Balancing public-private partnerships in a digital age: CBDCs, central banks and technology firms

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ABSTRACT

What roles exist for public and private partnerships within the context of central bank digital currencies (CBDCs), in an increasingly digitalized global system? Do central bank digital currencies (CBDCs) serve as public goods rather than tools which should primarily remain within the realm and governance of private sector firms? What challenges or risks are presented through the use of CBDCs and how can such risks be mitigated through current existing structures - as well as models which have been propounded in relation to public – private partnerships? This paper aims to contribute to the literature on the topic through a consideration of several variants and models of CBDCs under which the public private partnership would function, namely the synthetic CBDC (sCBDC) and the two-tiered CBDC. Further, two other types of CBDCs, namely the wholesale CBDC and the retail CBDC will be distinguished - as well as the account based CBDC, which is contrasted to CBDCs based on digital tokens. Whilst concerns for privacy and security remain paramount and cannot be undermined, particularly from the perspectives of distributed ledger technologies (and blockchains – through which such platforms operate), such concerns need to be weighed against the need for identification since regulators will be better supported in their goals in enforcing the law, as well as identifying fraudulent operations, where sufficient identification procedures have been put in place.

Key words: CBDCs, synthetic CBDCs, two tiered CBDCs, retail CBDC, distributed ledger technologies, regulation, governance, anti trust , competition, financial stability

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Balancing Public-Private Partnerships in a Digital Age: CBDCs, Central Banks and Technology Firms

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Introduction

In accentuating the importance of public-private partnerships, Adrian (2020), draws attention to the need for a shift in focus to market design and contestability, firm entry and exit, anti trust, and business model viability. Further he adds, that the goal of such public-private partnership is to preserve comparative advantages – the private sector's role and the need to interface with customers and innovate, as well as the public sector's need to regulate, supervise and ultimately, provide trust.

In drawing comparisons between the two models of CBDCs under which the public-private partnership would function, Adrian (2020:2) reiterates that the synthetic CBDC and the two tiered CBDC would differ based on where the boundary is set between the public and private sectors. The commonality between both models being adjudged as their consensus on the need for customer interaction, as well as customer due diligence, wallet design and currency distribution being governed by the private sector, and the control by the central bank, in matters of regulation and supervision, is furthermore, highlighted.

However in matters relating to the issuance of currency and settlement of transactions, variances are drawn – with the two tiered model considered to have a preference for the central bank, whilst the sCBDC is considered to favor the private sector.

Arguments in favor of the position that CBDCs are a public good are gaining more support in the light of the recent COVID pandemic. CBDCs are considered to be capable of making life during a pandemic more inclusive – through smart innovation in digital payments, more convenient, as well as efficient. As well as further arguments that digital cash are easier to use, involve lower costs – hence higher efficiency, the need for privacy protection, balanced against the need for regulatory authorities to have adequate verifiable means of identification, have also been put forward.

Of paramount importance is the issue of trust. In contrast to blockchain technologies where trust issues contribute to challenges presented, CBDCs have the potential to engage consumer trust through the involvement of central banks. Moreover, since the use of blockchain technologies necessitate the consumption of considerable amounts of energy, CBDCs present attractive alternatives for consideration. However, as will be highlighted, they cannot serve to substitute – merely as complements.

Literature Review and Background to the Topic

"……..Private stable coins cannot serve as the basis for a sound monetary system. There may yet be meaningful specific uses for them – however to remain credible, they need to be heavily regulated and supervised. They need to build on the foundations and trust provided by existing central banks – thus be part of the existing financial system." (Carsten, 2021:5)

In addressing how central banks can serve as "a catalyst for innovation in the digital age" as well as the application of new technologies to solve real-world problems in the financial system, the following points were raised in the BIS Innovation Summit (2021):

Dangers of crowding out of private sector where central banks dominate the operation and introduction of CBDCs;

Legality of CBDCs: Is the creation of CBDCs legal in all jurisdictions? Such creation requiring consent from jurisdictional parliamentary bodies.

