.2052441>.

⁷² Cheng, P. (2023). Decoding the rise of Central Bank Digital Currency in China: designs, problems, and prospects. *Journal of Banking Regulation*, 24(2), p. 161.

⁷³ Li, S., & Huang, Y. (2021). The genesis, design and implications of China’s central bank digital currency. *China Economic Journal*, 14(1), p. 72.

transactions to be made without requiring an internet connection. In countries where mobile internet use is not widespread among all segments of the population, a CBDC design that can only be accessed via the internet cannot appeal to the general population. Therefore, the use of NFC technology can increase the financial inclusion ability of CBDCs, especially in developing countries with relatively low internet penetration rates. At the same time, the way in which PBOC dealt with anonymity is another key positive aspect for the e-CNY. If full anonymity is achieved, central banks will not have the opportunity to monitor, detect or prevent illegal transactions. However, for e-CNY this problem is solved by defining five different wallet types with different degrees of anonymity. In order to prevent illegal transactions, transaction limits decrease as the anonymity level of wallets increases. For high balance transfers, non-anonymous wallets with no transaction limits will need to be used⁷⁴. In this context, while e-CNY provides anonymity for micropayments as in cash⁷⁵, it prevents illegal uses thanks to transaction limits and the inverse proportionality of anonymity. As a result, CBDCs, with different designs, can provide different degrees of data privacy and security⁷⁶.

⁷⁴ Li & Huang, 2021, p.70.

⁷⁵ Pocher, N., & Zichichi, M. (2022, April). Towards CBDC-based machine-to-machine payments in consumer IoT. In *Proceedings of the 37th ACM/SIGAPP Symposium on Applied Computing* (pp. 308-315).

⁷⁶ Li, Z., Zhang, Y., Wang, Q., & Chen, S. (2022). Transactional Network Analysis and Money Laundering Behavior Identification of Central Bank Digital Currency of China. *Journal of Social Computing*, 3(3), 219-230.

3.3. E-Pound

In the United Kingdom, the Bank of England and the Treasury announced the creation of a working group in 2021 with the aim of exploring CBDCs. At the same time, there have been various institutions that have taken an interest in the topic in question, studying the possible creation of a Digital Pound such as: the Bank of England, the Government and the Parliament of London. In this regard, particularly interesting for the purposes of this analysis is a report drawn up by the House of Lords: document which, although on the one hand underlined positive impacts deriving from a CBDC, on the other hand claimed that, to date, there are no sufficient motivations in order to create a CBDC, defining this tool as “a solution in search of a problem.”⁷⁷

In February 2023, the BoE and Treasury published a consultation paper on “The digital pound: a new form of money for households and businesses?”⁷⁸ together with a “Technology Working Paper”⁷⁹, both of

⁷⁷ See the report published by House of Lords Economic Affairs Committee. (2022). *Central bank digital currencies: a solution in search of a problem?* 3rd Report of Session 2021–22, retrieved from: <https://publications.parliament.uk/pa/ld5802/ldselect/ldeconaf/131/131.pdf>, accessed on 24.10.2023.

⁷⁸ Bank of England and HM Treasury. (2023). *The digital pound: A new form of money for households and businesses?* Consultation Paper, February 2023. Retrieved from: <https://www.bankofengland.co.uk/paper/2023/the-digital-pound-consultation-paper>, accessed on 20.10.2023.

⁷⁹ Bank of England. (2023). *The digital pound: Technology Working Paper*. Technical report, February 2023. Retrieved from: <https://www.bankofengland.co.uk/paper/2023/the-digital-pound-technology-working-paper>, accessed on 20.10.2023.

them being closed for responses on 30 June 2023. According to the BoE⁸⁰, the focus will further be “on the design phase over the next 2-3 years, which will look at the technology and policy requirements for a digital pound. If the results of this phase conclude that the case for the digital pound is made, we will move into a build phase. The earliest date we would issue the digital pound would be the second half of the decade.”⁸¹

3.4. E-Dollar

3.4.1. General Perspective

The trend towards creating a national digital currency is also being studied in the United States, although it has remained at a stage that can be considered preliminary. Although some of the 12 Regional Federal Reserve Banks have launched CBDC study projects involving both research centers, international organizations and foreign entities, the FED continues to avoid stating whether it intends, or not, to issue a Digital Currency. Thus, even if, to date, the Federal Reserve has not made any effective decision to issue a CBDC for the US payment system, the agency’s position is that, given the relevance of the dollar in the global economy, it is of paramount importance that the country continues to invest in research and development of policies related to the digitalization

⁸⁰ Bank of England. (2023). The digital pound. Retrieved from: <https://www.bankofengland.co.uk/the-digital-pound>, accessed on 20.10.2023.

⁸¹ Idem.

of money. Recently, in early 2022 the Federal Reserve published a report on CBDCs: “Money and Payments: The U.S. Dollar in the Age of Digital Transformation”⁸². The Federal Reserve even underlined the role of a CBDC dollar: “Another potential benefit of a U.S.-issued CBDC could be to preserve the dominant international role of the U.S. dollar. The dollar is the world’s most widely used currency for payments and investments; it also serves as the world’s reserve currency. The dollar’s international role benefits the United States by, among other things, lowering transaction and borrowing costs for U.S. households, businesses, and government. The dollar’s international role also allows the United States to influence standards for the global monetary system. Today, the dollar is widely used across the globe because of the depth and liquidity of U.S. financial markets, the size and openness of the U.S. economy, and international trust in U.S. institutions and rule of law.”⁸³ In this context, the Federal reserve underlined the importance of considering the significance of a possible “future state in which many foreign countries and currency unions may have introduced CBDCs. Some have suggested that, if these new CBDCs were more attractive than existing forms of the U.S. dollar, global use of the dollar could decrease—and a U.S. CBDC might help preserve the international role of the dollar.”⁸⁴

⁸² The Federal Reserve. (2022). Money and Payments: The U.S. Dollar in the Age of Digital Transformation. Retrieved from: <https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf>, accessed on 20.10.2023.

⁸³ Idem, p. 15.

⁸⁴ Idem.

In this sense, the Federal Reserve highlighted that it is committed to improving knowledge about blockchain technology and its potential application in the public sphere in relation to a digital currency. To this end, the American government has supported the projects of the Federal Reserve Bank of Boston⁸⁵ as well as collaborating in international projects on CBDC, and in this respect can be mentioned the Bank for International Settlements.⁸⁶

Former United States Federal Reserve vice-chair for supervision Randal Quarles stated that the main distinction of CBDC in relation to existing electronic money is that a federal digital currency would be available directly between the individual and the central bank. In this sense, there are several possible ways to be adopted by the United States, such as an account-based model, offered directly to the general public or another model in which the Reserve would send/receive the digital currency to the financial institution, adopting a form more similar to electronic money. This way, the money would be claimable against the Federal Reserve, but could potentially be transferred between users in the same way as physical cash, or through the use of an intermediary.

The presidential administration, signed an executive order on March 9, 2022⁸⁷ requiring regulatory agencies to evaluate the risks and benefits of

⁸⁵ *Idem*, p. 23.

⁸⁶ *Idem*, p. 32.

⁸⁷ The Federal Reserve. (2022a). President Biden to Sign Executive Order on Ensuring Responsible Development of Digital Assets, retrieved from: <https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/09/fact-sheet-president-biden-to-sign-executive-order-on-ensuring-responsible-innovation-in-digital-assets/>, accessed on 20.10.2023.

creating a digital dollar. In September 2022, the White House released a “White House Releases First-Ever Comprehensive Framework for Responsible Development of Digital Assets” which encourages “the Federal Reserve to continue its ongoing CBDC research, experimentation, and evaluation and call for the creation of a Treasury-led interagency working group to support the Federal Reserve’s efforts.”⁸⁸

The discussion about a digital currency also involves other issues when it comes to the dollar, given the hegemony of the currency on the global stage⁸⁹. Precisely for this reason, some experts argue that the creation of a CBDC is necessary to defend this international position. From this perspective, former United States Federal Reserve vice-chair for supervision Randal Quarles states that it is inevitable that, as the world continues to follow the constantly evolving digitalization trend, and other relevant foreign currencies are converted into fiat cryptocurrencies, some will stand out over others. Still, he argues that “It seems unlikely, however, that the dollar’s status as a global reserve currency, or the dollar’s role as the dominant currency in international financial transactions, will be threatened by a foreign CBDC.”⁹⁰ He supports his ideas with several

⁸⁸ The White House. (2022). FACT SHEET: White House Releases First-Ever Comprehensive Framework for Responsible Development of Digital Assets. Retrieved from: <https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/16/fact-sheet-white-house-releases-first-ever-comprehensive-framework-for-responsible-development-of-digital-assets/>, accessed on 20.10.2023.

⁸⁹ Crawford, J. (2023). The Dollar Dilemma: Hegemony, Control, and the Dollar’s International Role. *Virginia Law & Business Review*, *Forthcoming*.

⁹⁰ Quarles R., (2021). *Speech. Parachute Pants and Central Bank Money*. At the 113th Annual Utah Bankers Association Convention, Sun Valley, Idaho June 28, 2021, retrieved from:

arguments. According to him, this is because the global dominance of the dollar is supported by several aspects of the American currency, such as its monetary strength and the stability of the national economy, as well as the broad commercial links between the USA and its many trading partners spread across the globe. Furthermore, the stable value of the dollar, which has endured for a long time, the ease of converting the dollar into numerous foreign currencies, and strengthened democratic institutions in conjunction with the strong conviction of American property rights help reinforce the international strength of the dollar. These attributes would hardly be threatened if only a foreign currency was converted into a CBDC.

If one considers a global perspective of the evolution of CBDCs up to now, it can be clearly stated that the U.S. dollar is not going to be the first launched CBDC, and not even the third one. This raises some concerns regarding the supremacy of the dollar⁹¹, from the perspective of power relations around the globe, in spite of the opinions expressed by former United States Federal Reserve vice-chair for supervision Randal Quarles mentioned above and even that of Governor Christopher J. Waller who stated that: “I am highly skeptical of whether there is a compelling need for the Fed to create a digital currency.”⁹² This is an opinion that is partially

<https://www.federalreserve.gov/newsevents/speech/quarles20210628a.htm>, accessed on 20.10.2023.

