**Chapter 8**

 **A digital Euro:**

 **On CBDC and monetary policy[[1]](#footnote-1)**

1. **Introduction**

Before coming to the ECB’s digital euro Report, published three weeks ago and the impact of CBDC upon the effectiveness of monetary policy, my main theme in today’s Speech, one general remark on the state of play of a central bank digital currency (CBDC). Clearly Asia Pacific in this frontier is ahead of western economies with China being the real front runner. With a superior digital infrastructure that facilitates and promotes a digital payments culture in the region, it’s not a surprise that local central banks take the lead in developing and implementing either a retail CBDC (see e.g. PBoC’s e-CNY -- also known as Digital Currency Electronic Payment-- test in 4 big cities) or a wholesale one (see attempts by central banks in Singapore, Thailand, and other SE Asian countries like Malaysia, Philippines, etc. but also in Japan and South Korea).

What we are witnessing here is a double race for central banks. The first is one between the official sector versus the private sector: central banks caught themselves to be defensive vis-à-vis the private sector’s recent initiatives on the payment systems field (more and more people switch to payment platforms offered by big tech firms like Facebook, Amazon, Tencent, Alipay, etc.) but also on their (premature) plans to issue a private digital currency (Libra, etc.). For central banks such private initiatives are near to an existential threat, and the coronavirus pandemic, forcing more people το shop online using mobile phones etc. has only added to the urgency. A retail CBDC could stem the growth of crypto assets (eg. bitcoin) and stable coins (eg. Libra, JP Morgan coin) which pose numerous risks, including risks to AML, consumer protection, high volatility and liquidity risk. Central banks, instinctively, are responding to the above private sector challenges by designing their own digital payment networks in order to retain control of their own monetary systems, forbidding at the same time any efforts to issue private digital currencies. It’s a question, ultimately, of monetary and payments sovereignty. As a legal tender, digital currencies should and must be issued by central banks, end of story! Sovereign money is the winner in this race, have no doubt about that since the stakes are high! Having said that, it is an open issue if national authorities (monetary and/or governments) do something – in either direction, to promote or halt—about a big tech company’s dominance in global digital payments.

The second race is among central banks with regards to the issuance of CBDC and is equally serious and with many facets. A few central banks may well be thinking about the issuance of CBDC —especially if they move first— as an attempt towards enhancing the status of their currency as an international reserve currency (i.e. increasing its share in global trade, FX global reserves basket and so on). If others go ahead with CBDC, it will be a strategic mistake to be left behind—it’s, in other words, a reputational matter too. Ultimately it’s a power game that may evolve into a new form of global currency war, what Stanford historian Niall Ferguson called “the new cold war”, with US and China as the two main rivals this time. What is at stake here is US dollar hegemony as a global reserve currency. Of course, during the last decades, the international monetary system has lived with many types of traditional currency wars, of the type of *competitive devaluations.* Even these days with a global liquidity trap, with too low interest rates that weaken national currencies and the pandemic testing the limits of globalization, a number of analysts worry about an escalation of beggar-thy-neighbor exchange rate policies.

However, the new global currency war we are talking about will be - in the near future, if not already under way - more subtle, agile and perhaps assertive. The most serious implication of moving away from the existing dollar-based international payments system (with its traditional clearing and settlement pathways) to a new digital infrastructure -- with certain advantages to those “moving first” with the issuance of a CBDC – where there will be no need for electronic transactions to go through the existing international banking system for clearing and settlement. In that not so hypothetical scenario, US dollar dominance will be diminishing with serious long-term repercussions in terms of its status as the world’s only serious reserve currency. How likely is this scenario in the foreseeable future? Well, nothing is permanent, the “only permanent thing is change” according to the ancient Greeks. Clearly, US dollar global dominance will be at threat if it loses ground in the digital payments race, including CBDC.

1. **A few remarks on the ECB’s “Report on a digital euro”**

The Report examines the issuance of CBDC from the Euro system perspective:

* The term digital euro denotes a liability of the Euro system recorded in a digital form as a complement to cash and central bank deposits.
* A digital euro would be just another way to supply euro, not a parallel currency, by definition risk-free central bank money, widely accessible on equal terms to users in all euro area countries, fully trusted just like any other form of euro.

The Report is rather thin on monetary policy implications of a digital euro and this is, I believe, deliberate (the ECB may want to buy time, no rush, there are other urgencies right now like the pandemic, the risk of deflation, the Strategic Review). As it states “this could emerge in the future on the basis of further analysis”— this is what I will be doing in the second part of this webinar, so stay tuned!