Furthermore, resulting consequences and repercussions where Artificial Intelligence is unduly relied upon by central banks: for instance, the use of algorithms which act in a discriminatory way, were also touched on. Moving to credit allocation on the basis of AI constituting not only ethical questions, but also presenting questions related to financial stability (see BIS Innovation Summit, 2021). Added by J Weidmann, that algorithms present advantages in that they allow better access to credit, better access to risk diversification and also helping to reduce costs in the banking sector.

Further options raised, included teaming up with the Finance Ministry and representatives of the "real economy". It was also highlighted that some of the benefits of CBDCs could also be derived from "tokenized money" – along with a consideration of projects which work with "trigger solutions" - such as blockchains.. With trigger solutions, he adds, the two tier system could be preserved without creating much disruption in the financial system.

The Fed Reserve Chair, Jerome Powell, as well as being in agreement that there was no need to rush the implementation of CBDCs, also confirmed the following points:

Does the public want or need a new digital form of central money?
What exactly is the need, what are the costs and benefits of adding CBDCs?

The need for a consideration of financial stability risks being vital since it was crucial that the two tier system was not de stabilized – not wanting to create a scenario where a bank run occurs. Further, developing an understanding of the weaknesses (and risks) of technological aspects was also considered vital.

As well as emphasizing the need for a more inclusive payment system, stable coins, he further adds, and confirms, cannot provide a substitute for the basis of a sound monetary system.

In relation to the requirement of backing for CBDCs: Comparisons of requirement of backing for stable coins (by sovereign currencies) considered one of those risks, A Carsten is of the opinion that stability is required to be imported from those sources provided their "backing". In relation to public private partnerships, a need to exploit the innovative possibilities of the private sector was highlighted. In this regard a contrast between bitcoins that are not backed and are relatively volatile, was also drawn.

Types of CBDCs

Account based and digital token based CBDCs

CBDCs can be distinguished according to whether they are account based or digital token based (see Carsten, 2021: 7). With the account based CBDC, it is further added, ownership is tied to an identity and transactions are authorized via identification. In contrasting CBDCs based on digital tokens, claims are processed and validated solely on the demonstration of knowledge – such as digital signature (Carsten, 2021:7).

Dangers in respect of security, in the use of the second option are apparent since it is possible for anyone with access to data, files or information on a person, to actually claim ownership – as well as access to such CBDCs. There are therefore credible and justifiable governance concerns in ensuring that fraudulent practices which have been so prevalent and common through the use of digital devices – particularly given the nature of procedures involved in the transmission and storage of data, as well as possible accessibility to third party users, are kept to the minimum.

Other Main Issues to be Addressed

Synthetic CBDCs and two tiered CBDCs

Synthetic and two tiered CBDCs were considered under the introductory chapter. According to Adrian (2020:3), challenges between central banks and private firms are principally related to sCBDCs - particularly the need for level playing field and fair competition. In this respect, interoperability of coins and market contestability are highlighted.

Indeed as he rightly argues, " central banks will have to collaborate with anti trust authorities to strengthen regulation, embed rules in sCBDC licenses and supervise operators.

As well as challenges related to the interoperability of coins and market contestability, a third challenge of payment system stability, as considered under the previous section, is also highlighted.

The Bank of England Discussion Paper, Central Bank Digital Currency (2020), regards the synthetic CBDC by Adrian and Mancini Griffoli (2019) to be an alternative to CBDC whereby "private sector firms issue liabilities which were fully backed by funds held at the central bank – with the firms acting as intermediaries between the central bank and the end users."

In relation to challenges posed by cryptography, it is also highlighted that even though the use of cryptography " a common feature of most DLT platforms", can enhance security, that if private keys are used to authenticate payment instructions, but a user's private key is lost or stolen, the funds may be lost forever – hence the need for high security surrounding the storage of private keys (BoE, 2020:46).

In supporting the idea of an ID backed account based CBDC, Carsten highlights the importance of good identification in providing law enforcement authorities new tools to fulfil their mandate .