⁹¹ Aysan, A. F., & Kayani, F. N. (2022). China’s transition to a digital currency does it threaten dollarization?. *Asia and the Global Economy*, 2(1), 100023.

⁹² Waller, C. J. (2022). *The US Dollar and Central Bank Digital Currencies: At” Digital Currencies and National Security Tradeoffs,” a symposium presented by the Harvard National Security Journal, Cambridge, Massachusetts October 14th 2022* (No. 95814), Retrieved from:

supported by authorities involved with CBDCs in the UK, as we already saw.

3.4.2. Legal Comments

The reasons why the Fed is delaying the introduction of digital currency are divided into political ones and economic ones. The division is logical because the Fed, as a central banking system, makes decisions based on economic indicators. However, its scope is defined politically, especially by the Federal Reserve Act signed into law on December 23, 1913. The Chairman of the Board of Governors, Jerome Powell, clearly declared that without “clear support from the executive branch and from Congress, ideally in the form of a specific authorizing law,”⁹³ the digital currency of the central bank will not be issued. There is nothing else left for the Fed, CBDC is a new phenomenon and is logically not mentioned legislatively. Another key consideration for the Fed is the general public’s support for CBDC. According to his representatives, the Fed would not embark on this project in its’ lack.⁹⁴

Section 16 of the Fed Act of 1913 gives the institution the authority to issue Federal Reserve notes⁹⁵. At the time when the law was created, of

<https://www.federalreserve.gov/newsevents/speech/waller20221014a.htm>, accessed on 20.10.2023.

⁹³ The Federal Reserve. (2022), p. 3.

⁹⁴ Idem, p. 21.

⁹⁵ i.e., physical currency.

course the term banknote (notes) referred to a paper banknote. This is evidenced by various provisions that are closely related to the material from which the currency is made. Currently, there are also provisions that specify what the paper for banknotes should look like. Even the term currency is not precisely defined in this fundamental law⁹⁶, so theoretically, in my opinion, CBDC could be used. As far as legal tender in the USA is concerned, according to Section 5103 of Title 31 of the US Code, it is “coins and currency (including Federal reserve notes and circulating notes of Federal reserve banks and national banks).”⁹⁷ According to some lawyers⁹⁸, the word “including” demonstrates that this is an illustrative list, which can also give other official forms of currency the status of legal tender. The opponents, led by Paige Pidano Paridon from the American Bank Policy Institute, argue that it would have to be a very similar form of money as the given list (according to the legal principle of *esjudem generis*)⁹⁹.

⁹⁶ Currency was defined by FinCEN, a bureau of the Treasury as “[t]he coin and paper money of the United States or any other country that is designated as legal tender and that circulates and is customarily used and accepted as a medium of exchange in the country of issuance”, 31 C.F.R. § 1010.100(m). But, under the Federal Reserve Act FinCEN has no interpretive authority.

⁹⁷ 31 USC § 5103.

⁹⁸ Prates, M. (2021). “Legal troubles may delay CBDCs,” February 24, 2021, in Official Monetary and Financial Institutions Forum. According to him, U. S. “law stipulates that US ‘coins and currency (including Federal Reserve notes and circulating notes of Federal Reserve banks and national banks) are legal tender for all debts, public charges, taxes and dues’. The word ‘including’ hints that the list that follows is illustrative, allowing other currency formats to be legal tender.” Retrieved from: <https://www.omfif.org/2021/02/legal-troubles-may-delay-cbdcs/>, accessed on 25.10.2023.

⁹⁹ Pidano Paridon, P. (2021). “Legal Authority to Issue a US Central Bank Digital Currency,” Bank Policy Institute, 06.09.2021, retrieved 23.10.2023, Retrieved from:

It follows from the above that a legislative amendment is apparently necessary. From a legal point of view, another significant obstacle is the fact that the Fed cannot by law provide accounts to ordinary people, it mainly provides them to US depository institutions and the Treasury Department. Therefore, even a possible CBDC would have to be provided to people through intermediaries without changing the law¹⁰⁰, as the Fed cannot introduce a variant of CBDC without intermediaries. However, the Fed has long been in favor of an option with intermediaries, since without them CBDC could have a negative impact on banks¹⁰¹.

Referring to Jerome Powell's speech previously mentioned, it can be assumed which is the role of the Congress. The rather unclear part is the role of the executive. For example, because according to Section 419 of Title 12 of the US Code, printed banknotes are to be "delivered to the Board of Governors of the Federal Reserve System subject to the order of the Secretary of the Treasury."¹⁰² Moreover, it is the President's administration that controls various agencies, sets the agenda, and the President can also issue decrees and significantly influence the introduction of CBDCs.

All in all, already seen, a certain form of support exists on the side of the executive. President Biden issued a decree on March 9, 2022, regarding ensuring the responsible development of digital assets. In this decree, Joe

<https://bpi.com/legal-authority-to-issue-a-u-s-central-bank-digital-currency/>, accessed on 25.10.2023, p. 3.

¹⁰⁰ Prates, M. (2021). Op. Cit.

¹⁰¹ Board of Governors of the Federal Reserve System. (2022). Op. Cit.

¹⁰² 12 U.S. Code § 419 - Delivery of notes prior to delivery to banks

Biden stated that the research and development of the American CBDC is and will be given by his administration the “highest urgency.” In Section 4(c), President Biden told the Fed to continue researching, and even preparing a strategy for both the Fed and the US government, regarding the potential introduction and, most importantly, the launch of a digital dollar. In addition, Biden has directed the Attorney General to determine whether legislative change is necessary to implement a CBDC. Other ministries (notably Finance, Labor, and Homeland Security) and agencies were tasked with delivering reports on issues related to CBDCs (selecting, for example, consumer protection or criminal activity related to digital currency)¹⁰³.

Digital Asset Development Strategy

The results of the proceedings of a total of nine authorized bodies are summarized in the so-called fact sheet, which was issued by the White House on September 16, 2022. The government, industry representatives, academics and ordinary citizens took part in it¹⁰⁴. This document is further developed and specifies six main areas to focus on when preparing a CBDC:

1. consumer and investor protection

The document highlights the need to increase the security of those who use digital assets. Either through increased control of digital means of payment, but also through better information about them. In the United

¹⁰³ The White House. (2022). Op. Cit.

¹⁰⁴ Idem.

States, digital currencies are owned by up to 17%¹⁰⁵ of the adult population. A quarter of digital assets may have transparency issues.

2. financial inclusion

About 7 million Americans do not have a bank account, and another 24 million still rely on non-bank services such as checks and money orders. From July 2023, the new settlement system “FedNow Service”¹⁰⁶ will speed up interbank payments, which will make payments immediately.

3. support of financial stability

The May 2022 cryptocurrency market crash is cited in the White House document¹⁰⁷ as an example of the risk of financial instability. In the future, this should primarily be prevented by the Ministry of Finance with the help of more intensive cooperation with financial institutions and friendly international organizations such as the OECD or the FSB.

4. responsible innovation

In order for American companies to continue to lead in the field of innovation, the Biden administration wants to establish at its affiliated

¹⁰⁵ Faverio M. & Sidoti, O. (2023). “Overall, 17% of U.S. adults say they have ever invested in, traded or used a cryptocurrency,” Pew Research Center, 10.10.2023, retrieved from <https://www.pewresearch.org/short-reads/2023/04/10/majority-of-americans-arent-confident-in-the-safety-and-reliability-of-cryptocurrency/>, accessed on 25.10.2023.

¹⁰⁶ BOARD OF GOVERNORS of the FEDERAL RESERVE SYSTEM. (2023). Federal Reserve announces July launch for the FedNow Service. Press Release March 15, 2023, retrieved from: <https://www.federalreserve.gov/newsevents/pressreleases/other20230315a.htm>, accessed on 25.10.2023.

¹⁰⁷ The White House. (2022).

organizations (Ministry of Finance, Commerce or Energy) various forums and add to them an agenda related to digital matters¹⁰⁸.

5. US leadership in the global financial system and economic competitiveness

In this area, the US government wants to strengthen its influence by spreading American values in the field of digital assets.

6. fight against illegal financial practices

Although the US is one of the countries with the most developed anti-money laundering and terrorist financing technologies, the digital age brings new challenges. The administration recognizes that cryptocurrencies can be used to finance drug trafficking, cybercriminals, and criminal regimes (such as the DPRK). The President wants to consider pressing Congress to change the Bank Secrecy Act to ban unlicensed money transfers.¹⁰⁹

Only at the very end of the document can you find a section on CBDC. Her role is supposed to be saving – solving all 6 problems mentioned above. But the Fed received not only verbal support, an interdepartmental group was created at the Ministry of Finance, dealing with CBDC. Key representatives of the Fed, the NEC¹¹⁰, the National Security Council, the Office for Science and Technology Policy and of the Ministry of Finance, are supposed to meet regularly.¹¹¹

¹⁰⁸ Idem.

¹⁰⁹ Idem.

¹¹⁰ National Economic Council.

¹¹¹ The White House. (2022).

One of the conditions that the Fed sets for the introduction of CBDC - the support of the executive - is thus largely fulfilled. However, it is clear that the President puts the benefits for ordinary people first (consumer protection, even from failing cryptocurrencies, financial inclusion and equality), because he is elected by them. On the other hand, the Fed's main motivations for introducing CBDC are rather the "possible future capabilities"¹¹² of CBDC. The Fed lists new monetary policy instruments, improvement of payment methods, and support of the dollar's global position as the first benefits¹¹³, it does not primarily look at CBDC as a tool for solving current problems.

Finding support from Congress is far more complicated. Its composition changes every two years. Additionally, a majority in both houses of Congress is needed to support the President's agenda, and this is rather difficult. However, if the Fed is talking about broad public support, it must (and wants to) find support for CBDC from both dominant American political parties – and therefore also from Republicans.