The Report does not advocate a specific type of digital euro, ignoring also issues like running costs, setting-up, etc.

The main grounds that justify the issuance of a digital euro are under a set of seven plausible real-world scenarios and implied requirements.

Related to the core central bank functions (1 – 5 below):

*Scenario 1: the digitalization and independence of the European economy can benefit from a digital form of central bank money available to citizens.*

This requires enhanced digital efficiency. I explain: the digital euro should keep pace with state-of-the-art technology at all times in order to best address the needs of the market as regards usability, convenience, speed, cost efficiency and programmability.

*Scenario 2: the role of cash as a means of payment declines significantly.*

This requires cash-like features. A digital euro aiming to tackle a decline in the acceptance of cash should permit offline payments. Moreover, it should be easy for vulnerable groups to use, free of charge for basic use by payers, should have a strong European branding and should protect privacy.

*Scenario 3: a form of money other than euro-denominated as central bank money, commercial bank deposits or electronic money becomes a credible alternative as a medium of exchange and, potentially, as a store of value in the euro area*.

This requires competitive features. The digital euro should offer the basis for providing
functionalities that are at least as attractive as those of the payment solutions available
in foreign currencies or through unregulated entities.

*Scenario 4: if the Euro system were to conclude in the future that the issuance of a digital euro is necessary or beneficial from a monetary policy perspective.*

This requires monetary policy option. If considered to be a tool for improving the transmission of monetary policy, the digital euro should be remunerated at interest rate(s) that the central bank can modify over time.

*Scenario 5: there is a need to mitigate the probability that a cyber incident, natural disaster, pandemic or other extreme events could hinder the provision of payment services.*

This requires back-up system. In order to improve the overall resilience of the payment system, the digital euro should be widely available and transacted via resilient channels that are separate from those of other payment services and can withstand extreme events.

Related to the broader objectives of the EU (article 127 of the TFEU):

*Scenario 6: the international role of the euro gains relevance as a Eurosystem objective.*

This requires international use.The digital euro should be potentially accessible outside the euro area in a way that is consistent with the objectives of the Eurosystem and convenient to non-euro area residents.

*Scenario 7: the Euro system decides to proactively support improvements in the overall costs and ecological footprint of the monetary and payment systems.*

This requires cost saving and environmental sensitivity. The design of the digital euro should achieve a reduction in the cost of the current payments ecosystem, based on technological solutions that minimize its ecological footprint.

The digital euro should meet the following seven prerequisites irrespective of which specific future scenario materializes. Seven real-world scenarios, seven prerequisites:

* Ability to control the amount in circulation. The digital euro should be an attractive means of payment, but should be designed so as to avoid its use as a form of investment and the associated risk of large shifts from private money (for example bank deposits) to digital euro.
* Understand the impact on the profitability and risk-taking of the central bank. In addition, the Euro system might prevent to be exposed to financial liabilities as an operator of a retail payment system.
* The digital euro should then be made available on an equal basis in all euro countries through supervised intermediaries, which could leverage their existing customer-facing services and avoid the costly duplication of processes.
* Although central bank liabilities are not subject to regulation and oversight, in issuing the digital euro the Euro system should still aim at complying with regulatory standards, including in the area of payments (perhaps because it won’t be the only game in town!)
* It should be made available through standardized front-end solutions throughout
the entire euro area and be interoperable with private payment solutions.
It should be easily accessible by anyone, including citizens who currently do not participate in the financial system, and easy to use. The digital euro would need to co-exist with cash.
* The design should include specific conditions for access and use by non-euro area
residents to ensure that it does not contribute to excessively volatile capital flows or
exchange rates.
* Digital euro services will need to be highly resilient to cyber threats and capable of providing a high level of protection to the financial ecosystem from cyber-attacks. In the event of successful attacks, the recovery time should be short and the integrity of the data protected.

The ECB High Level Task Force on CBDC will carry on work, and towards mid-2021 the Euro system will decide whether and when to launch a digital euro.

1. **CBDC and the effectiveness of monetary policy**

Τhe introduction of CBDC could change the framework in which central banks conduct monetary policy, affecting both the implementation and transmission of monetary policy.

