Digital Euro:

Analysis and recommendations

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Contents

Introduction

The European Union is a political and economic area formed by 28-member states that are located on the European continent. The eurozone refers to the member states (19 of 28) that use the Euro as official currency.

Countries such as The Netherlands, France, Sweden, Belgium and the UK performed 50% of their payment transactions by a non-cash method[1]. Additionally, countries such as Sweden and South Africa have reduced their cash supply to respectively -6.9% and -3.7%[2]. At the same time, the retail e-commerce industry reached Trillion 1.915 USD dollars for 2016 expecting to achieve $4 trillion in 2020[3].

Central Banks are assessing the possibility to release Digital Currencies that could potentially substitute cash in the long run and satisfy the digital needs of the population. The idea of a 'cashless' society will allow the central bank to have absolute control of the money supply, which would also compete with Commercial Banks to generate deposits[4].

Central Banks create money in currencies, while Commercial Banks create money as deposits[5]. Central Bank money are banknotes in circulation and the reserves held by commercial banks at the central bank[6]. On the other hand, commercial banks create deposits as a result of granting loans. This process expands both sides of the Commercial Bank's balance sheet by the same amount[7].

The idea of a cashless society arose at the beginning of the 20th century with the "Chicago Plan". This initiative proposed a full reserve banking system where deposits are entirely backed by reserves, eliminating the current capacity of commercial banks to generate deposits.[8]

After the 2008 financial crisis, the full reserve banking system that was initially portrayed in The Chicago Plan was redefined as "Positive Money". A full reserve banking system promises economic stability by reducing the intensity of economic cycles (boom and depression), and it mitigates inflation and deflation. This view also presents an independent commission to control the total supply of money[9].

With the introduction and the sophisticated design of Digital Ledger Technologies (Blockchain), the objectives of the Chicago Plan have the potential to be met. Blockchain technology would enable anyone to open a deposit account directly at the Central Bank, without any intermediation needed and granting full control of the money output to the Central Bank.

However, the full reserve banking system does not consider the Inherent hierarchy of money: "What counts as money at one level of the hierarchy is credit for the institution above". The concept of hierarchy is that central bank money is better money than commercial bank money, even though they are accepted as equals [10] [11].

[1] Mastercard (2017) Measuring progress toward a cashless society retrieved from https://www.mastercardadvisors.com/content/dam/advisors/en-us/documents/MasterCardAdvisors-CashlessSociety.pdf
[2]. Wikipedia (2018) Cashless Society retrieved from https://en.wikipedia.org/wiki/Cashless_society
[3] eMarketer (2016) Worldwide Retail E-commerce Sales Will Reach $1.915 Trillion This Year retrieved from https://www.emarketer.com/Article/Worldwide-Retail-Ecommerce-Sales-Will-Reach-1915-Trillion-This-Year/1014369
[4] Kaminska (2014) The time for official e-money is NOW! Retrieved from https://ftalphaville.ft.com/2014/01/22/1748152/the-time-for-official-e-money-is-now/
[5] Mehrling (2017) Financialization and its discontents retrieved from http://financeandsociety.ed.ac.uk/ojs-images/financeandsociety/FS_EarlyView_Mehrling.html
[6] Jordan (2018) How money is created by the central bank and the banking system retrieved from https://www.snb.ch/en/mmr/speeches/id/ref_20180116_tjn/source/ref_20180116_tjn.en.pdf
[7] Mehrling (2016) "Great and Mighty Things which thou knowest not" retrieved from http://www.perrymehrling.com/2016/01/great-and-mighty-things-which-thou-knowest-not/
[8] Von der Becke & Sornette (2017) Should Banks Be Banned from Creating Money? An Analysis from Perspective of Hierarchical Money, Journal of Economic Issues 51:4, 1019-1032
[9] Ibid
[10] Mehrling (2015) Why is money difficult? Retrieved from http://www.perrymehrling.com/2015/06/why-is-money-difficult/
[11] Mehrling (2009) Natural Hierarchy of Money retrieved from http://www.perrymehrling.com/wp-content/uploads/2015/05/Lec-02-The-Natural-Hierarchy-of-Money.pdf