Legislation related to CBDCs began to appear in particular in the 117th Congress, in the session between 2021 and 2022. Of note during this period is House Bill 2211, introduced by Democrat Bill Foster on March

¹¹² Cheng, J. Lawson, A. N. and Wong, P. (2021). "Preconditions for a general-purpose central bank digital currency," FEDS Notes, Washington: Board of Governors of the Federal Reserve System, February 24, 2021, retrieved from: <https://www.federalreserve.gov/econres/notes/feds-notes/preconditions-for-a-general-purpose-central-bank-digital-currency-20210224.html>, accessed on 25.10.2023.

¹¹³ The Federal Reserve. (2022).

26, 2021¹¹⁴. The mission of this unapproved bill was to instruct the Fed, to study CBDC, especially since other countries are doing so as well. Without a digital version, the US currency could lose its status¹¹⁵. A law called the 21st century dollar by Republican Congressman French J. Hill was similarly proposed on May 25, 2021. It mainly draws attention to the danger to the dollar from the Chinese renminbi¹¹⁶. The Chinese threat is also mentioned in the law of Democratic Congressman Gregory W. Meeks from the same day.¹¹⁷ It even made it onto the calendar, however, it did not happen until 12/30/2022, so it did not have time to be discussed in the 117th Congress (unapproved bills end up in the “basket” with the new Congress). A strategy for the dollar, so that it could face the Chinese digital currency, was also required in section 912 by the law proposed by the Republican Congressman Jim Banks from July 2021¹¹⁸. The digital currency of the central bank (only the Chinese one) was also touched

¹¹⁴ See <https://www.billsponsor.com/bills/33910/house-bill-2211-congress-117>, accessed on 26.10.2023.

¹¹⁵ US Congress, House, Central Bank Digital Currency Study Act of 2021, HR 2211, 117th Congress, 1st Session, introduced in the House on 03/26/2021, retrieved from: <https://www.congress.gov/bill/117th-congress/house-bill/2211>, accessed on 26.10.2023.

¹¹⁶ US Congress, House, 21st Century Dollar Act, HR 3506, 117th Congress, 1st Session, introduced in the House on 5/25/2021, Retrieved from: https://www.govtrack.us/congress/bills/117/hr3506#google_vignette, accessed on 26.10.2023.

¹¹⁷ US Congress, House, Ensuring American Global Leadership and Engagement Act, HR 3524, 117 Congress, 1st session, proposed in the House of Representatives on 25/05/2021, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117hr3524ih>, accessed on 26.10.2023.

¹¹⁸ US Congress, House, Countering Communist China Act, HR 4792, 117th Congress, 1st Session, introduced in the House on 7/29/2021, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117hr4792ih>, accessed on 26.10.2023.

upon by the bill of the Republican Senator Rick Scott from February of the following year. He wanted to ban transactions using Chinese CBDC on the territory of the United States and to US citizens¹¹⁹. The US is targeting not only China but also Venezuela for its digital currency. A December 2022 bill by Republican Senator James Risch proposed a ban on US transactions with Venezuela's digital currency.¹²⁰

In July 2021, Democratic Congressman Donald S. Beyer introduced legislation to better control digital assets. CBDC is mentioned here in section 503, which is given to institutions such as the Ministry of Finance or the Board of Governors of the Fed to produce a report that clearly defines how CBDC differs from other digital assets¹²¹. In January 2022, Republican Congressman Tom Emmer introduced legislation to add a single sentence to the Fed Act that would prohibit Federal Reserve Banks from providing products and services (including CBDC) directly to

¹¹⁹ US Congress, Senate, Deterring Communist Chinese Aggression against Taiwan through Financial Sanctions Act of 2022, S 3735, 117th Congress, 2nd Session, proposed in the Senate 2.3. 2022, retrieved from: <https://www.govinfo.gov/content/pkg/BILLS-117hr7704ih/html/BILLS-117hr7704ih.htm>, accessed on 26.10.2023.

¹²⁰ US Congress, Senate, Venezuelan Democracy Act, S 5317, 117th Congress, 2nd Sess., proposed in the Senate 20/12/2022, retrieved from https://www.foreign.senate.gov/imo/media/doc/12-20-22_risch_rubio_venezuela_bill.pdf, accessed on 26.10.2023.

¹²¹ US Congress, House, Digital Asset Market Structure and Investor Protection Act, HR 4741, 117th Congress, 1st Session, introduced in the House on 7/28/2021, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117hr4741ih>, accessed on 26.10.2023.

individuals¹²². Republican Senator Ted Cruz's proposal of March 30, 2022 is also in the same spirit¹²³.

A March 2022 bill by Democratic Congressman Stephen F. Lynch called for research and implementation of electronic currency. According to this, it should preserve to the highest possible degree the privacy and anonymity that cash has. It should be issued by the Ministry of Finance and provided directly to the people. It would not be based on DLT. Therefore, it is not about CBDC, only electronic currency is being compared to it¹²⁴. In contrast, Republican Senator Mike Lee introduced a bill in September 2022 called "No CBDC." It passed two readings and was assigned to the Senate Committee on Banking, Housing and Urban Affairs. This legislation was intended to enact that "No Federal Reserve Bank, the Board, the Secretary of the Treasury, any other agency, or any entity directed to act on behalf of the Federal Reserve Bank, the Board, the Secretary, or other agency, may mint or issue a central bank digital

¹²² US Congress, House, To amend the Federal Reserve Act to prohibit the Federal reserve banks from offering certain products or services directly to an individual, and for other purposes, HR 6415, 117th Congress, 2nd Session, proposed in the House on 18/1/2022, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117hr6415ih>, accessed on 26.10.2023.

¹²³ US Congress, Senate, A bill to amend the Federal Reserve Act to prohibit the Federal reserve banks from offering certain products or services directly to an individual, and for other purposes, S 3954, 117th Congress, 2nd session, proposed in the Senate 30/03/2022, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117s3954is>, accessed on 26.10.2023.

¹²⁴ US Congress, House, ECASH Act, HR 7231, 117th Congress, 2nd Session, introduced in the House on 03/28/2022, retrieved from: <https://www.congress.gov/117/bills/hr7231/BILLS-117hr7231ih.pdf>, accessed on 26.10.2023.

currency directly to an individual[...].”¹²⁵ His fellow Republican Senator James Lankford with his proposal from the same month wanted to regulate that CBDC is not legal tender according to of Section 5103 of Title 31 of the United States Code. Furthermore, in the proposal, he sought to ensure that the minting of cash does not stop when issuing CBDC.¹²⁶

However, none of the above-mentioned proposals went through the complete legislative process and did not become law. However, since all the aforementioned politicians are also in the current 118th Congress, it can be assumed that they (as well as their colleagues) will come up with similar legislation in this period as well. Cruz, Emmer, Luetkemeyer, Lee and Scott have already done so. Likewise, French Hill came out again on January 26, 2023 with his bill called the 21st century dollar¹²⁷. Republicans now have a majority in the House, so the chance of approval in this chamber is greater than a year ago (but it is not a comfortable and certainly not a homogeneous majority). However, it is not a detailed or groundbreaking proposal.

¹²⁵ US Congress, Senate, No CBDC Act, S 4831, 117th Congress, 2nd Sess., proposed in the Senate on 9/13/2022, retrieved from: <https://www.lee.senate.gov/services/files/D9EE948C-BA22-40F7-ADDC-3CEB6AA9791D>, accessed on 26.10.2023.

¹²⁶ US Congress, Senate, No Digital Dollar Act, S 4994, 117th Congress, 2nd Sess., proposed in the Senate on 9/28/2022, retrieved from: <https://www.govinfo.gov/content/pkg/BILLS-117s4994is/pdf/BILLS-117s4994is.pdf>, accessed on 26.10.2023.

¹²⁷ US Congress, Senate, H.R. 556: 21st Century Dollar Act, 118th Congress, proposed in the Senate on 26/01/2023, retrieved from: <https://www.govtrack.us/congress/bills/118/hr556>, accessed on 26.10.2023.

The number of CBDC-related laws mentioned above proves that this is a topic that resonates a lot in the US Congress. More proposals will certainly be presented in the coming months. For the possible introduction of CBDC, it will be necessary to change the “wording” in the Fed Act, as well as other laws related to privacy and consumer protection. But if the Democratic proposals did not pass even when the party controlled both chambers, it cannot be assumed that, after the Republicans won the majority in the House of Representatives, the 118th Congress will be more successful in this regard.

On the other hand, the Fed requires agreement across the political spectrum, and that may not be hindered by the current situation where each chamber of Congress is controlled by a different party. In addition, more bills came from Republican members of Congress (10 out of 14), despite the fact that, in principle, the party seeks less government intervention (mainly in the economic area). The sight of China’s success with CBDC and the possibility of losing America’s dominant position in the field of innovation may drive that side to support CBDC as well. In addition to the already mentioned efforts to maintain the position of the dollar as a world reserve currency, Republicans are also interested in not limiting the development of stablecoins and other private sector innovations, as well as the privacy and security of potential payments using CBDC¹²⁸. It is also evident from the legislative proposals that there is a

¹²⁸ “Committee Republicans Release Central Bank Digital Currency Principles,” Financial Services Committee, Washington, 11/15/2021, retrieved from:

large group of those in the Republican Party who do not want to give the Fed additional powers. The very fact that, unlike federal agencies, the Fed is not accountable to Congress, its budget is independent of Congress, and the governors have really long, 14-year terms of office does not make this institution trustable. The strengthening of his role is therefore perceived by some with displeasure, and this is illustrated by the Republican's proposals of Emmer, Lankford or Cruz. On the other hand, a possible bipartisan agreement can be assumed on the issue of resisting the Chinese threat. The further development of the legislation will therefore mainly respond to the development and results of implementation on the Chinese side.

