GDF

GLOBAL DIGITAL FINANCE

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The Age of Public Digital Currency:

A Guide To Issuance

Contents

Foreword

In the past 18 months the subject of Central Bank Digital Currency has accelerated dramatically from potential research areas, to key policy agenda. Unquestionably, this has been driven by developments in Facebook-initiated Libra where the spectre of the private sector playing more of a role in medium of exchange and store of value was entirely possible.

In this time we've also seen the People's Bank of China develop it's Digital Currency Electronic Payment platform (DECP), which it is aiming to streamline and improve the connectivity between central bank payments, the commercial banking sector and big techs who play a crucial role in payments.

In its recent whitepaper on CBDCs the Bank of International Settlements found that at least 48 central banks now have some active research or proof of concept in development for CBDC. Since the rise of the COVID-19 pandemic, cash circulation has dropped significantly in many economies, digital payment types have increased, and the focus on efficient, fair and transparent payments has become high profile in all areas of the economy.

The subject is vast, and offers opportunities to potentially drive real policy opportunities, market efficiency and perhaps most excitingly, better outcomes for consumers around the world. There are a number of great documents and papers on this subject, however it is increasingly difficult to stay on top of it all. So, GDF's Digital Currency Working Group has pulled together this report to offer the current state overview from an industry perspective.

Lawrence Wintermeyer
Executive Co-Chair,
Global Digital Finance

Simon Taylor
Co-Chair & Guarantor,
Global Digital Finance

Authorship

This report has been developed by the members of GDF's Digital Currency Working Group, which focused on how governments can provide payments using modern, digital technologies. It provides first principles that should be considered, offers examples of private solutions that exist and work today, and provides a framework for the construction of modern, effective, and faster government disbursements to citizens and businesses.

Working Group Co-chairs

John Collins
Partner FS Vector   ≫ F S V E C T O R

John has diverse government and industry experience and is a globally recognized fintech and cryptocurrency policy leader. He served as the first Head of Policy for Coinbase and as Vice President for International Policy at the Bankers Association for Finance and Trade, the international subsidiary of the American Bankers Association. He most recently led the U.S. office for Red Flag Consulting, a global public affairs and business consulting firm. Prior to his time in industry, John served as Senior Professional Staff for the U.S. Senate Committee on Homeland Security and Governmental Affairs and was the lead staffer for the U.S. Congress' first work into virtual and cryptocurrencies in 2013.

Lavan Thasarathakumar,
Head of Regulatory Affairs, EMEA, GDF

Lavan is a former Advisor at the European Parliament and advised on a number of files including: fintech, virtual currencies and distributed ledger technologies. He was also the rapporteur on the European Crowdfunding Service Providers Regulation and the Comprehensive European Industrial Policy on Artificial Intelligence and Robotics.

In September 2017, Lavan helped establish the European Parliament All-Party Innovation group to promote discussions on matters concerning emerging technology and what policy responses the Parliament should promote.

A special thanks the following members of the Digital Working Group

- Elsa Madrolle
- David Abner
- Vipin Bharathan
- Bill Genovese
- Lee Brenner
- Lex Sokolin
- Nick Davies
- John Jefferies
- Marc Powers
- Herve Francois
- Diana Barrero Zalles
- Sean Liu

I. Introduction

Once limited to the attention of a small group of computer scientists, political activists, and economic theorists, digital currencies are now being actively discussed, developed, and launched by central banks and governments around the world. A survey from the Bank for International Settlements (BIS) showed that 70% of central bank respondents have been exploring Central Bank Digital Currencies (CBDCs). Boston Consulting Group research reveals 48 countries have researched, piloted, developed, or launched CBDC projects as of August 2020, click here to view a country-by-country overview. The recently launched BIS Innovation Hub has CBDCs as a central topic in its work agenda to support the innovation priorities of the central bank community. The COVID-19 pandemic and resulting economic crisis have only hastened these conversations and work, bringing forth the need for secure and direct digital payment mechanisms, particularly to distribute stimulus funds. Moreover, the private sector and global projects have raised questions around the future use of fiat or sovereign currencies and of cash, how the private sector and government will interact and contribute to that future, and how policymakers and the public at large should approach it.

