Question: 02. Could some or all of the potential benefits of a CBDC be better achieved in a different way?

Return to CBDC Benefits, Risks, and Policy Considerations | **Provide Feedback**

Question

Return to Top

Could some or all of the potential benefits of a CBDC be better achieved differently?

Answer

Return to Top

If differently means rather than as a Cryptocurrency or a Stablecoin Models? The answer is **Yes** and **No**.

Overview

Return to Top

Almost all Cryptocurrencies implemented so far use the concept of tokens, accounts, wallets, transactions, and distributed ledgers. In essence, these approaches use the way money is handled in bank accounts[1)]. However, the CBDC could also be modeled on actual currency, such as the US Dollar, in essence a true Digital Dollar (i.e., Digital Cash) that includes intelligence. The Digital Dollar could be physical or virtual. [2)]

- **Physical Digital Dollars (PDD)** would be very similar to current printed dollars, but could have a "chip" that prevents counterfeiting and forgery, journal ownership, and can be declared obsolete or unfit and removed from circulation just like paper money is handled.
- **Virtual Digital Dollars (VDD)** would be a virtual containerized implementation of the PDD.

  Note: PDD and VDD would support the same kinds of denominations as the current paper money (i.e., \$1, \$2, \$5, \$10, \$20, \$50 and \$100)

Both PDD and VDD would be designed by the US Department of Treasury. The Federal Reserve Board (FRB) would place a yearly order with the U.S. Treasury for the production of both PDD and VDD just as they do with the current currency. FRB determines the size of the order based on estimates of public demand for PDD and VDD during the coming year and how much currency they estimate will be

destroyed because it is deemed unfit to circulate. PDD can be deemed unfit for circulation, just like paper currency (i.e., damaged, worn, or from an obsolete series) Obsolescence can be because of a change in the physical form of the PDD (i.e, Series) or can be because of the “smarts” on the PDD or VDD are obsolete, close to journaling capacity or have logged an exception during the execution of the software. The US Treasury will be responsible for its production.

Both the PDD and VDD will be signed by the Secretary of Treasury, just like paper money is.

PDD will follow a similar pattern to paper money in terms of distribution.

VDD can be distributed electronically by the Treasury to the FRB. Similarly, the FRB can distribute VDD to the Federal Reserve Banks for subsequent distribution to Commercial Banks, etc.

Each transfer is recorded in the PDD or the VDD internal journal. Every PDD or VDD will be owned by an individual and when the individual relinquishes control of the PDD or the VDD, the next owner can claim the PDD or VDD. This is not unlike current printed dollars. For example, paper money is stored in a physical wallet, the wallet is opened, and paper money is extracted and handed to someone else who places the money in their wallet.

Money that moves through a financial institution is checked for validity and fitness. And just like paper dollars, if the PDD or VDD are deemed unfit, they are removed from circulation. However, the definition of “unfit” is more extensive than with paper money.

Another important aspect of the Digital Money model is that the money can have “colors” albeit not in the physical sense but in the sense of limiting what that money can be used for. For example, money provided by a government for a housing subsidy can only be spent on housing. The money provided for food can only be used to pay for actual food and not alcohol or cigarettes. When money is transferred from one owner to another, the color of the money is checked for validity.

Examples

Return to Top

Some of the potential benefits outlined in the White Paper and summarized by the Object Management Group's CBDC WG White Paper Analysis can definitely be addressed with an alternative model to the one assumed in the White Paper.

The review in this example is not comprehensive but is meant as a demonstration of how an alternative approach might address some of the benefits, policy Considerations, risks, and design objects outlined in the White Paper.

Table 1 provides a cursory overview of using a Digital Dollar Model instead of a Cryptocurrency or Stablecoin Model.

Table 1: Example of mapping a subset of requirements identified in the White Paper Analysis conducted by the OMG's CBDC WG.