3.5. The Digital Euro

Since the first months of Lagarde's presidency, members of the Executive Committee of the ECB have begun to mention the possibility of evaluating the issuance of an instrument of that kind also within the Eurozone. In October 2020, Christine Lagarde stated that "Europeans are increasingly turning to digital in the ways they spend, save and invest. Our role is to secure trust in money. This means making sure the euro is fit for the digital age. We should be prepared to issue a digital euro, should the

<https://financialservices.house.gov/news/documentsingle.aspx?DocumentID=408195>, accessed on 26.10.2023.

need arise.”¹²⁹ This was among the first signals of a careful consideration of a digital euro.

According to a report issued by the European Central Bank in 2020, the European Union understands that the speed of innovation and the adoption of millions of users worldwide is a proof of an increasing preference on the part of users of digital payment methods. Therefore, the trend in the financial system is the adoption of an increasingly digitalized method. From this perspective, in January 2020, the Council of the European Central Bank established a “High-Level Task Force”¹³⁰ aiming to accelerate research on CBDCs for the euro area.

In this regard, the “Annual Report 2020” published by ECB, stated that a digital euro “could support the digitalization of the European financial markets and the EU economy as a whole, and strengthen their strategic independence.”¹³¹ The European Central Bank (ECB) published a report on the digital euro for the first time in October 2020¹³². When publishing the report, the ECB also surveyed citizens and companies about the project. According to initial results, 41% of respondents named data protection as the most important property of the digital euro, followed by

¹²⁹ ECB. (2020). ECB intensifies its work on a digital euro, Speech by Christine Lagarde, Retrieved from: <https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr201002~f90bfc94a8.en.html>, accessed on 24.10.2023.

¹³⁰ Mersch Y. (2020). *An ECB digital currency – a flight of fancy?* Speech by Yves Mersch, Member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the ECB, at the Consensus 2020 virtual conference, 11 May 2020.

¹³¹ ECB. (2020). Annual Report 2020, p. 71.

¹³² Idem.

anonymity¹³³. This report supports the ideas stated in the previous one, according to which the digital euro: “may be a way to foster the digitalization of the economy, supporting the development of innovative European solutions in all kinds of industries. This is because the digital euro would have the potential to fill gaps in the offering of digital payment solutions and functionalities, as well as the economy as a whole.”¹³⁴ In the same report, the ECB makes reference to other advantages of the CBDC, as well. In this vein, another advantage of a CBDC would be the reduction of costs for payment service providers, which would result in improving business efficiency¹³⁵. In this sense, the Report states that a digital euro could also help in facilitating “the development by supervised intermediaries of a full range of pan-European end-user solutions accessible to consumers. These end-users solutions could be used for the distribution of both commercial money and central bank money.”¹³⁶ Taking into account this particular perspective, the digital euro issuance could support the preservation of the European autonomy in such a key sector as retail payments.

¹³³ *Idem*.

¹³⁴ ECB (2020a), Report on a digital euro, retrieved from: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf, accessed on 13.10.2023.

¹³⁵ *Idem*, p. 10.

¹³⁶ *Idem*, p. 10.

In July 2021, ECB announced a 24-month research phase for the “digital euro” project¹³⁷, which was supposed to explore the potential of both retail and wholesale CBDC necessary to determine the purpose and design of a possible Digital Euro. On that occasion, the establishment of a Digital Euro Market Advisory Group¹³⁸ was also envisaged (created in October 2021) aimed at involving, in the investigation phase, market representatives with in-depth knowledge of the payments sector; similarly, it has been established that the Euro Retail Payments Board is periodically consulted and informed on the topic.

In September and December of 2022, the ECB published two progress reports: “Progress on the investigation phase of a digital Euro”¹³⁹, and “Progress on the investigation phase of a digital euro – second report,”¹⁴⁰ and further on, in 2023, also in two phases, the High-Level Task Force

¹³⁷ ECB (2021), ECB digital euro consultation ends with record level of public feedback, Retrieved from: <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210113~ec9929f446.en.html>, accessed on 13.10.2023.

¹³⁸ ECB. (2021a). ECB announces members of Digital Euro Market Advisory Group. 25 October 2021, retrieved from: <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr211025~08af93ada7.en.html>, accessed on 25.10.2023.

¹³⁹ ECB. (2022). Progress on the investigation phase of a digital euro. September 2022, retrieved from: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov220929.en.pdf?f91e0b8ff8cbd6654d7e6b071a8f7071, accessed on 25.10.2023.

¹⁴⁰ ECB. (2022a). Progress on the investigation phase of a digital euro – second report. 21 December 2022. Retrieved from: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov221221_Progress.en.pdf?f91e0b8ff8cbd6654d7e6b071a8f7071, accessed on 25.10.2023.

created the Rulebook Development Group¹⁴¹, a group (made up of both representatives of the public and private spheres) with the aim of drafting, on the basis of the indications of the Governing Council of the ECB, a set of rules and parameters intended to regulate the distribution of the Digital Euro to intermediaries. On 24 April 2023, the third progress report¹⁴² was published, while on 13 July - following the presentation of the European Commission's proposed Regulation –the fourth progress report¹⁴³ has been issued.

In the same time, on the 5th of April 2022 ECB launched a specific consultation on the introduction of a digital euro. This process suggests that the digital euro is a complex undertaking - the implications for the financial sector and macroeconomic effects being currently too unclear. For this reason, a certain degree of caution on the part of the ECB is

¹⁴¹ On 3 January 2023 the ECB published the call for the selection of the members of the Group. On February 15th were published the names of the 22 people selected. For more information see: ECB. (2023) ECB nominates members for the Rulebook Development Group for a digital euro. Press Release 15 February 2023. Retrieved from: <https://www.ecb.europa.eu/paym/intro/news/html/ecb.mipnews230215.en.html>, accessed on 25.10.2023. According to the Press Release, “Group members will contribute to the drafting of a rulebook for a digital euro scheme. The Rulebook Development Group includes professionals from the private and public sector. The group will hold monthly meetings, starting February 2023.”

¹⁴² ECB. (2023a). ECB publishes progress report on digital euro and study on possible features of a digital wallet. 24 April 2023, retrieved from: https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr230424_1~395626f0d9.en.html, accessed on 25.10.2023.

¹⁴³ ECB. (2023b). Progress on the investigation phase of a digital euro - fourth report. 13 July 2023. Retrieved from: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov230713-fourth-progress-report-digital-euro-investigation-phase.en.pdf, accessed on 25.10.2023.

entirely understandable. However, it must also be emphasized that Sweden and China have a clear lead.

Simultaneously, it became clear that, for a digital euro to be introduced, a regulation in this respect must be enacted. By consequence, on the 28th of June 2023, the European Commission put forward a digital euro package prerogative made up of “two proposals within a ‘single currency package’ to ensure that individuals and businesses can continue to access and pay with euro banknotes and coins across the euro area, and to set out a framework for a possible new digital form of the euro that the European Central Bank could choose to issue in the future, as a complement to cash.”¹⁴⁴ ECB has drawn the following timeline regarding the conception of the digital Euro:

¹⁴⁴ European Commission, (2023), Digital euro package. Directorate-General for Financial Stability, Financial Services and Capital Markets Union, retrieved from: https://finance.ec.europa.eu/publications/digital-euro-package_en#legislative, accessed on 13.10.2023. See also: European Commission. (2023). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro COM/2023/369 final, retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023PC0369>, accessed on 13.10.2023; European Commission (2023). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the legal tender of euro banknotes and coins COM/2023/364 final, retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023PC0364>, accessed on 13.10.2023.

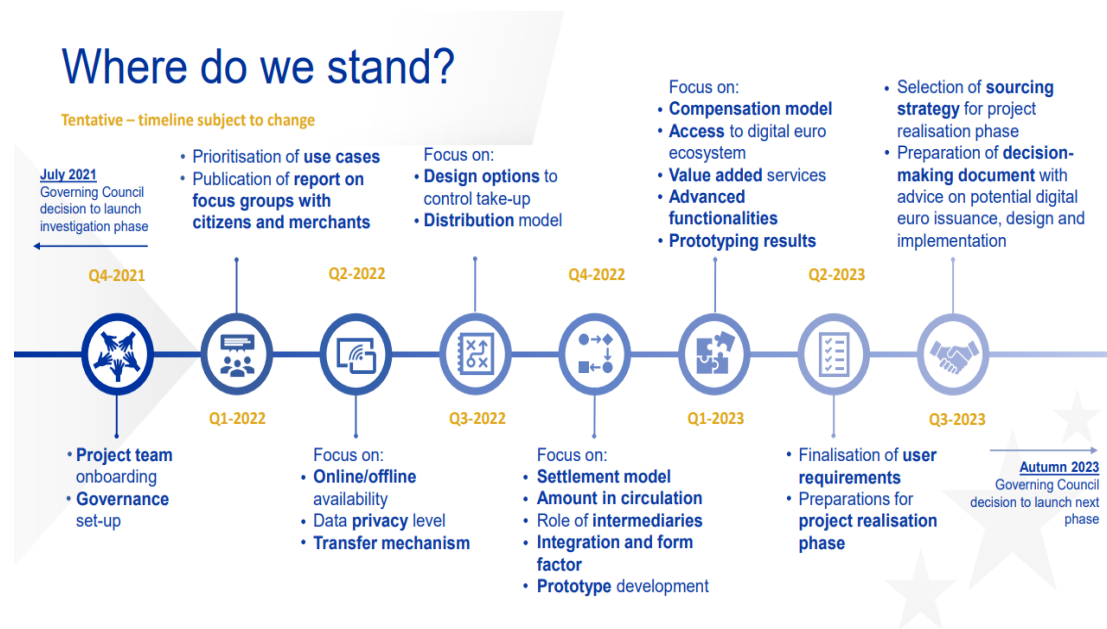


Figure 1. Timeline regarding the conception of the digital Euro

Source: ECB. (2023). Digital euro, ecb.europa.eu - retrieved from: https://www.ecb.europa.eu/paym/digital_euro/shared/pdf/Digital_euro_project_timeline.en.pdf, accessed on 18.10.2023.