As well as distinguishing between two further types of CBDCs, namely the wholesale CBDC – whereby "payments take place between financial institutions and large commercial parties", and that between retail CBDC ("whereby daily transactions take place with households and businesses), he highlights that the latter is more susceptible to "real disruption" (see Carsten, 2021:8).

In relation to financial stability risks, the Bank of England Discussion paper (March 2020) highlights the following as opportunities for CBDC to support monetary and financial stability (see 2020:16):

- Through supporting a resilient payments landscape
- Avoiding the risks of new forms of private money creation
- Supporting competition, efficiency and innovation in payments
- Meeting future payment needs in a digital economy
- Improving the availability and usability of central bank money
- Addressing consequences of a decline in cash
- As a building block for better cross border payments

Conclusion

As highlighted during the recent BIS Summit, in incorporating the introduction and operation of central bank digital currencies (CBDCs), there is need to facilitate level playing field – in having a balanced – as well as consistent approach. In this respect, the manner in which algorithms which generate discriminatory risks can be incorporated such that they not induce more risks than benefits, is also vital. Of paramount importance is the question of trust - which can be conferred through the involvement of central banks. The engagement of anti trust bodies also becomes important in facilitating a level paying field which whilst aiming to foster competition and innovation, are operative on the knowledge that the concentration of too much information and data, in the hands of few, and more importantly a failure to regulate and appropriate exercise adequate governance mechanisms, could result not in the loss of vital information and data, but also in the misuse of such data. Although privacy preferences vary across different jurisdictions, a global based legal regime will be required to facilitate not only the comparability and consistency of procedures, but also ensure that respective legal regimes and their practices are taken into consideration.

Figure 1 Cash vs electronic money in today's two-tier monetary system

Notes: "Cash is a direct claim on the central bank, while deposit accounts are claims on the commercial bank. Commercial banks back some of these claims by holding reserves at the central bank, but such value backing is never full. A CBDC that is unaffected by financial crisis must be a cash-like direct claim on the central bank."

Source: adapted from Auer and Böhme (2020b).