This paper discusses CBDCs in the greater context of cryptocurrency and stablecoin developments, the digital wallets in which they are held, and policy and security considerations that are key to successful implementation. With that in mind, we hope to provide a framework and recommendations for the global policymaking community on the public policy choices, practical realities, and challenges of deploying a "digital dollar" or public "digital wallet" infrastructure.[1]

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1   For the purposes of this paper we will use "Digital Dollar" to represent any fiat currency issued by a central bank or government that is intended for retail use.

II. How cryptocurrencies developed

The first academic paper on blockchain technology and attempts at creating untraceable digital pseudonyms that would act as digital currencies emerged shortly after the creation of the internet in the 1990s. It would take nearly two decades before Satoshi Nakamoto's whitepaper on Bitcoin in 2008 marked the birth of modern cryptocurrency as we understand it today. In 2009 the first Bitcoin was mined, and in 2010 the first virtual asset exchange was created. The computer science breakthrough that enabled blockchain technology is evolving quickly and has since created a huge variety of applications, with hundreds, if not thousands, of coins and tokens launching or created from or for networks and platforms each year. However, low levels of liquidity paired with price volatility severely limited the mainstream use case of digital asset payments until the introduction of stablecoins.

A stablecoin is a cryptocurrency or digital currency that is structured to minimize price volatility, thus enabling it to adequately serve as a non-fluctuating medium of exchange and a store of value[2]. The majority of stablecoins are designed to be equal in value to a fiat currency (e.g. the US dollar). There are a number of stablecoins in the market that vary in structure and common use. A digital dollar is only one such example.

The world's first digital dollar stablecoin, BitUSD, was released in July 2014; however, it wasn't until Tether was listed on Bitfinex in 2015 that the asset type gained global notoriety. By 2019, there was a proliferation of proposed stablecoin announcements, to be used both in private and public blockchain commerce, from JPMorgan, to the Libra Association, to the central bank of China.

In March 2020, as the US Congress considered legislation to soften the economic recession coming from the COVID-19 pandemic, several of its members proposed legislation that featured a CBDC. This solution incorporated a digital wallet to enable all Americans, including the most vulnerable and unbanked, to receive COVID-19 federal aid directly via a "digital dollar".

A. Analyzing stablecoins

Viewing stablecoins from different angles can produce different perspectives on the "primacy" of their individual characteristics, which may affect policymaking. Three perspectives for consideration are backing, pricing and decentralization:

- "Backing" - how they are collateralized or stabilized to control volatility (e.g. collateralized or backed with fiat monies or stabilized with an algorithm). We should note that being backed and collateralized may have different legal implications with respect to investor recourse in the case of losses (e.g. whether investors have a claim to assets held in reserve).

- "Pricing" - the value that they reference (e.g. 1 USD, the value of 1 gram of gold, or a basket of currencies).

- "Decentralization" - e.g do they rest on a fully transparent public blockchain or on a permissioned, private blockchain where data privacy, participants and scaling can be managed?

For more on this topic readers should consult the Global Digital Finance paper 2019.[3]

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2   A cryptocurrency tends to be defined as a token or "coin" that utilizes an open blockchain to function. A digital currency may utilize an open blockchain but could also be enabled by a "closed" or proprietary blockchain.

3   https://www.gdf.io/wp-content/uploads/2019/10/GDF-Stablecoin-Key-Considerations.pdf

B. Stablecoin developments and use cases

While stablecoins initially sprung from private endeavours to help investors hedge against the volatility of the cryptocurrency market, a CBDC dollar could be issued by the Federal Reserve and/or OCC and disseminated through the US via the existing two-tiered banking system of traditional banking institutions and intermediaries to end users. It would have to be interoperable and co-exist with current and future financial infrastructure both domestically and abroad. It should act as a catalyst for the private sector to innovate and upgrade this infrastructure. With the US dollar as an example, tokenizing or making the USD digital transforms it from an analog fiat currency to a *digital currency* that can be shared and tracked across borders with the greatest of ease, thus preserving the USD's status as the world's premier reserve currency. New projects such as Hyperledger's eThaler[4] (built on Ethereum) and the Digital Dollar Project[5] continue to advance the digital USD case rapidly.