The investigation phase mentioned above should be concluded this fall, in October 2023, when the EU should finally determine whether it is worth introducing the digital currency of the central bank, and what the next stage should be. This possible new phase implies the development and test of technical solutions and business preparatory measures. In this context, on October 6, 2023, in a letter sent to the members of the European Parliament by Fabio Panetta on the request of postponement of the

decision on the digital euro, he clarified that, “the next phase of the digital euro project – should the ECB’s Governing Council decide to go ahead with it – would only focus on further exploring and testing certain design aspects and functionalities of a potential digital euro. This would make it a preparation phase rather than a ‘realization phase’.”¹⁴⁵ In addition, Panetta stipulated that the issuance of a digital euro would be possible just after the adoption of the relevant regulations, and by consequence after implementing the requested adjustments to the digital euro after the legislative consultations. Therefore, a new phase in this project would involve more technical preparations which in the end would serve as information for the legislative procedure.

4. Legal Considerations Regarding a Digital Euro. Controversies

The choice of which European Union primary law to use will depend on the structure the digital euro will have and the purpose for which it is issued; the two articles that the Euro system is most inclined to rely on are articles 127(2) and 128 of the Treaty on the Functioning of the European

¹⁴⁵ Panetta, F. (2023), Letter from Fabio Panetta to several MEPs on the request to postpone the decision on digital euro. Retrieved from: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov231006_Letter_from_Fabio_Panetta_to_several_MEPs_on_request_to_postpone_the_decision_on_the_digital_euro.en.pdf?ffba66151e533bfab912c2d52742263f, accessed on 18.10.2023.

Union (TFEU). Art. 127(2) of the TFEU¹⁴⁶ defines the fundamental tasks to be carried out by the ESCB and the promotion of the regular functioning of payment systems.

In the event that the digital euro is issued as a monetary policy instrument, similar to central bank reserves and accessible only to central bank counterparties, the Euro system could invoke the aforementioned article in conjunction with Art. 20 of the Statute of the ESCB, which provides that “The Governing Council may, by a majority of two thirds of the votes cast, decide upon the use of such other operational methods of monetary control as it sees fit [...]”¹⁴⁷. The digital euro would therefore be understood as one of the operational tools to control the ECB’s monetary policy.

If the digital euro is introduced to be made available to private individuals through accounts held with the Euro system, art. 127(2) could be used in conjunction with Art. 17 of the Statute of the ESCB, which provides for the opening by the ECB (and national central banks) of “accounts for credit institutions, public entities and other market participants and accept assets, including book entry securities, as collateral.”¹⁴⁸

¹⁴⁶ Art. 127(2) of the TFEU: “The fundamental tasks to be carried out by the ESCB are the following: define and implement the Union’s monetary policy, carry out foreign exchange operations in line with the provisions of the art. 219, hold and manage the official foreign exchange reserves of Member States, promote the smooth functioning of payment systems.”

¹⁴⁷ ECB. (2002). PROTOCOL ON THE STATUTE OF THE EUROPEAN SYSTEM OF CENTRAL BANKS AND OF THE EUROPEAN CENTRAL BANK, Art. 20. Retrieved from: https://www.ecb.europa.eu/ecb/pdf/orga/escbstatutes_en.pdf, accessed on 26.10.2023.

¹⁴⁸ *Idem*, art. 17.

Furthermore, in the case of the issuance of the digital euro as a means of settlement of specific types of payments, Article 127(2) of the TFEU, which lists the promotion of the functioning of payment systems among the tasks of the ESCB, could be used in conjunction with the art. 22 of the Statute of the ESCB¹⁴⁹, which provides for the possibility for the ECB to issue regulations in order to guarantee the efficiency and reliability of payment systems within the Union. The digital euro would therefore be understood as a means used by the ECB to improve the currently existing payment system.

If it is decided to issue the digital euro as an instrument comparable to a banknote, the most suitable legal basis for the Euro system would be art. 128 of the TFEU¹⁵⁰ in conjunction with art. 16 of the Statute of the ESCB¹⁵¹. In fact, the art. 128 of the TFEU gives the ECB the exclusive

¹⁴⁹ Art. 22 of the Statute of the ESCB: “The ECB and the national central banks may provide facilities, and the ECB may establish regulations, in order to ensure efficient and reliable clearing and payment systems within the Union and in relations with third countries”.

¹⁵⁰ Art. 128 of the TFEU: “1. The European Central Bank shall have the exclusive right to authorize the issue of euro banknotes within the Union. The European Central Bank and the national central banks may issue such notes. The banknotes issued by the European Central Bank and the national central banks shall be the only such notes to have the status of legal tender within the Union.

2. Member States may issue euro coins subject to approval by the European Central Bank of the volume of the issue. The Council, on a proposal from the Commission and after consulting the European Parliament and the European Central Bank, may adopt measures to harmonize the denominations and technical specifications of all coins intended for circulation to the extent necessary to permit their smooth circulation within the Union.”

¹⁵¹ Article 16 of the Statute of the ESCB: “In accordance with Article 106(1) of this Treaty, the Governing Council shall have the exclusive right to authorize the issue of banknotes within the Community. The ECB and the national central banks may issue such notes. The banknotes issued by the ECB and the national central banks shall be the

right to authorize the issue of euro banknotes within the European Union; by appealing to these two articles, the ECB would consequently also have the exclusivity of issuing the digital euro.

In general, invoking art. 128 of the TFEU would offer the Euro system the widest discretion for issuing a digital euro with legal tender status, while the use of art. 127(2) of the TFEU would be more in line with the issuance of digital euro variants for limited uses, therefore not having legal tender status.

Although it appears from primary law that euro banknotes issued by the ECB are the only instruments that have legal tender status, the issuance by the Euro system of assets or bonds other than euro banknotes is not excluded either by the TFEU or by the Statute of the ESCB which could enjoy legal tender status. In the event that the digital euro is treated in the same way as banknotes, then the “exclusive right of the ECB to authorize the issuance of euro banknotes within the Union”, pursuant to art. 128 of the TFEU, could be invoked and in this case the digital euro will be legal tender.

Still starting from art. 133 of the TFEU, according to which, “without prejudice to the powers of the European Central Bank, the European Parliament and the Council, acting in accordance with the ordinary legislative procedure, shall lay down the measures necessary for the use of

only such notes to have the status of legal tender within the Community. The ECB shall respect as far as possible existing practices regarding the issue and design of banknotes.”

the euro as the single currency,”¹⁵² it is necessary to draw up an act of secondary law.

In the writer’s view, even the possibility of jointly invoking Articles 127 and 128 TFEU, together with Articles 16 and 17 of the ESCB Statute, should not be discarded *a priori*. Indeed, in this circumstance, the existence of multiple objectives that can be pursued by the ECB — conduct of monetary policy and “updating” of the banknotes issued by the Euro system - seems to clearly exist and, in the same way, it seems reasonable to state that neither of these two purposes is secondary to the other; furthermore, it should be underlined that the rules considered would not lead to incompatible procedural processes.

5. Conclusions

Considering the information presented above, it is clear that cryptocurrencies, whether private or public, will be a future part of the global financial and monetary system. Therefore, it is imperative that countries begin to gradually adopt the use of digital currencies. However, a change of this magnitude requires plans and studies that are capable of understanding the social and economic impact of adopting this new model, while also focusing on regulations and supervision. Summing up, there is broad agreement at the international level on the possibly key role

¹⁵² art. 133 of the TFEU.

of CBDCs backed by central banks and particularly of the digital euro, in the digital transformation of the monetary and financial sphere. In addition, political factors are also putting pressure on regulators to modernize the financial regulatory framework and adapt it to the era of digital finance. Because of the innovations brought by CBDCs, however, more research is necessary for a better understanding of their advantages and disadvantages while also taking into account if the efforts pay off. This implies that there will be no rapid adoption of the digital euro, digital dollar or digital pound, which means that these CBDCs will continue lagging far behind China. However, in spite of the international ambitions regarding the e-CNY, it is difficult for China to comply these expectations. So far, the United States, the United Kingdom and the European Union voted in favor of precaution, detailed analysis and regulatory reflections, seeing them as absolutely necessary before rushing these projects into fruition. There are still no estimates if and when the United States might introduce a CBDC. To illustrate, one can take for example China, where research began in 2014, the pilot phase started six years later, and in 2022 it expanded to other regions of China. If the pace of implementation in the US is similar to that in China, the introduction of CBDC in the United States could not happen until the early 2030s. However, this author believes that the dollar's dominance will continue to be indestructible for the time being.

At the same time, while considering the Digital Euro, another aspect worthy of attention is that underlined by Fabio Panetta¹⁵³ who stated how the reasons behind a possible launch of the Digital Euro are substantially taking into account “preserving monetary sovereignty in the digital age”¹⁵⁴. According to him, the Digital Euro is primarily aimed at protecting the power of the state, responding thus not only to the challenge posed by the private sector but also to that posed by foreign nations which focus on expanding or consolidating their global sphere of influence. So far, there is still no certainty that the digital euro will become a reality in the daily lives of citizens; everything depends on the will of the Euro system and on the future developments that will be observed in the payments sector.

¹⁵³ Panetta, F. (2023). Shaping Europe’s digital future: the path towards a digital euro. Introductory statement by Fabio Panetta, Member of the Executive Board of the ECB, at the Committee on Economic and Monetary Affairs of the European Parliament, Brussels, 4 September 2023. In his speech, he stated that: “A digital euro will make our money fit for the digital age. It follows in the footsteps of the architects of the euro, who rightly believed that the currency union would only be complete with a tangible form of the euro, issued by the central bank. The digital euro takes their vision forward into a digitalised world. By providing an electronic form of cash, it will preserve people’s freedom to choose between private and public forms of our single currency for their everyday payments. [...] It is also an opportunity for Europe to lead the international debate on central bank digital currency, with a strong focus on privacy and preserving monetary sovereignty in the digital age.” Retrieved from: <https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230904~8f5dff1e57.en.html>, accessed on 26.10.2023.

¹⁵⁴ Idem.