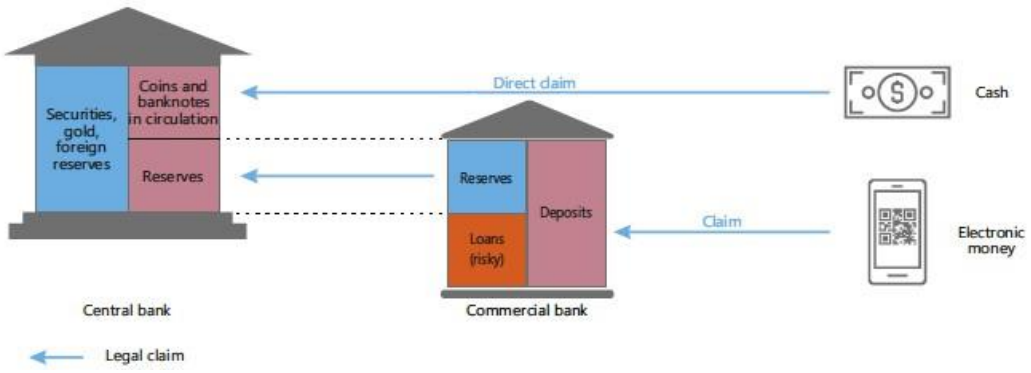
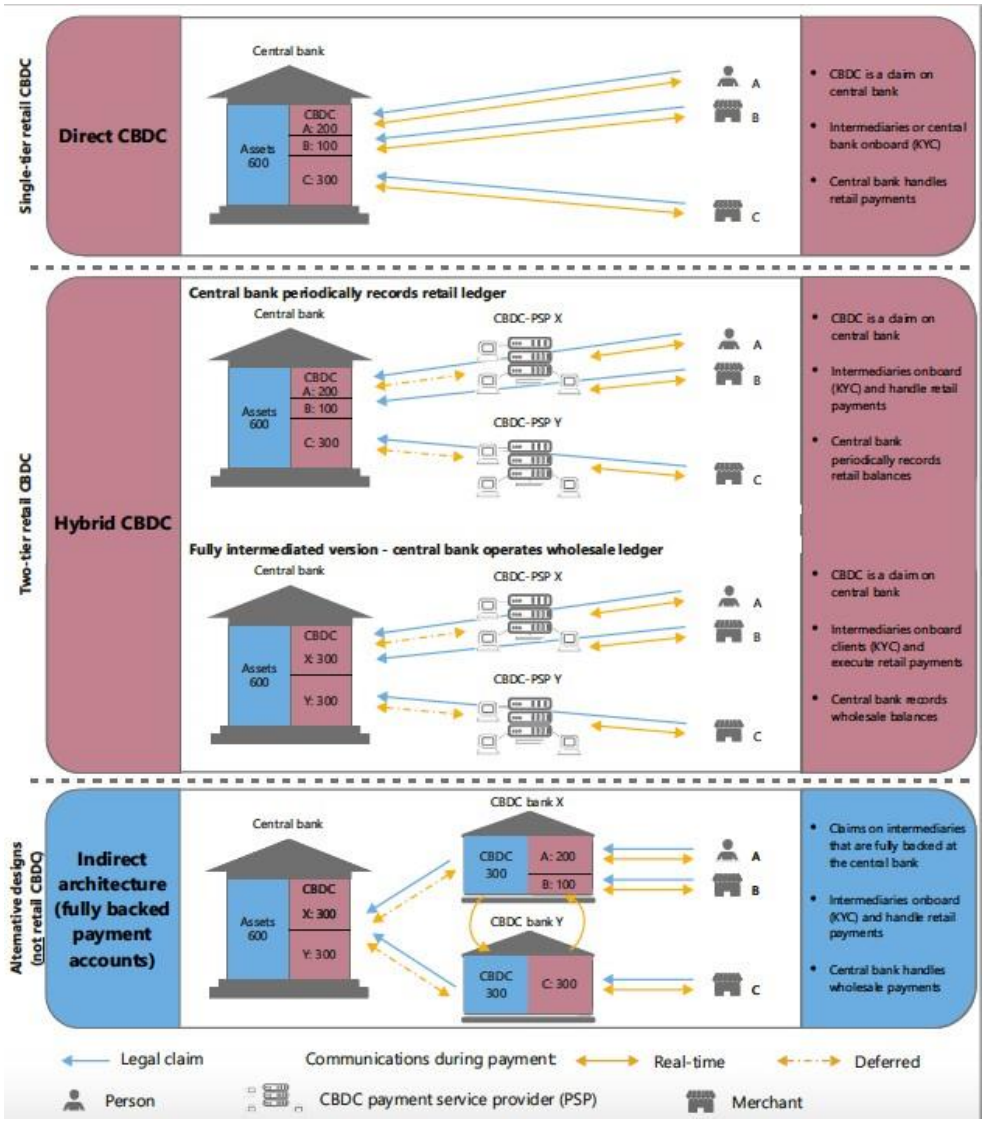


Figure 2 Retail CBDC architectures and fully backed alternatives (source: R Auer and R Böhme, " CBDC Architectures, the Financial System and the Central Bank of the Future, 29 October 2020 Vox EU CEPR)



Notes: A retail CBDC allows consumers to hold a direct claim on the central bank. In the "Direct CBDC" model (top panel), the central bank handles all payments in real time and thus keeps a record of all retail holdings. Hybrid CBDC architectures (middle panel) incorporate a two-tier structure with direct claims on the central bank while real-time payments are handled by intermediaries. Several variants of the hybrid architecture can be envisioned. The central bank could either retain a copy of all retail CBDC holdings (upper variant in the middle panel), or only run a wholesale ledger (lower variant in the middle panel). An alternative to retail CBDC architectures are fully backed payment accounts that feature intermediaries who need to fully back payment account holdings at the central bank (bottom panel).

Source: adapted from Auer and Böhme (2020a).

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