There are a number of use cases that require reduced volatility to eventually have real consumer adoption:

- Remittance - requires reduced volatility while payments are being processed

- Commerce & payments - for any business to accept day-to-day payments, salaries, etc

- Financial inclusion - unbanked and underbanked

- Lending markets - long-term issuances

- Store of value for long-term hedging - traders or miners

- Escrow

- Alternative banking

C. Roles of digital wallets

A cryptocurrency wallet is a critical component of the cryptocurrency ecosystem. It is a piece of software that verifies ownership of the keys used to digitally sign cryptocurrency transactions for distributed ledgers. Wallets come in several forms, including software and hardware wallets, and can be deemed "hot" or "cold". "Hot" wallets are accessible over an internet connection and available for open interaction by users on the blockchain. This increases access but also their susceptibility to hacking and theft. Cold wallets are typically "offline", not accessible via an internet connection.[6] Digital currencies issued by central banks will require the creation of digital wallets for retail use. This poses additional questions around transparency and governance.

In April, draft legislation was proposed in the US Congress that suggested the Federal Reserve itself would maintain wallets on behalf of individuals, in addition to issuing the underlying digital dollars.[7] Thoroughly understanding the function and challenges of a digital wallet, including the differences between custodial and non-custodial wallets, forms a key part of the strategy for deploying a stablecoin.

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4   https://decrypt.co/23603/ethaler-time-to-issue-digital-dollars-on-ethereum
5   https://www.digitaldollarproject.org/

6   A simple way to think about "hot" vs. "cold" is the difference between a bank teller's drawer and the bank's safe.
7   https://www.coindesk.com/digital-dollar-reintroduced-by-us-lawmakers-in-latest-stimulus-bill

III. Solutions available today

There are a wide variety of stablecoins available today. As of June 2020, there were more than 50 different stablecoins available in the market for use or trading, with a wide variety of upcoming new initiatives. The most publicized is the Libra project, expected to enter the market sometime in late 2020 or Q1 2021.

The following grid presents the largest projects currently in the market, as of September 20, 2020, with a view of assets, collateral structure, and some additional details.

Issuer	Ticker	Mkt. Cap ($)	% of Stablecoin Market	Backing	Details
Tether	USDT	9,142,785,841	86%	Fiat	Owned by Bitfinex, seen as a way to have exposure to hedge into a more stable asset without leaving the digital universe.
Centre	USDC	740,135,031	7%	Fiat	1:1 USD, ERC20 standard token on Ethereum Network, created by Circle and Coinbase.
Paxos	PAX	251,902,524	2%	Fiat	1:1 USD, based upon the Paxos Standard tokens.
Binance	BUSD	179,423,669	2%	Fiat	1:1 USD, conversion to other coins on Binance (USDT, USDC, TUSD, PAX), ERC20 and BEP-2.
TRUE	TUSD	140,107,753	1%	Fiat	1:1 USD, ERC20 standard token on Ethereum Network.
Huobi	HUSD	121,677,908	1%	Fiat	1:1 USD, run by Paxos, similar structure.
Maker DAO	Dai	10,180,509	0%	Crypto	Collateralized by pooled Ether and multi-collateral Dai that are price stabilized against the USD, using crypto as collateral. Requires over-collateralization and created a debt position of the collateral for creation of the Dai.
Gemini	GUSD	8,653,192	0%	Fiat	Issued by NY Trust Company, strictly pegged to USD 1:1, ERC20 standard token on Ethereum Network.

Source: [cryptoslate.com 8/25/20]

IV. Policy considerations

A. Security

A digital dollar will need to be designed with security in mind from the outset, beginning with a formal specification of the protocol that enables it. This specification should be subjected to careful public review and testing. A well-designed system of roles and permissions will be critical to protect the system from malicious administrators and hacking.

When expert review has determined the specification to be valid, it may then proceed to implementation using a modern systems programming language. Multiple implementations may be beneficial for enabling a resilient network. The implementation(s) should then be formally verified against the specification.

For additional assurance, other forms of security assessment should be performed as well, including manual code review and automated analysis techniques, such as fuzz testing and symbolic execution.

During the early stages, the network should have no more than the minimum necessary functionality. Additional features may be added over time by iterating on the process described above.

A bug bounty program should be created to incentivize security researchers to report vulnerabilities so they may be addressed before they can be exploited.

The recommendations above address the security considerations of the digital dollar protocol. Similar precautions will be required at every layer of the stack. For example, the users of a digital dollar will require education and/or robust tools enabling them to safely manage their funds.