CBDC represents a new type of central bank money whose demand – like cash – would need to be accommodated. CBDC would substitute other payment methods supported by banking deposits with ultimate effects on the money supply since it may influence the monetary base (depending on the degree of substitution between deposits and traditional currency, the selected design and the amount of CBDC issued) and/or the money multiplier. For instance, due to the existing fractional reserve banking system, the impact on the money multiplier may be triggered from, say, a switch from excess reserves to CBDC.

Moreover, CBDC could have potentially serious implications for the traditional business model of commercial banks. This is so because if lending were to take place increasingly outside the traditional banking system, the role that traditional commercial banks play in the standard money multiplier process, by which changes in open market operations and the quantity of reserves directly affect the amount of lending in an economy, could be severely diminished and bank’s profitability too. This may in turn hamper central banks’ ability to control liquidity in the economy through standard monetary policy operations.

More generally, a CBDC could be seen as a productivity shock in the financial system, with a deflationary impact, altering the informational content of monetary aggregates, changing the velocity of circulation and eventually the stability of the money/inflation relationship. The relevant literature investigates the impact of CBDC – through the existing four different channels of monetary policy transmission, interest rate, asset prices, credit and exchange rate channel - over the term structure of interest rates including the effective lower bound, QE efficiency and money market rates.

*Interest rate channel*

If CBDCs are interest-bearing and can be held without limits, this could affect holdings by institutional investors of other liquid, low-risk instruments (such as short-term government bills and repos backed by sovereign collateral). An interest-bearing CBDC could make monetary policy more effective as the pass-through of interest rate changes by the CB would be more direct and even addressing the zero lower bound (or the even lower, effective bound) on interest rates. On the other hand, if CBDC offers a direct alternative for deposits, banks would have less ability to independently set deposit interest rates. Last but not least, the CBDC interest rate would help to establish a hard floor under money market rates.

However, the overall effects of CBDC on the term structure of interest rates are very hard to predict and will depend on many factors. To attract demand, short-term government paper and overnight repos with treasury collateral would likely need to provide some yield pickup compared to CBDC. This would lead to the short end of the sovereign yield curve being above the CBDC rate.

In case of an unremunerated CBDC (non‑interest bearing) like banknotes, this would not directly transmit changes in the key interest rate to holders, nor would it be likely to have large effects on money market interest rates. But an unremunerated CBDC could still have important implications for monetary policy. In particular, it could reinforce the lower bound on interest rates. The lower bound exists because if interest rates fell significantly below zero, depositors could withdraw and hold banknotes. But doing so comes with some costs, particularly for large amounts, because banknotes must be stored securely and cannot be used for payments that are not face‑to‑face. This makes the effective return on cash holdings slightly negative and has enabled some central banks to set policy rates below the zero rate paid on cash. CBDC would probably have negligible storage costs, making it easier to hold unremunerated CBDC when other interest rates drop below zero. Digital fiat can be programmed and people would have fewer fallbacks and central banks more flexibility.

*Asset prices channel - QE efficiency*

A universally accessible CBDC could lead to a more efficient way to administer quantitative easing (QE) programs, with the additional liquidity to be distributed directly to the economy. With an accessible CBDC that could be used by consumers and businesses, the central bank could transfer units of CBDCs to the non-banks while leaving the balance sheet of the banking sector unchanged, thus countering banks’ dampening of transmission (Meaning, 2018). CBDC could also facilitate “helicopter drops” of money that could be used to stimulate aggregate demand.

Beyond that, as a liquid and creditworthy asset and widely tradeable, CBDC would be attractive to institutional investors that would be akin to interest-bearing central bank reserves or reverse repo facilities, yet could function as a safe asset comparable in nature to short maturity government bills. CBDC attracting significant demand as an asset to hold may also change the structure and functioning of funding markets, affecting banks and corporations. Issuers of money market instruments and borrowers in repo markets would see more competition because a CBDC would substitute for such claims.