References

- Ahiabenu, K. (2022). A comparative study of the design frameworks of the Ghanaian and Nigerian central banks' digital currencies (CBDC). *FinTech*, 1(3), 235-249.
- Allen, F., Gu, X., & Jagtiani, J. (2022). Fintech, cryptocurrencies, and CBDC: Financial structural transformation in China. *Journal of International Money and Finance*, 124, 102625.
- Armas, A., Ruiz, L., & Vásquez, J. L. (2022). Assessing CBDC potential for developing payment systems and promoting financial inclusion in Peru. *BIS Papers chapters*, 123, 131-151.
- Armelius, H., Guibourg, G., Johansson, S., & Schmalholz, J. (2020). E-krona design models: pros, cons and trade-offs. *Sveriges Riksbank Economic Review*, 2, 80-96.
- Azar, P. D., Baughman, G., Carapella, F., Gerszten, J., Lubis, A., Perez-Sangimino, J. P., ... & Rappoport W, D. E. (2022). The financial stability implications of digital assets. *FRB of New York Staff Report*, (1034).
- Aysan, A. F., & Kayani, F. N. (2022). China's transition to a digital currency does it threaten dollarization?. *Asia and the Global Economy*, 2(1), 100023.
- Bacchetta, P., & Perazzi, E. (2022). CBDC as imperfect substitute for bank deposits: a macroeconomic perspective. *Swiss Finance Institute Research Paper*, (21-81).

Bank of Canada. Kiff, M. J., Alwazir, J., Davidovic, S., Farias, A., Khan, M. A., Khiaonarong, M. T., ... & Zhou, P. (2020). A survey of research on retail central bank digital currency.

Bank of England. (2023). What is CBDC? Retrieved from: <https://www.bankofengland.co.uk/explainers/what-is-a-central-bank-digital-currency>, accessed on 13.10.2023.

Bank of England and HM Treasury (2023). The digital pound: A new form of money for households and businesses? Consultation Paper, February 2023. Retrieved from: <https://www.bankofengland.co.uk/paper/2023/the-digital-pound-consultation-paper>, accessed on 20.10.2023.

Bank of England. (2023). The digital pound: Technology Working Paper. Technical report, February 2023. Retrieved from: <https://www.bankofengland.co.uk/paper/2023/the-digital-pound-technology-working-paper>, accessed on 20.10.2023.

Bank of England. (2023). The digital pound. Retrieved from: <https://www.bankofengland.co.uk/the-digital-pound>, accessed on 20.10.2023.

Bibi, S., & Canelli, R. (2023). The interpretation of CBDC within an endogenous money framework. *Research in International Business and Finance*, 65, 101970.

Bilotta, N. (2021). An international digital Yuan:(Vane) ambitions, (excessive) alarmism and (pragmatic) expectations. *LAI Commentaries*, (21), 44.

Bindseil, U. (2019). Central bank digital currency: Financial system implications and control. *International Journal of Political Economy*, 48(4), 303-335;

Bindseil, U. (2020). Tiered CBDC and the financial system. *Available at SSRN 3513422*.

Bindseil, U. (2022). Central Bank Digital Currencies in a World with Negative Nominal Interest Rates. In *The Future of Financial Systems in the Digital Age: Perspectives from Europe and Japan* (pp. 75-88). Singapore: Springer Singapore.

Bindseil, U., Panetta, F., & Terol, I. (2021). Central Bank Digital Currency: functional scope, pricing and controls. *ECB Occasional Paper*, (2021/286).

BIS (2020). Central bank digital currencies: foundational principles and core features, p. 3. Retrieved from: <https://www.bis.org/publ/othp33.pdf>, accessed on 13.10.2023.

BIS. (2018). Central bank digital currencies. *Committee on Payments and Market Infrastructures Markets Committee*, No. 174, p. 3, Retrieved from: <https://www.bis.org/cpmi/publ/d174.pdf>, accessed on 13.10.2023.

Bludnik, I. (2023). Central Bank Digital Currency and the Cashless Economy: The African Experience. *European Research Studies Journal*, 26(3).

BOARD OF GOVERNORS of the FEDERAL RESERVE SYSTEM. (2023). Federal Reserve announces July launch for the FedNow Service. Press Release March 15, 2023, retrieved from: <https://www.federalreserve.gov/newsevents/pressreleases/other20230315a.htm>, accessed on 25.10.2023.

- Carstens, A. (2020). Shaping the future of payments. *BIS Quarterly Review, March*; Chorzempa, M. (2021). China, the United States, and central bank digital currencies: how important is it to be first?. *China Economic Journal, 14*(1), 102-115.
- Chen, S., Goel, T., Qiu, H., & Shim, I. (2022). CBDCs in emerging market economies. *BIS Papers*.
- Cheng, P. (2023). Decoding the rise of Central Bank Digital Currency in China: designs, problems, and prospects. *Journal of Banking Regulation, 24*(2), 156-170.
- Cheng, J. Lawson, A. N. and Wong, P. (2021). “Preconditions for a general-purpose central bank digital currency,” FEDS Notes, Washington: Board of Governors of the Federal Reserve System, February 24, 2021, retrieved from: <https://www.federalreserve.gov/econres/notes/feds-notes/preconditions-for-a-general-purpose-central-bank-digital-currency-20210224.html>, accessed on 25.10.2023.
- Chukwuere, J. E. (2021). The eNaira-Opportunities and challenges. *Journal of Emerging Technologies, 1*(1), 72-77.
- Chukwuere, J. E. (2021). The eNaira-Opportunities and challenges. *Journal of Emerging Technologies, 1*(1), 72-77.
- Corbet, S. (2023). Introduction to the Review of Corporate Finance, Special Issue on ‘Cryptocurrencies and Monetary Policy’. *Review of Corporate Finance, 3*(4).
- Crawford, J. (2023). The Dollar Dilemma: Hegemony, Control, and the Dollar’s International Role. *Virginia Law & Business Review, Forthcoming*.

Dakila Jr, F. G. (2022). Deliberations of an emerging market economy central bank on central bank digital currencies. *BIS Papers chapters, 123*, 153-160.

ECB. (2020). ECB intensifies its work on a digital euro, Christine Lagarde, Retrieved from: <https://www.ecb.europa.eu/press/pr/date/2020/html/ecb.pr201002~f90bfc94a8.en.html>, accessed on 24.10.2023.

ECB (2020a), Report on a digital euro, retrieved from: https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf, accessed on 13.10.2023.

ECB (2021), ECB digital euro consultation ends with record level of public feedback, Retrieved from: <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210113~ec9929f446.en.html>, accessed on 13.10.2023.

ECB. (2021a). ECB announces members of Digital Euro Market Advisory Group. 25 October 2021, retrieved from: <https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr211025~08af93ada7.en.html>, accessed on 25.10.2023.

ECB. (2022). Progress on the investigation phase of a digital euro. September 2022, retrieved from: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov220929.en.pdf?8eec0678b57e98372a7ae6b59047604b, accessed on 25.10.2023.

ECB. (2022a). Progress on the investigation phase of a digital euro – second report. 21 December 2022. Retrieved from: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov221221_Progress.en.pdf?91e0b8ff8cbd6654d7e6b071a8f7071, accessed on 25.10.2023.

ECB. (2023) ECB nominates members for the Rulebook Development Group for a digital euro. Press Release 15 February 2023. Retrieved from: <https://www.ecb.europa.eu/paym/intro/news/html/ecb.mipnews230215.en.html>, accessed on 25.10.2023.

ECB. (2023a). ECB publishes progress report on digital euro and study on possible features of a digital wallet. 24 April 2023. Retrieved from: https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr230424_1~395626f0d9.en.html, accessed on 25.10.2023.

ECB. (2023b). Progress on the investigation phase of a digital euro – fourth report. 13 July 2023. Retrieved from: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov230713-fourth-progress-report-digital-euro-investigation-phase.en.pdf, accessed on 25.10.2023.

ECB. (2002). PROTOCOL ON THE STATUTE OF THE EUROPEAN SYSTEM OF CENTRAL BANKS AND OF THE EUROPEAN CENTRAL BANK. Retrieved from: https://www.ecb.europa.eu/ecb/pdf/orga/escbstatutes_en.pdf, accessed on 26.10.2023.

Echarte Fernández, M. Á., Náñez Alonso, S. L., Jorge-Vázquez, J., & Reier Forradellas, R. F. (2021). Central banks' monetary policy in the face of the COVID-19 economic crisis: Monetary stimulus and the emergence of CBDCs. *Sustainability*, 13(8), 4242;

European Commission (2023). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the legal tender of euro banknotes and coins COM/2023/364 final, retrieved from: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023PC0364>, accessed on 13.10.2023.

European Commission, (2023), Digital euro package. Directorate-General for Financial Stability, Financial Services and Capital Markets Union, retrieved from: https://finance.ec.europa.eu/publications/digital-euro-package_en#legislative, accessed on 13.10.2023.

European Commission, (2023). BRIEFING EU Legislation in Progress. Digital euro package. *Directorate-General for Financial Stability, Financial Services and Capital Markets Union*. Retrieved from: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI\(2023\)751477_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI(2023)751477_EN.pdf), accessed on 16.10.2023.

European Commission, (2023). BRIEFING EU Legislation in Progress. Digital euro package. Directorate-General for Financial Stability, Financial Services and Capital Markets Union, Martin Höflmayr (author), Retrieved from:

[https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI\(2023\)751477_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/751477/EPRS_BRI(2023)751477_EN.pdf), accessed on 13.10.2023.

European Commission. (2023). Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the establishment of the digital euro COM/2023/369 final, retrieved from: [https://eur-lex.europa.eu/legal-](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023PC0369)

[content/EN/TXT/?uri=CELEX:52023PC0369](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52023PC0369), accessed on 13.10.2023.

Fabian, O., Emeka, O., & Okeke Chinenye, J. (2022). E-naira digital currency and financial performance of listed deposit money banks in Nigeria. *International Journal of Trend in Scientific Research and Development*, 6(2), 222-229.

Fanusie, Y., J., & Jin, E., (2021). China's Digital Currency. Adding Financial Data to Digital Authoritarianism. *Energy, Economics & Security*. Center for a New American Security. Washington D.C.