Statement No.	Statement	Comments
B0003, P0003	**Complement, rather than replace, current forms of money and methods for providing financial services**	PDD and VDD are intended to work in parallel with existing systems and to follow much the same lifecycle as current paper money. The same institutions would fulfill the same roles they currently do but have added roles and responsibilities for Digital Currency.
B0004, P0004, D0012	**Protect consumer privacy**	Since the journal is kept with each individual Digital Currency rather than on a globally accessible ledger (i.e., journal) then the consumers' privacy is more obfuscated; it becomes more like paper money.
B0005, P0005	**Protect against criminal activity**	Once criminal activity is detected, the Digital Dollars collected as part of the investigation can provide invaluable information for the prosecutors as to the origins of the money.
B0009	**Provide faster and cheaper payments (including cross-border payments)**	PDD would have many of the same problems as paper money, but VDDs can be sent using normal encrypted electronic transfer for files.
B0013	**Provide immediate access to transferred funds**	Once the PDD or VDD is transferred to a payee, the money can be spent exactly like cash
B0030	**Support benefit payments directly to citizens**	Not only can the payments be made directly to the citizens, but the payments may be colored by category: rent, medicine, food, communication, etc.
B0046	**Enable rapid and cost-effective delivery of:** **1. wages,** **2. tax refunds** **3. other federal payments**	PDD would be analogous to current paper money, but the VDD would be immediately available.
R0001	**Risk of affecting financial-sector market structure**	Since PDD and VDD would follow the existing Currency Lifecycle and major financial institutions will have the same roles as they currently have, there should be minimum disruption to the existing financial structure.
R0010	**CBDC has Risk of significant energy footprint similar to Cryptocurrencies**	The use of PDD and VDD does not require costly Consensus Algorithms; therefore, the energy cost should be insignificant.
D0001	**Design should be for a non-interest-bearing CBDC, for example, would be less attractive as a substitute for commercial bank money**	Digital Dollars would be, for all intents and purposes, the same as current paper money. It would not accumulate interest until it is deposited in a financial institution.
B = Benefit Considerations		
P = Policy Considerations		
R = Risk Considerations		
D = Design Considerations		

Discussion of Examples

Return to Top

Table 1 provides a comments column which covers much of the discussion associated with the set of individual requirements. However, the introduction of Digital Dollars introduces a lot of points for discussion. It is recommended that the requirements identified by the Object Management Group's CBDC WG White Paper Analysis need to ultimately be part of a Trade Study for the various alternatives (i.e., Cryptocurrency, Stablecoine, Digital Money). The Trade Study should be based on Conceptual Models, Logical Models and Physical Modes. Where:

- **Conceptual Models** capture the concepts that need to be addressed by any CBDC
- **Logical Models** capture the concepts as expressed in higher level technologies (i.e., Database, GUI, Journal, etc)
- **Physical Models** represent the logical constructs in a particular technology (i.e., Postgres, Oracle, HTML5, CSS, XML, JSON, etc.)

Regardless of which model (Cryptocurrency, Stablecoin, Digital Dollar) is used for the CBDC, the Object Management Group's CBDC WG recommends that the Federal Reserve use a Model Based Systems Engineering (MBSE) and Unified Architecture Framework (UAF) approach for future CBDC efforts. The CBDC is a complex issue that, once released, could have a life expectancy of many, many years. Only through extensive Systems Analysis, Engineering, Design will CBDC have the stability it needs to instill confidence in the public (**B0020**).

Some of the potential requirements in the White Paper as summarized by the Object Management Group's CBDC WG White Paper Analysis reflect the need to instill public confidence (See Table 2

Table 2: Some requirements in the White Paper that require the confidence of the public.

Statement No.	Page No.	Statement
B0020	**13**	Maintain public confidence by not requiring mechanisms, such as deposit insurance
R0003	**3**	**Risk** to the safety and stability of the financial system
R0004	**3**	**Risk** to the efficacy of monetary policy
R0005	**7**	New payment services could pose **Risks** to: 1. financial stability 2. payment system integrity 3. other **Risks**
R0011	**11**	Increased **Risk** to consumer's vulnerability to: 1. loss 2. theft 3. fraud

1)

99% (if not all) issued Initial Coin Offering (ICO) tokens on top of the Ethereum implements the ERC-20 standard.
https://www.omgwiki.org/dido/doku.php?id=dido:public:ra:xapend:xapend.b_stds:defact:ethereum:eip:erc_0020

2)

FinTech Futures, 31 January 2020, Why is digitised cash better than stablecoins?, Accessed: 20 March 2022, https://www.fintechfutures.com/2020/01/why-is-digitised-cash-better-than-stablecoins/