B. Privacy

The programmable nature of virtual assets can enable more nuanced privacy controls and support privacy by default. For instance, privacy enabled CBDCs could enable users to reveal private details when they choose and enable authorities to view transaction details on large or suspicious transactions. Blockchain analytics has the power to identify illicit and high-risk sources of funds and provides greater transparency. The visibility afforded by distributed ledger technology (DLT) enables greater visibility into transactions, offering the ability to more easily identify potentially illicit activity. That said, this capability must be balanced with the potential abuse that could arise with unnecessary surveillance.

In order to maintain the levels of consumer privacy we enjoy with cash, neither the central bank nor its government should have direct access to universal unshielding capability (aka no backdoors). Transactions should only be unshielded by government authorities when the virtual assets are used in illicit purchases or when the CBDC is used for the proceeds of illicit commerce as evidenced by blockchain analytics. Further, perhaps, this should only be allowed upon court review and order. Considerations should also be had of whether notice should be given to the parties involved.

Privacy concerns are heightened with digital currencies because they could expose the user's entire transaction history and net worth. Essentially, the privacy mechanism should protect wallet balances by default and only reveal balances required to settle the transaction at hand (e.g. a barista should not learn his wealthy patrons' net worth, nor the car dealer know that the student spent her last penny on transportation). In many countries, privacy and freedom of speech are protected rights.

C. Anti-Money laundering (AML)

As CBDCs move toward the mainstream, it will be critical to defend consumer privacy while still protecting society from harm through illicit finance. Any CBDC payment system should be compliant with AML/CFT regulatory requirements. This should be done without compromising user privacy, as privacy is vital to a CBDC's adoption to becoming a trusted and widely used medium of exchange for consumers. As the virtual equivalent to fiat, it is feasible to replicate and even tune the privacy aspects of cash, while still maintaining compliance with AML/CFT regulations.

Similar to value-based reporting for transactions over a threshold, the depositors into a central bank digital wallet should be expected to demonstrate the source of funds for transactions over a threshold amount of $1000 or $3000 depending on the jurisdiction. Suspicious transactions uncovered through blockchain analytics, customer interviews, or otherwise should be automatically reported to the jurisdiction's financial investigation units. CBDCs should be expected to comply with the FATF travel rule, Recommendation 16, and cross-border transactions involving jurisdictions that do not enforce the travel rule should be restricted after the sunrise period.

D. Identity

In an institutional setting for wholesale CBDC, institutional practices with an appropriate process for strengthening privacy must be followed. Smaller transactions may have a smaller, more focused quorum compared to larger ones. A multi-tier approach is possible, with the private keys being held in a cold wallet or a Hardware Security Module. Appropriate multi-party ceremonies would be used to access the segregated key, which never leaves the secure premises. Externally, an organizational wallet can link to the Legal Entity Identifier anchored in a registry like the Global Legal Entity Identity Foundation. This way the certificates and public keys are linked to roles in the organization. Revocation and timely updates to roles are always the greatest challenges.

For a retail CBDC, risk-based identity management is the key. Multi-factor authentication, such as biometrics, strengthens the connection of user identity with the device identity. Secure and regulated national identity systems have helped many countries leapfrog into the digital age. For small transactions below the equivalent of $1000, FATF guidance allows for anonymous accounts to participate. Small CBDC transactions should be allowed to happen in a true peer-to-peer manner, even in disconnected settings where there is no internet connectivity. Wallet design will be key, and wallets for general distribution can rely on a variety of platforms: mobile phones and tablets are a natural option, and inexpensive smart cards that have inbuilt cryptography are another. Today, cash can be held by non-citizens, tourists, or residents of external countries; retail CBDC wallets should allow such peer-to-peer transfers as well. When it comes to larger amounts, held or transferred, sovereign governments will insist on transactions being controlled between identities that are formally checked using KYC/AML and/or other methods.

E. Issuance/Governance

In most countries, it would be the province of the respective central bank or treasury department to issue a CBDC or digital dollar, as it is already responsible for the issuance of paper currency. The digital dollar would be distributed through the existing banking system; however, in the U.S., new federal legislation will need to be enacted to authorize the development and use of a digital dollar.