Fanusie, Y., J., & Jin, E., (2021). China's Digital Currency. Adding Financial Data to Digital Authoritarianism. *Energy, Economics & Security*. Center for a New American Security. Washington D.C.

Faverio M. & Sidoti, O. (2023). "Overall, 17% of U.S. adults say they have ever invested in, traded or used a cryptocurrency," Pew Research Center, 10.10.2023, retrieved from <https://www.pewresearch.org/short-reads/2023/04/10/majority-of-americans-arent-confident-in-the-safety-and-reliability-of-cryptocurrency/>, accessed on 25.10.2023.

Financial Services Committee. (2021). "Committee Republicans Release Central Bank Digital Currency Principles," Washington, 11/15/2021, retrieved from:

<https://financialservices.house.gov/news/documentsingle.aspx?DocumentID=408195>, accessed on 26.10.2023.

Garratt, R., Yu, J., & Zhu, H. (2022). The case for convenience: how CBDC design choices impact monetary policy pass-through. BIS Working Papers No 1046. Monetary and Economic Department.

Gladstein, A. (2021). Financial Freedom and Privacy in the Post-Cash World. *Cato J.*, 41, 271.

Greenfield, R. (2023). The State of Cryptocurrency Regulation: Nigeria. *Available at SSRN 4531980*.

Han, A. S. (2021). Chinese fintech companies and their “going out” strategies. *Journal of Internet and Digital Economics*, 1(1), 47-63.

House of Lords Economic Affairs Committee. (2022). *Central bank digital currencies: a solution in search of a problem?* 3rd Report of Session 2021–22 (2022). Retrieved from: <https://publications.parliament.uk/pa/ld5802/ldselect/ldeconaf/131/131.pdf>, accessed on 24.10.2023.

Huang, R. H., & Li, S. X. (2023). China’s Pursuit of Central Bank Digital Currency: Reasons, Prospects and Implications. *Banking & Finance Law Review*, 39(3), 409-443.




Huber, J. (2023). *The Monetary Turning Point: From Bank Money to Central Bank Digital Currency (CBDC)*. Springer Nature.

IMF (Stanley A.) (September 2022). The Ascent of CBDCs. More than half of the world’s central banks are exploring or developing digital currencies *Finance & Development*, p. 48, Available at:

<https://www.imf.org/en/Publications/fandd/issues/2022/09/Picture-this-The-ascent-of-CBDCs>, retrieved on 6.10.2023.

IMF (Stanley A.) (September 2022). The Ascent of CBDCs. More than half of the world's central banks are exploring or developing digital currencies *Finance & Development*. Retrieved from: <https://www.imf.org/en/Publications/fandd/issues/2022/09/Picture-this-The-ascent-of-CBDCs>, accessed on 13.10.2023.

IMF. (2023). IMF Approach to Central Bank Digital Currency Capacity Development. Policy Paper No. 2023/016. International Monetary Fund, Washington, D.C. Retrieved from: <https://www.imf.org/en/Publications/Policy-Papers/Issues/2023/04/12/IMF-Approach-to-Central-Bank-Digital-Currency-Capacity-Development-532177>, accessed on 15.10.2023.

Stanley, A. N. D. R. E. W. (2022). The ascent of CBDCs. *The Money Revolution*   : *Crypto, CBDCs, and the future of finance*, 48.

Infante, S., Kim, K., Silva, A. F., & Tetlow, R. J. (2022). The macroeconomic implications of CBDC: A review of the literature. Finance and Economics Discussion Series 2022-076. Washington: Board of Governors of the Federal Reserve System, <https://doi.org/10.17016/FEDS.2022.076>.

Kahn, C. M., & Rivadeneyra, F. (2020). *Security and convenience of a central bank digital currency* (No. 2020-21).

Kim, Y. S., & Kwon, O. (2019). Central bank digital currency and financial stability. *Bank of Korea WP*, 6.

Kshetri, N. (2023). China's digital yuan: Motivations of the Chinese government and potential global effects. *Journal of Contemporary China*, 32(139), 87-105.

<https://doi.org/10.1080/10670564.2022.2052441>.

Kshetri, N. (2023). China's digital yuan: Motivations of the Chinese government and potential global effects. *Journal of Contemporary China*, 32(139), 87-105.

<https://doi.org/10.1080/10670564.2022.2052441>.

Kshetri, N. (2023). China's digital yuan: Motivations of the Chinese government and potential global effects. *Journal of Contemporary China*, 32(139). <https://doi.org/10.1080/10670564.2022.2052441>.

Kuehnlenz, S., Orsi, B., & Kaltenbrunner, A. (2023). Central bank digital currencies and the international payment system: The demise of the US dollar?. *Research in International Business and Finance*, 64, 101834. <https://doi.org/10.1016/j.ribaf.2022.101834>.

Kumhof, M., & Noone, C. (2021). Central bank digital currencies—Design principles for financial stability. *Economic Analysis and Policy*, 71, 553-572; Allen, F., Gu, X., & Jagtiani, J. (2022). Fintech, cryptocurrencies, and CBDC: Financial structural transformation in China. *Journal of International Money and Finance*, 124, 102625.

Laband, J. (2022). Existential Threat or Digital Yawn: Evaluating China's Central Bank Digital Currency. *Harv. Int'l LJ*, 63, 515.

Laband, J. (2022). Existential Threat or Digital Yawn: Evaluating China's Central Bank Digital Currency. *Harv. Int'l LJ*, 63, 515.

- Li, S., & Huang, Y. (2021). The genesis, design and implications of China's central bank digital currency. *China Economic Journal*, 14(1), 67-77.
- Li, Z., Zhang, Y., Wang, Q., & Chen, S. (2022). Transactional Network Analysis and Money Laundering Behavior Identification of Central Bank Digital Currency of China. *Journal of Social Computing*, 3(3), 219-230.
- Liu, A. (2019). An Analysis of the PBOC's New Mobile Payment Regulation. *Cato J.*, 39, 87.
- Polyakova, A., & Meserole, C. (2019). Exporting digital authoritarianism: The Russian and Chinese models. *Policy Brief, Democracy and Disorder Series*, 1-22.
- Malloy, M., Martinez, F., Styczynski, M. F., & Thorp, A. (2022). Retail CBDC and US monetary policy implementation: A stylized balance sheet analysis.
- Mancini-Griffoli, T., Peria, M. S. M., Agur, I., Ari, A., Kiff, J., Popescu, A., & Rochon, C. (2018). Casting light on central bank digital currency. *IMF staff discussion note*, 8(18), 1-39, p. 30.
- Mansour, H. (2022). How successful countries are in promoting digital transactions during COVID-19. *Journal of Economic Studies*, 49(3), 435-452.
- Mersch Y. (2020). An ECB digital currency – a flight of fancy? Speech by Yves Mersch, Member of the Executive Board of the ECB and Vice-Chair of the Supervisory Board of the ECB, at the *Consensus 2020 virtual conference*, 11 May 2020.
- Michail, N., & Selvadurai, N. (2023). Towards an Effective Regulatory and Governance Framework for Central Bank Digital Currencies. *Stan. J. Blockchain L. & Pol'y*, 6, 189.

Müller, J., & Kerényi, Á. (2022). The Rise of Central Bank Digital Currencies. *Financial and Economic Review*, 21(3), 122-148.

Nabilou, H. (2020). Testing the waters of the Rubicon: the European Central Bank and central bank digital currencies. *Journal of Banking Regulation*, 21, 299-314.

Nabilou, H. (2020). Testing the waters of the Rubicon: the European Central Bank and central bank digital currencies. *Journal of Banking Regulation*, 21, 299-314.

Obiora, K. I. (2023). CHAPTER ONE: A PRIMER INTO THE BENEFITS, RISKS, LESSONS, AND PROSPECTS OF AFRICA'S FIRST CENTRAL BANK DIGITAL CURRENCY, THE eNAIRA. *OF DIGITAL CURRENCIES*, 3.

Otitoju, M. A., Dirisu, I. H., Ojokojo, P. P., & Abdul, F. (2023). Cashless policy and Naira redesign of the Central Bank of Nigeria (CBN): a review. *Journal of Global Economics and Business*, 4(14), 45-59.

Ozili, P. K. (2023a). Central bank digital currency research around the World: a review of literature. *Journal of Money Laundering Control*, 26(2), 215-226.

Ozili, P. K. (2023b). eNaira central bank digital currency (CBDC) for financial inclusion in Nigeria. In *Digital Economy, Energy and Sustainability: Opportunities and Challenges* (pp. 41-54). Cham: Springer International Publishing.

Ozili, P. K. (2023c). Using eNaira CBDC to solve economic problems in Nigeria. *Revolutionizing Financial Services and Markets Through FinTech and Blockchain, Forthcoming*.

Panetta, F. (2023), Letter from Fabio Panetta to several MEPs on the request to postpone the decision on digital euro. Retrieved from: https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov231006_Letter_from_Fabio_Panetta_to_several_MEPs_on_request_to_postpone_the_decision_on_the_digital_euro.en.pdf?ffba66151e533bfab912c2d52742263f, accessed on 18.10.2023.

Panetta, F. (2023). Shaping Europe's digital future: the path towards a digital euro. Introductory statement by Fabio Panetta, Member of the Executive Board of the ECB, at the Committee on Economic and Monetary Affairs of the European Parliament, Brussels, 4 September 2023. Retrieved from: <https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230904~8f5dff1e57.en.html>, accessed on 26.10.2023.

PBOC. (2021). Working Group on E-CNY Research and Development of the PBOC. Beijing, China: Progress of Research and Development of E-CNY in China.

Prates, M. (2021). "Legal troubles may delay CBDCs," February 24, 2021, in Official Monetary and Financial Institutions Forum. Retrieved from: <https://www.omfif.org/2021/02/legal-troubles-may-delay-cbdcs/>, accessed on 25.10.2023.

Pidano Paridon, P. (2021). “Legal Authority to Issue a US Central Bank Digital Currency,” Bank Policy Institute, 06.09.2021, retrieved 23.10.2023, Retrieved from: <https://bpi.com/legal-authority-to-issue-a-u-s-central-bank-digital-currency/>, accessed on 25.10.2023.