*Credit channel*

In case of a remunerated CBDC, i.e. pay interest on CBDC balances, banks would have less scope for independently setting the interest rate on retail deposits. The rate paid on a remunerated CBDC would set the lower limit of the return households and businesses were prepared to accept on their money holdings. This may imply that as the rate paid on CBDC varied, banks might adjust the deposit rates offered to households and companies to avoid a change in the relative attractiveness of CBDC to deposits. Ultimately, the impact would depend on the relative changes to interest rates on both saving and borrowing. At the end, a downside risk emerges with regards to disintermediation of the banking system by increasing the incentive for households and businesses to shift larger amounts of money into CBDC, especially if there is extension of a deposit guarantee to CBDCs from the central bank. This shrinking of the banking sector’s balance sheet, known as ‘disintermediation’, would result in a lower total volume of funding for banks. Banks would need to consider how to react to a prospective loss of deposit funding, and the impact it would have on their ability to provide lending to the wider economy. They could react by paying a higher interest rate on deposits in order to limit any further outflows to CBDC or they could seek to replace lost deposit funding with alternatives, such as longer‑term deposits or wholesale funding. But both of these options may raise their overall cost of funding, which — if banks seek to maintain their profit margins — could prompt banks to increase the cost of the credit they provide to the economy. In turn, that could result in a lower volume of lending by banks, all else being equal. It could also reduce the seigniorage revenue collected by a central bank if this new form of digital money replaced existing cash. Seigniorage revenue could be higher if the rate on the retail CBDC was lower than the rate on the corresponding assets on the central bank balance sheet, and/or if the cost of maintaining the retail CBDC was lower than the cost of maintaining banknotes, as is likely to be the case.

However, competition to deposit funding could be remedied and bank disintermediation could be preventable by using unattractive and even negative interest rates on a CBDC. Panetta (2018) and Bindseil (2020) both suggest a two-tier remuneration framework to alleviate the problem of financial disintermediation. Whereby, the central bank sets a threshold on CBDC holdings, above which a less attractive and potentially negative interest rate is applied. Having a two-tiered system would bear some advantages over the one tier. First, the tiered system distances the central bank from popular criticisms e.g. of financial repression and expropriation of money holders. In this way, the CBDC can be deconstructed into two functions, first the medium of exchange mechanism circulates as tier 1 CBDC, while the store of value function would be assigned to tier two, and can be managed by the application of an unattractive interest rate.

*Exchange rate channel*

Looking now to CBDC’s potential impact on the exchange rate channel, if CBDCs were introduced by jurisdictions with international currencies, they could reinforce existing costs and benefits, including externalities. Similarly, CBDC could change the nature of global liquidity and safe asset provision. Also, and especially if introduced prematurely, CBDC could, in some situations, lead to large capital movements and related exchange rate and other asset price effects. In addition, countries might face challenges in preparing for what would happen if other central banks were to introduce CBDC. The cross-border and global dimensions of CBDCs available to non-residents could be especially pronounced during times of generalized flight to safety. Under such conditions, exchanging a CBDC for an international currency could potentially enable faster deleveraging in capital markets. If CBDCs accelerated flights from risk, deleveraging pressures could manifest themselves in the form of tight funding conditions and sharp movements in foreign exchange markets. As a result, central banks that have introduced or are seeking to introduce a CBDC should consider cross-border issues such as large capital movements and related exchange rate and other asset price effects (quite relevant here is also the introductory point on the potential of a global currency war).

In sum, the consequences of CBDC issuance for the implementation and transmission of monetary policy are directly related to how a CBDC is designed and how wide the access to a CBDC is. It could also raise questions about access to credit facilities of new counterparties to the central bank, e.g. from the fintech sector (under terms that would need to be determined, etc.) In addition, as we argued above, a digital fiat could change the composition and the size of a central bank’s balance sheet and would therefore affect its profitability and risk exposure.

Here is the Professor’s verdict on CBDC:

Q1. How big a challenge is the introduction of a CBDC?

Q2. How much will the way we think and conduct monetary policy be affected?

On the first question, have no doubt, it’s going to be an important structural change in the payment system and monetary fields, global liquidity and capital markets. If now it develops to a regime switch, a game changer, remains to be seen.

On the second question, CBDC’s parallel impact on the payment systems, FX global reserves and liquidity would force policy makers to a more holistic approach to monetary policy, to move, if you like, from a “partial equilibrium” analysis to a general equilibrium analysis, making so the challenge for them a more demanding one. One thing is certain: there will be no “one-size-fits-all” CBDC. As introducing a CBDC may bring new risks to monetary policy and new financial liabilities including cyber-security issues as an operator ultimately of a retail payment system, all these require careful assessment and consideration, taking into account that new innovations do not lead always to superior outcomes.

1. **Financial stability implications**

We now come to the implications related to financial stability, starting with the consequences for the banking sector.