For the United States, new legislation should consider authorizing the OCC, in consultation with the Financial Stability Oversight Council (FSOC), with primary authority to issue regulations on the issuance and permitted uses of the CBDC dollar. In July 2020, the OCC formally allowed federally chartered financial institutions to maintain digital custody services for their clients, or digital wallets. This is a clear precursor to a digital dollar. It is an unlikely coincidence that Brian Brooks, the new head of the OCC, is the former CLO at Coinbase and a former active member of GDF.

The FSOC was formed from the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 and is statutorily mandated to create collective accountability of its 15 federal and state members for risks and response to emerging threats to U.S. financial stability. Among other things, the regulations would be expected to consider AML, privacy, cybersecurity, interoperability, custody, and identity issues. Policymakers should think seriously and thoughtfully as to who is best suited to develop and issue a digital dollar as it is a growing concern amongst public and private stakeholders alike.

F. Custody

A retail digital dollar may end up being in great demand due to its liquidity and zero rate lower bound. Custodial services bundled with other services may become the norm for such an asset, especially for large holdings of retail digital dollars.

Retail digital dollars tend to follow one of two models: account-based or token-based. Most of the retail digital dollar proposals, such as the ones offered in the US that seek to emulate cash are exploring a token-based approach. Almost all of them call for a two-tier system.

As discussed earlier, digital dollars, being an inherently digital product, requires custody through a digital organizational wallet. Self-custody for smaller amounts and for retail spending could be accomplished through a personal wallet, perhaps held and accessible via an individual's mobile phone. For a token-based model, the actual tokens would follow current regulations and are held in a separate, custodial wallet. Using a third party to maintain custody of the tokens is advisable to guard against theft or wallet hacks. Through lessons learnt from crypto-assets custody, management of private keys can be implemented to avoid loss of public digital currencies.

Custody and digital asset transfers can either be based on hardware (Hardware Security Module or HSM) or software (Multi Party Computation or MPC). In the case of MPC, the private key is decentralized and managed via different nodes that hold a portion of the information required to retrieve the private key. In the case of HSM, a multi-signature process can be established to guarantee that all parties approve before a key is used to move funds. Rules must be made clear on matters such as regulatory compliance, adequate insurance, and shelter from the bankruptcy of the custodian. The custodian will need to be a well-regulated entity to prohibit unilateral moving of funds.

G. Interoperability

A digital dollar should be designed and implemented with interoperability through the following dimensions:

- Transactional Function: interoperability with the existing financial global system for payments, credit/lending, storing, protecting (insuring), and investments of financial assets.

- Technical: interoperability with the standardised technical standards and protocols that support payments, credit/lending, storing, protecting (insuring), and investments of financial assets. It should be tightly interoperable and programmable with other standard technologies. It should leverage and use common Cloud services, technologies and orchestration, and programming languages for policy management, automation, and easier systems management.

- As a Unit of Exchange/Value: interoperability and exchangeability with existing fiat currencies, CBDCs, and any other officially government regulated currencies, including other government currency backed digital currencies and stablecoins.

H. Role of banks

During the move towards a CBDC architecture, commercial and central banks could be involved in either a retail CBDC or wholesale CBDC, such as the Fnality project.

The distinction between a retail CBDC and a wholesale CBDC has a two-fold effect on banks. First, it would determine the holder of the asset on the balance sheet. Commercial banks would be the designated holders for a wholesale CBDC, whereas central banks would take that place for a retail CBDC. Second, it would impact the designator of the asset's transfer execution. In the case of a wholesale CBDC, commercial banks would continue to serve that role; however, a retail CBDC would mandate that central banks fulfil the role.

In general, a CBDC would enable faster, cheaper, and more transparent payments for clients, especially for international payments with banks that lack a local banking license. A CBDC would also improve cash/ treasury management during the life cycle of client and commercial bank transactions. Moreover, a CBDC would improve solutions to working capital needs and provide a "value chain" optimization by providing programmable transactions to clients (conditional settlement, automated

rebates, etc.). Lastly, a CBDC would enhance credit exposure by taking some risks away via conditionalized payments (smart contract-based) and smarter collateral management (when pre-funding a transaction for instance).

Even with the adoption of a pure retail CBDC, commercial banks would still be able to provide different services around the token. For example, they could provide custodial services to their end users (private key management services), as well as services centered around validation and ensuring financial transactions comply with KYC requirements. Multiple service layers could also be provided by banks through their wallets, such as "programmable money," IOT integration, and data analysis. Moreover, banks would likely continue to play the role of a secure lending counterparty on digital assets or broker digital asset payments. Finally, specialized services such as investment management, fund management, and letters of credit can still be performed by commercial banks.