Pocher, N., & Zichichi, M. (2022, April). Towards CBDC-based machine-to-machine payments in consumer IoT. In *Proceedings of the 37th ACM/SIGAPP Symposium on Applied Computing* (pp. 308-315).

Pupolizio, I. (2022). From libra to diem. the pursuit of a global private currency. *Global Jurist*, 22(2), 281-306.

Quarles R., (2021). *Speech. Parachute Pants and Central Bank Money*. At the 113th Annual Utah Bankers Association Convention, Sun Valley, Idaho June 28, 2021, retrieved from: <https://www.federalreserve.gov/newsevents/speech/quarles20210628a.htm>, accessed on 20.10.2023.

Ree, J. (2021). Five observations on Nigeria’s central bank digital currency. *IMF Country Focus*, (16), 11.

Ree, J. (2023). *Nigeria’s eNaira, One Year After* (No. 2023/104). International Monetary Fund.

Rennie, E., & Steele, S. (2021). Privacy and emergency payments in a pandemic: How to think about privacy and a central bank digital currency. *Law, Technology and Humans*, 3(1), 6-17.

Samek, M., & Vlasta, M. (2021). Digital Yuan—Currency or Policy Tool?. *AUC IURIDICA*, 67(3), 111-127.

- Sethaput, V., & Innet, S. (2023). Blockchain application for central bank digital currencies (CBDC). *Cluster Computing*, p. 3.
- Soderberg, G., Bechara, M. M., Bossu, W., Che, M. N. X., Davidovic, S., Kiff, M. J., ... & Yoshinaga, A. (2022). Behind the scenes of central bank digital currency: Emerging trends, insights, and policy lessons.
- Soderberg, G., Bechara, M. M., Bossu, W., Che, M. N. X., Davidovic, S., Kiff, M. J., ... & Yoshinaga, A. (2022). Behind the scenes of central bank digital currency: Emerging trends, insights, and policy lessons.
- Srouji, J., & Torre, D. (2022). The Global Pandemic, Laboratory of the Cashless Economy?. *International Journal of Financial Studies*, 10(4), 109.
- Statista, (2023). Facebook: quarterly number of MAU (monthly active users) worldwide 2008-2022, Published by S. Dixon, Available at: <https://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/>, retrieved from 6.03.2023.
- Tan, B. (2022). Central bank digital currency and financial inclusion. *Available at SSRN 4307377*;
- Taskinsoy, J. (2021). Say Good Bye to Physical Cash and Welcome to Central Bank Digital Currency. *Available at SSRN 3972858*.
- Taskinsoy, J. (2023). The New Possible Trinity: Supranational Currency, Capital Mobility, and Monetary Independence, pp. 7-8. <http://dx.doi.org/10.2139/ssrn.4373812>.
- The Federal Reserve. (2022). Money and Payments: The U.S. Dollar in the Age of Digital Transformation. Retrieved from:

<https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf>, accessed on 20.10.2023.

The Federal Reserve. (2022). President Biden to Sign Executive Order on Ensuring Responsible Development of Digital Assets, retrieved from: <https://www.whitehouse.gov/briefing-room/statements-releases/2022/03/09/fact-sheet-president-biden-to-sign-executive-order-on-ensuring-responsible-innovation-in-digital-assets/>, accessed on 20.10.2023.

The White House. (2022). White House Releases First-Ever Comprehensive Framework for Responsible Development of Digital Assets. Retrieved from: <https://www.whitehouse.gov/briefing-room/statements-releases/2022/09/16/fact-sheet-white-house-releases-first-ever-comprehensive-framework-for-responsible-development-of-digital-assets/>, accessed on 20.10.2023.

The European Data Protection Supervisor (EDPS) (Leucci, S., editor). (2022). TechSonar Report 2022-2023. European Union, November 2022. Retrieved from: https://edps.europa.eu/system/files/2022-11/22-11-10_techsonar_report_22_23_en.pdf, accessed on 13.10.2023.

Tronnier, F., Biker, P., Baur, E., & Löbner, S. (2023, June). An Evaluation of Information Flows in Digital Euro Transactions Using Contextual Integrity Theory. In *Proceedings of the 2023 European Interdisciplinary Cybersecurity Conference* (pp. 7-12).

US Congress, House. (2021). Central Bank Digital Currency Study Act of 2021, HR 2211, 117th Congress, 1st Session, introduced in the House on

03/26/2021, retrieved from: <https://www.congress.gov/bill/117th-congress/house-bill/2211>, accessed on 26.10.2023.

US Congress. (2021). House, 21st Century Dollar Act, HR 3506, 117th Congress, 1st Session, introduced in the House on 5/25/2021, Retrieved from:

https://www.govtrack.us/congress/bills/117/hr3506#google_vignette, accessed on 26.10.2023.

US Congress. (2021). House, Ensuring American Global Leadership and Engagement Act, HR 3524, 117 Congress, 1st session, proposed in the House of Representatives on 25/05/2021, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117hr3524ih>, accessed on 26.10.2023.

US Congress. (2021). House, Countering Communist China Act, HR 4792, 117th Congress, 1st Session, introduced in the House on 7/29/2021, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117hr4792ih>, accessed on 26.10.2023.

US Congress. (2021). Senate, Deterring Communist Chinese Aggression against Taiwan through Financial Sanctions Act of 2022, S 3735, 117th Congress, 2nd Session, proposed in the Senate 2.3. 2022, retrieved from: <https://www.govinfo.gov/content/pkg/BILLS-117hr7704ih/html/BILLS-117hr7704ih.htm>, accessed on 26.10.2023.

US Congress. (2021). Senate, Venezuelan Democracy Act, S 5317, 117th Congress, 2nd Sess., proposed in the Senate 20/12/2022, retrieved from

https://www.foreign.senate.gov/imo/media/doc/12-20-22_risch_rubio_venezuela_bill.pdf, accessed on 26.10.2023.

US Congress. (2021). House, Digital Asset Market Structure and Investor Protection Act, HR 4741, 117th Congress, 1st Session, introduced in the House on 7/28/2021, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117hr4741ih>, accessed on 26.10.2023.

US Congress. (2022). House, To amend the Federal Reserve Act to prohibit the Federal reserve banks from offering certain products or services directly to an individual, and for other purposes, HR 6415, 117th Congress, 2nd Session, proposed in the House on 18 1/2022, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117hr6415ih>, accessed on 26.10.2023.

US Congress. (2022). Senate, A bill to amend the Federal Reserve Act to prohibit the Federal reserve banks from offering certain products or services directly to an individual, and for other purposes, S 3954, 117th Congress, 2nd session, proposed in the Senate 30/03/2022, retrieved from: <https://www.govinfo.gov/app/details/BILLS-117s3954is>, accessed on 26.10.2023.

US Congress. (2022). House, ECASH Act, HR 7231, 117th Congress, 2nd Session, introduced in the House on 03/28/2022, retrieved from: <https://www.congress.gov/117/bills/hr7231/BILLS-117hr7231ih.pdf>, accessed on 26.10.2023.

US Congress. (2022). Senate, No CBDC Act, S 4831, 117th Congress, 2nd Sess., proposed in the Senate on 9/13/2022, retrieved from: <https://www.lee.senate.gov/services/files/D9EE948C-BA22-40F7-ADDC-3CEB6AA9791D>, accessed on 26.10.2023.

US Congress. (2022). Senate, No Digital Dollar Act, S 4994, 117th Congress, 2nd Sess., proposed in the Senate on 9/28/2022, retrieved from: <https://www.govinfo.gov/content/pkg/BILLS-117s4994is/pdf/BILLS-117s4994is.pdf>, accessed on 26.10.2023.

US Congress. (2023). Senate, H.R. 556: 21st Century Dollar Act, 118th Congress, proposed in the Senate on 26/01/2023, retrieved from: <https://www.govtrack.us/congress/bills/118/hr556>, accessed on 26.10.2023.

Usher, A., Reshidi, E., Rivadeneyra, F., & Hendry, S. (2021). *The positive case for a CBDC* (No. 2021-11). Bank of Canada.

van der Linden, R. W., & Łasak, P. (2023). The Digitalization of Cross-Border Payment Systems and the Introduction of the CBDC. In *Financial Interdependence, Digitalization and Technological Rivalries: Perspectives on Future Cooperation and Integration in Sino-American Financial Systems* (pp. 75-92). Cham: Springer Nature Switzerland.

Van der Linden, T., & Shirazi, T. (2023). Markets in crypto-assets regulation: Does it provide legal certainty and increase adoption of crypto-assets?. *Financial Innovation*, 9(1), 22.

Waller, C. J. (2022). *The US Dollar and Central Bank Digital Currencies: At” Digital Currencies and National Security Tradeoffs,” a symposium presented by the*

Harvard National Security Journal, Cambridge, Massachusetts October 14th 2022 (No. 95814), Retrieved from: <https://www.federalreserve.gov/newsevents/speech/waller20221014a.htm>, accessed on 20.10.2023.

Wang, H., & Gao, S. (2023). The future of the international financial system: The emerging CBDC network and its impact on regulation. *Regulation & Governance*.

Wang, Y., Lucey, B. M., Vigne, S. A., & Yarovaya, L. (2022). The effects of central bank digital currencies news on financial markets. *Technological Forecasting and Social Change*, 180, 121715.

Wenker, K. (2022). Retail central bank digital currencies (CBDC), Disintermediation and financial privacy: The case of the Bahamian sand dollar. *FinTech*, 1(4), 345-361.

Wezel, T., & Ree, M. J. J. (2023). *Nigeria--Fostering Financial Inclusion through Digital Financial Services*. International Monetary Fund.

Xu, C., & Jin, B. (2022). Digital currency in China: pilot implementations, legal challenges and prospects. *Juridical Trib.*, 12.

Yang, J., & Zhou, G. (2022). A study on the influence mechanism of CBDC on monetary policy: An analysis based on e-CNY. *Plos one*, 17(7), e0268471.