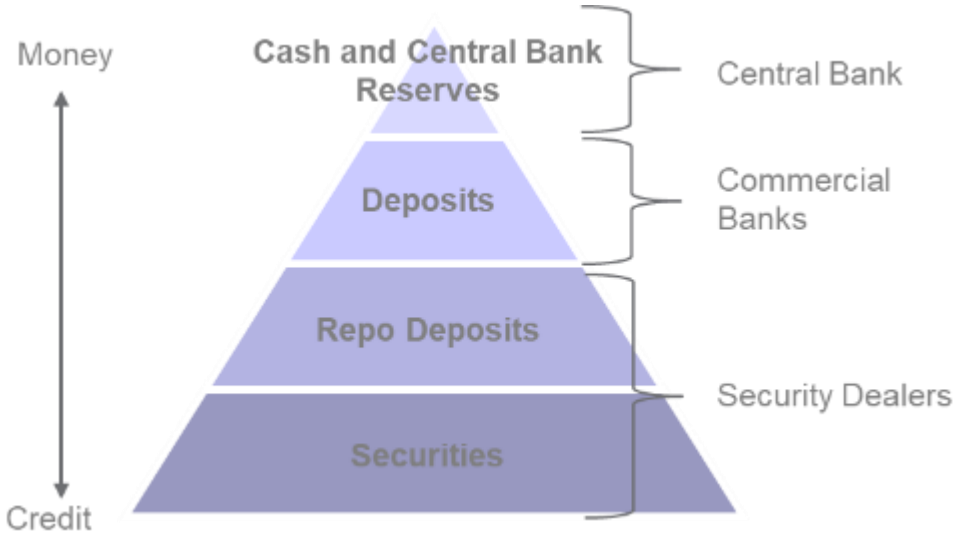

Figure 1.- Inherent hierarchy of Money

The pyramid of hierarchy expands and contracts depending on the needs of the system for money. The pyramid grows horizontally (it flattens) during economic growth and shrinks during a financial crisis. At the time of a crisis, consumers want to convert their deposits into currency.

The principle of hierarchical money gives the conclusion that even if Central Banks control a fixed amount of money in the economy, additional "cash" products will be developed expanding the overall quantity of money[12]. So, the Chicago Plan and the Positive Money views do not consider the fundamental role of money and credit creation that the economic system needs, which make both concepts inapplicable.

Central Banks need to create a Digital Cash strategy that takes into consideration the hierarchy of money and other fundamental macroeconomic principles that can improve the flow of funds between consumers.

Benefits and Concerns

The Central Bank would consider issuing digital cash because of the following advantages[13]:

- Interest rate manipulation: Negative interest rates could quickly pressure holders of electronic funds.
- Reduction of Financial Crime: Money flows for illegal activities can be controlled.
- Decrease tax evasion: The Central Bank can share information with local authorities and expose tax cheats.

Additionally, The Bank of England elaborated a report that points out additional benefits of the adoption of a Central-Bank Digital Currency (CBDC)[14]:

- Monetary policies: Provide transparency and limit the money creation capacity of commercial banking.
- Available and universal: It can be utilised 24/7 by banks, firms and households.
- Electronic and resilience: CBDC will use a Digital Ledger Technology (Blockchain).
- Interest-bearing: Can be used as a tool of countercyclical monetary policy.
- Increase GDP: The BoE expects that a digital cash issuance of 30% of GDP, against government bonds, could permanently raise GDP by as much as 3% annually.

[12] Von der Becke & Sornette (2017)
[13] Rogoff (2016) The Sinister Side of Cash retrieved from https://www.wsj.com/articles/the-sinister-side-of-cash-1472137692
[14] Barrdear & Kumhof (2016) The macroeconomics of central bank issued digital currencies retrieved from https://www.bankofengland.co.uk/working-paper/2016/the-macroeconomics-of-central-bank-issued-digital-currencies

Except for benefits, risks also need to be taken into consideration, such as allowing privacy and control of the full introduction of digital cash into the economy.

Some relevant arguments are:

- Digital Cash is not current: The digital currency would eliminate the immediate convertibility offered by cash[15].
- Abusive power of the state: By forcing consumers to use an electronic means of payment, the government would gain the ability to monitor and manipulate every aspect of the consumer's finances[16].
- Detrimental Interest policies: The adoption of electronic cash would empower central banks to enforce harmful interest rates policies, harming pensions and savings[17].
- Financial exclusion: The Central Bank could deprive "non-wanted" groups of receiving resources, for example, illegal immigration[6].