When adopting a CBDC, banks will face a multitude of challenges, beginning with the heavy investment required to fund new DLT/blockchain technologies. Banks would also risk losing privileged relationships with other financial institutions (especially with the current corresponding banks system) while shifting their business strategy. Finally, central banks themselves would require heavy investment in system resilience and cyber-security. They would also need to adapt to the burden of managing a large balance sheet with financial stability risks.

I. Credit
Credit is an important part of the wholesale, large value payments infrastructure. Hence, we concentrate on wholesale CBDC first and the effects on credit.

Daily large value interbank payments volume is 100 times the deposit balance held at the central bank. Therefore, interbank high value payment volumes will be more than 100 times any wholesale CBDC held by banks. Liquidity crunches result when there is continuous settlement. Banks rely on incoming payments to finance outgoing payments. This means periodic netting and settlement using Real Time Gross Settlement ("RTGS").[8] Wholesale CBDC can be used in RTGS independent of the central bank, creating a decentralized infrastructure for RTGS.

Current wholesale payment infrastructure sources of liquidity include reserve balances at the central bank, borrowing from money markets, credit extension from the central bank, and incoming transfers from other banks. Of these, the central bank credit extension can be in the form of wholesale CBDC with special programmatic restrictions. Short term lending of CBDC is also possible to satisfy ephemeral liquidity needs, resulting in the development of a repo market. If so, standing instructions to custodians from clients could result in this market taking off.

Retail CBDC can also be used in credit markets. Today, there are some popular crowdfunding platforms. While holding the safest asset, it is possible for ordinary people and smaller businesses to lend retail CBDC seeking higher yield. Clearly, the higher risk of these loans requires vigilance and higher yield. Unlike cash, this can be relatively friction-free; of course, lenders' risk appetite and desire for yield play an important part in this equation.

J. Monetary stability
The US Dollar is the reserve currency of the world economy. Its stability relative to most global currencies has given it the credibility to be widely accepted as a medium of exchange and store of value. Its use for international transactions largely rests on its robust infrastructure to support widespread transactions, clearing, and settlement. This relies on deep and liquid financial markets and derivatives markets for hedging exchange and interest rate exposure, with adequate underlying technological frameworks and operational channels. It also relies on The United States' history of economic and political stability, rule of law, and the overall trustworthiness it represents both domestically and abroad.

The infrastructure on which the US dollar runs is a critical public good. A tokenized dollar would propose an infrastructure upgrade that would continue to support and advance the global competitiveness and stability of the US dollar in light of technological trends that support broader market opportunities, wider accessibility and flexibility, cost reductions, and efficiency of transactions. As the world's reserve currency, the US dollar would undertake a digitized format in order to measure, support, and transact with increasingly digitized forms of value.

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8   The term real-time gross settlement (**RTGS**) refers to a funds transfer system that allows for the instantaneous transfer of money and/or securities.

The US dollar as a source of stability is particularly important in the current global economic context of high uncertainty. Consumers, businesses, and governments rely on this stability. Ultimately, the status of the US dollar in a digitized format would rest upon the Federal Reserve's and OCC's provision of the innovative functionalities required to uphold a digital global economy. The United States has been a global leader in advancing major innovations that have transformed society, including the internet.

K. Resiliency, Performance, and Scalability

A digital dollar should be designed and implemented with resiliency, performance, and scalability in mind.

For resiliency, it must be available 24/7 to support usage and operations for digital financial services, such as payments, remittances, credit/lending, storing, insuring, trading and investments of financial assets. Other considerations should be undertaken to ensure that its value for critical goods and services (emergency, housing, transportation, healthcare, food, water, utilities) is maintained through "velocity usage" such that its exchange is neutral in times of emergencies for procurement of critical goods and services (for example, in a UBI system where it must be available and value-neutral for a specific set of emergency critical goods and services during government-disasters). It should also be fully resilient and "disaster-recoverable" in terms of all credit, market, and operational risk, including cybersecurity and environmental risks.