 *Consequences for banks*

1. *Bank profitability*

Bank profitability may suffer as funding costs squeeze net interest margins and the supply of loans contracts. For banks to keep attracting deposits, the interest rate they pay must rise until households are indifferent between holding bank deposits and a CBDC, putting pressure on interest margins. Banks may opt to absorb this cost, but it is likely to be followed by an increase in the rate on loans. At this new, higher interest rate, however, fewer projects would generate enough income to obtain funding (Keister, 2019). This has a two-fold effect, first the demand for loans is likely to shrink at the higher interest rate, reducing the marginal volume of loans that generate income. Moreover, existing loans made at variable rates and new loans will be more difficult for borrowers to service. Thus, exposing banks to more credit risk, compounding the negative impact on profitability and eventually leading to the erosion of capital buffers, threatening solvency and financial stability. Increase in the proportion of risky loans made and decline in profitability can also lead to the tightening of capital requirement constraints that further amplify the contraction of bank credit (Bianchi, 2014).

Moreover, the magnitude of the impact CBDC may have on deposit rates may be sensitive to the current interest rate level. Introducing a CBDC in a low interest rate environment could make deposits more prone to substitution whereas in a high interest rate environment, the CBDC appears less attractive to households(assuming that it does not offer a rate of interest that is threatening to bank funding). Banks are also heterogeneous in the way they comprise their mix of funding. Deposit-intensive banks are more likely to be susceptible to the negative consequences of increased funding costs through deposits.

*2. Bank runs*

A CBDC may accelerate bank runs as the run is no longer a race between depositors to bank branches to withdraw cash, but rather a game of “fastest-finger-first” to move money into CBDC wallets/accounts. An oft-cited risk to introducing CBDC is the risk of a bank run as depositors would easily be able to transfer bank deposits to the CB. Under a stress scenario, CBDC would represent a risk-free option which would be available faster and with less friction than redeeming money as cash sums. The stability of retail funding could weaken, despite deposit insurance, when a CBDC provides an extremely safe substitute.

*3. Shadow banking*

Uncertainty with respect to the banking sector could increase firm’s reliance on alternative market-based financing sources, potentially increasing the size of the shadow bank sector. CBDC could lead to shrinkage in credit from the banking sector and alternative forms of financing could be used to fill this void. The proliferation of ‘shadow banking’ could bring about concerns for regulators as shadow banking is often considered to be more fragile than traditional banking due to a lack of public sector guarantees, strong interconnectedness, liquidity and maturity mismatches, significant leverage and frailties to funding shocks (Claessens, 2012). However, this depends on the forms of non-bank financial intermediation, as other evidence suggest that systems with high levels of markets and market-based intermediation are often more resilient. (Bats, 2017).

 ***Consequences for non-bank financial intermediaries***

Looking to the consequences for non-bank financial intermediaries, the impact is less clear, and may depend on the level of substitutability of cash-like products in terms of liquidity and trust. In this respect, CBDCs could compete with money market funds, particularly in a very low rate environment, such that money market fund customers would not be sufficiently remunerated for liquidity and modest credit risk, and would prefer the certainty of a CBDC product. If this were to occur, it could have an implication on government, bank and even corporate funding markets at the short end of the curve.

By contrast, other non-bank intermediaries are not likely to be directly impacted but face indirect consequences. In particular, a potential shortage of supply in the loan market from banks provides opportunity for alternative lenders. While the focus tends to remain on the disintermediation of banks, non-bank financial intermediaries could also be impacted by CBDC. The non-bank financial intermediation system is the network of financial intermediaries that conduct maturity, credit, and liquidity transformation without being subject to banking regulation and do not have formal access to central bank liquidity or public sector credit guarantees (FSB, 2013). Financial institutions that comprise the non-bank system consist of money market funds (MMFs), structured finance vehicles, broker-dealers, finance companies and financial holding companies. As non-bank financial intermediaries have also shown to be highly connected and fragile during times of economic stress, a CBDC could increase the fragility of retail orientated funds. For example, MMFs are typically used by investors looking to get a better rate than the deposits or savings rates offered by banks. If investors perceive the fund to be failing, they could be triggered to withdraw liquidity quickly in response to asset price shocks. Typically, investors might try to get their capital out and back into bank deposits. However, in the age of a CBDC, investors may look to move capital into ultra-safe assets by passing short-term financial products straight into CBDC.

1. Keynote speech at the digital monetary Institute, held in Singapore on 10th November 2020, moderated by Adam Cotter. [↑](#footnote-ref-1)