As it was mention previously, any Central Bank would have benefits in issuing digital cash however it can also harm consumer's freedom.

Digital Cash Attributes

Back in January 2017, Yves Mersch (Member of the Executive Board of the ECB) commented about the possibilities to implement Digital Cash or Digital Base Money (DBM)[18] in the Eurozone.

During the report, two different characteristics of DBM's creation were mentioned:

- Account-based DBM: The ECB would open an account in the form of commercial bank deposits for every interested non-bank participant. The central bank is directly involved in a DBM transaction as it registers the transfer.

- Value-based DBM: In this case, interested consumers (non-banks) need electronic wallets for holding and using DBM. A transfer of DBM required the funds to be debited from the payer's electronic wallet and credited to the payee's device without the involvement of the central bank.

Characteristics	Cash	Value – Base Digital Base Money	Register – Base Digital Base Money	Bank Deposits
Credit Risk	No	No	No	Yes
Payment in real time	Yes	Yes	Yes	No
Offline function	Yes	Yes	No	No
Anonymous payments	Yes	Yes	No	No
Physical presence required	Yes	Yes, for card not for the app	No	No
Usability	Face to face	Smartphone or card reader	Via apps or online	Via apps or online
Interest rate manipulation	No	Yes	Yes	Yes, for saving accounts above 10 k
Increase the power of Central Banks	No	No	Yes	No
Access to Central Bank Balance Sheet	No	Yes	Yes	No
Technology	None	DLT (Blockchain)	DLT (Blockchain)	Commercial Bank's Infrastructure

Table 1.- Comparison between payment methods[19]

[15] Elaine Ou (2016) The Cashless Society Is a Creepy Fantasy retrieved from https://www.bloomberg.com/view/articles/2016-10-14/the-cashless-society-is-a-creepy-fantasy
[16] Folks (2016) The Sinister Side of a Cashless Society retrieved from https://www.americanthinker.com/articles/2016/08/the_sinister_side_of_a_cashless_society.html
[17] Staff (2016) Negative Interest Rates – Won't You Take Me To Funkytown? Retrieved from http://www.valuewalk.com/2016/02/negative-interest-rates-wont-you-take-me-to-funkytown/?all=1
[18] ECB (2017) Digital Base Money: an assessment from the ECB's perspective retrieved from https://www.ecb.europa.eu/press/key/date/2017/html/sp170116.en.html
[19] Riksbank (2017) E-Krona properties compared to cash and commercial bank money retrieved from http://jpkoning.blogspot.nl/2017/12/electronic-money-will-only-save-central.html

The Register DBM resembles more of a bank deposit and less of a paper base cash. Additionally, the Register DBM provides the capability to track and collect information from the transaction to the ECB, which would harm the privacy of consumers.

However, the Value DBM can be viewed as cash because it is offline and anonymous. However, it can be subject to the interest rate manipulation such as detrimental interest rate policies.

Additionally, the ECB raises three questions that function as conditions for implementation:

- Options for providing DBM to population
    - A straightforward approach. - Allow non-banks to convert commercial bank deposits into DBM at a rate of 1 to 1. This policy will cause a commercial bank to run-out in times of crisis.
    - A restrictive approach. - The central bank will exchange DBM for assets (asset purchase). This policy could generate a secondary market for DBM, limiting transparency of the currency.
- Remuneration for adopting DBM
    - Fixed interest rate. - The ECB will pay a 0% interest rate for all deposits in DBM, without considering the economic conditions of the eurozone.
    - Fluctuating interest rate. - The ECB will pay the actual interest rate for all deposits in DBM. For example, the holders of DBM in 2017 will receive an interest rate of -0.4% for their savings.
- Technology
    - The ECB sees the Digital Ledger Technology as a possible application to support the DBM.

The Bank of England (BoE) has also analysed the possibility to release Digital Cash called Central-Bank-Issued Digital Currencies (CBDC). The BoE established the CBDC as a universal, electronic, 24x7, national/interest-bearing currency with access to BoE's balance sheet. The vision of the BoE is to construct a system where most of the transactions continue as deposits with Commercial Banks being the CBDC, a complementary mean of settlement.[20].