For performance and scalability, it must perform and be supported by infrastructure at high levels of throughput, I/O, bandwidth, and latency. It should also scale to the minimum performance levels of the highest benchmarked financial systems today for payments, credit/lending, deposits, insurance administration, and trading. Existing system benchmarks should add a factor of 20-25% to reflect the recent COVID-19 performance stress scenarios on common financial services.

L. Consumer protection

When adopting a digital platform for current fiat currencies consumer and investor protections are essential to providing and maintaining the level of credibility that sovereign-backed money has traditionally held. This includes implementing safeguards in proportion to the additional risks that CBDCs may create. It also involves maintaining operations that are in the best interest of customers and consumers and taking measures to ensure proper and secure conduct. Users must be adequately informed about the risks.

In the United States, the Consumer Financial Protection Act (CFPA) prohibits unfair, deceptive, or abusive acts or practices by providers of consumer financial products and services.[9] The Federal Trade Commission Act (FTC Act) prohibits unfair and deceptive acts or practices in commercial activity.

The following measures may be considered best practices to ensure consumer and investor protections:

- Measures to ensure users are made whole in the case of losses due to hacks, fraud, theft, or mistakes in sending funds to the wrong wallet

- Systems and controls in place for wallets and custodians, IT systems, cybersecurity

- Adequate use and protection of client data

- Policies to handle customer complaints

- Audits

- Risk assessments and due diligence

- Effective governance systems

- Anti-fraud policy

- Cybersecurity program and policy

- AML program and policy, ensuring compliance with AML policies and FATF recommendations, such as The Travel Rule and obligations for disclosure and sharing of information

- Business continuity and disaster recovery program

UDAAP abusive acts and practices entail those which:

- Materially interfere with the ability of a consumer to understand a term or condition of a consumer financial product or service

- Take advantage of a lack of understanding on the part of the consumer regarding material risks, costs, or conditions of a product or service

- Take advantage of the inability of the consumer to protect their interests in selecting or using a consumer financial product or service

- Take advantage of the reasonable reliance by the consumer to act in the interests of the consumer

M. Financial inclusion and access

Accessing the traditional banking system for a new banking client often includes hurdles such as presenting formal government identification, a minimum deposit, and access to a local branch. Rural regions and poor communities often suffer because of these restraints, resulting in a lack of financial inclusion. As a result, individuals who don't have access to banks turn to collateralized loans or microfinance organizations to borrow money. Many of these organizations charge high rates for access to currencies and cash. As financial systems become increasingly digital, those without access will be further left behind the digital world and commerce.

Digital currencies, including a CBDC, could address the issues experienced by underbanked and unbanked communities by providing alternative access to financial services. CBDCs can be integrated with private fintech providers to leverage a central bank-housed digital account. As a result, a more inclusive digital payment system would be established, financial data identities would be created, and users would build a credit history. For the first time, underbanked communities would be able to participate in the financial system, streamlining more cost efficient payments, deposits, and transfers. These are crucial steps in incorporating the unbanked and expanding financial inclusion.

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9   https://files.consumerfinance.gov/f/documents/102012_cfpb_unfair-deceptive-abusive-acts-practices-udaaps_procedures.pdf

V. Summary

There are a number of critical issues which we have outlined that should be considered and addressed by policymakers before a public digital currency is issued. The widespread adoption and use of a CBDC would represent a monumental shift in how citizens, businesses, and governments fundamentally interact with fiat currencies and cash. Security, safety, resilience, and fairness, among other factors, should drive the development and execution of these projects. Policymakers should think hard and use the accumulated knowledge of the private sector to help build and maintain these critical systems. The benefits to global business and small communities alike are well worth the time and effort.

VII. Further reading

1. https://www.bis.org/speeches/sp190207_slides.pdf
2. Central Bank Digital Currencies
3. The Digital Dollar Project: Exploring a US CBDC
4. Central Bank Digital Currency: An Innovation in Payments
5. Central Bank Digital Currency: Opportunities, Challenges and Design
6. The Rise of Central Bank Digital Currencies: What You Need to Know
7. A Survey of Resesearch on Retail Central Bank Digital Currency
8. Central Banks and the Future of Digital Money (Consensys white paper)

GLOBAL
DIGITAL
FINANCE

Headquartered at:
Kemp House
160 City Road
London
EC1V 2NX
United Kingdom

Contact us:
e: hello@gdf.io
w: www.gdf.io

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