The BoE considers an initial release of CBDC of 30% of GDP against an equal amount of government debt. The decision to limit the emission to 30% is because this amount is comparable with the quantitative easing (QE) conducted by various central banks over the last decade[21].

The initiative of the BoE proposes the application of Digital Ledger Technology (Blockchain) as the technology to support the operation of the CBDC. However, a technical plan for implementation is not ready yet.

On the other hand, Sweden Central Bank (SCB) proposed a moderate scope where the Digital Cash (also called e-krona) is only meant for small payments, and therefore it does not substitute cash, but the digital currency complements current payment methods. As a starting point, the SCB does not expect to create some new monetary policies[22].

Moreover, the SCB has already started a three-year project to evaluate the release of the e-krona. The first phase (2017) aimed to develop a concrete theoretical proposal for e-krona. In the second phase (2018) the regulation/operational/technological viability will be assessed. If the assessment turns affirmative, the implementation is set to be planned for 2019. This plan serves as the benchmark on how the EU can follow the same methodology[23].

[20] Bank of England (2016) The macroeconomics of central bank issued digital currencies retrieved from https://www.bankofengland.co.uk/working-paper/2016/the-macroeconomics-of-central-bank-issued-digital-currencies
[21] Barrdear & Kumhof (2016)
[22] Riksbankens (2017) e-krona project plan retrieved from http://docplayer.net/64668414-Riksbankens-e-krona-14-march-17-project-plan-phase-1.html
[23] Ibid

Recommendations

The digital cash must complement the current payment methods and must not become the "unique" source of currency in a country. The three examples that have been analysed in this paper (EU, BoE and SCB) follow the desired paradigm.

The ECB will neglect the intrinsic tendency for money/credit to expand and contract if the ideas portrayed by the Chicago Plan are adopted[24]. A useful digital cash policy needs to consider the credit nature of money and its natural hierarchy.

Moreover, Digital Cash must be a Value-Based Currency, allowing secure money transfers between parties and preventing privacy restrictions for consumers. Finally, the ECB should evaluate the possibility to set a rate of 0% for the deposits held on Digital Cash; this will avoid speculative practices from other participants in the system.

Based on the analysis performed, the e-krona has more cash characteristics.

Policy element / Central Bank	European Central Bank	Bank of England	Sweden Central Bank
Name given	Digital Base Money (DBM)	Central-Bank Digital Currency (CBDC)	e-krona
Digital cash as part of Monetary Policy	Yes	Yes	No
Initial offering	Not detailed	30% of GDP	Not detailed
Implementation plan 2017	No	No	Yes
Technology	Blockchain	Blockchain	Blockchain
Privacy of currency (Value/Register Base)	Not defined	Not defined	Value base
Scope	A complement of cash and bank deposits	A complement of cash and bank deposits	A complement of cash and bank deposits

Table 2.- Comparison Central Bank approaches towards Digital Cash

The three cases that have been analysed all show that the Blockchain technology would be the best infrastructure to support Digital Cash.

However, the big challenge is the development of an attractive front-end application that guarantees a smooth customer experience. In this regard, Central Banks do not have any expertise and almost inevitably lag to Commercial Banks[25].

The ideal scenario is that the ECB could develop both the blockchain application and the Front-End in an open innovation scheme, making a partnership with FinTech's and technology companies.

The implementation phase should follow the e-krona project plan guidelines. For example, the SCB will take 2018 to run trials and to assess the viability of the digital cash. Once that SCB decides to proceed with the initiative the implementation phase could start.

The implementation phase will require more effort from countries that still rely on cash for their daily transactions, such as Poland, Italy, Germany and Spain. The ECB must maintain the present methods of payments and release a policy concerning 1-to-1 1 exchange to encourage the overall conversion.

[24] Von der Becke & Sornette (2017)
[25] Reddell (2017) Central bank e-cash retrieved from https://croakingcassandra.com/2017/12/14/central-bank-e-cash/

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- Strategic analysis and roadmap development
- Design of infrastructure and risk controls to support digital transformation
- Changes with operating models
- Assisting with developing an API plan and strategy which includes assistance with technology selection and implementation

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- An assessment of the potential benefits and costs of the digital transformation roadmap
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- Recommendations on a preferred course of action
- Description of the implementation approach

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Next steps

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