

# Designing and Regulating Retail Digital Currencies

Steven L. Schwarcz

## Key Points

- Governments and multinational organizations are exploring the feasibility of developing “retail” digital currencies, sponsored by governmental central banks or privately issued, which consumers could use on a day-to-day basis as an alternative to cash.
- Central bank digital currencies (CBDCs) could be either account-based or token-based. Privately issued digital currencies would likely be token-based. Private issuers are focusing on “stablecoins,” which are digital currencies backed by assets having intrinsic value.
- Retail digital currencies raise new regulatory issues in addition to those typically associated with money and payment systems.
- The most successful retail digital currencies are likely to be used not only domestically but also in cross-border transactions, which can be costly. They therefore should be designed, regulated and supervised to reduce these costs and, ideally, also to increase consumer accessibility — and thus to broaden financial inclusion.

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## Introduction

Their potential to improve the speed and efficiency of payments and to broaden financial inclusion makes digital currencies — monetary currencies that are evidenced electronically and not in physically tangible form — an important part of our future.<sup>1</sup>

Large payments among businesses and financial institutions (“wholesale payments”) already occur digitally, and bitcoin has been with us for more than a decade. Three recent events, however, have catapulted the prospect of a “retail” digital currency — one that is used by consumers on a day-to-day basis as an alternative to cash, both domestically and across national borders — to the fore.

First, the People’s Bank of China (PBOC) has recently introduced a retail digital yuan. The US government fears that such a digital currency, if successful, might further leverage the yuan into position to replace the dollar as the world’s reserve currency. Second, Facebook and others are in the process of developing Libra, a blockchain-based global digital currency.<sup>2</sup> Under the threat of private competition that might impair their control over monetary policy, many central banks have voiced concerns over the Facebook project and accelerated their own work into digital currencies. More recently, to

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1 This policy brief is based on the author’s article “Regulating Digital Currencies: Towards an Analytical Framework,” 102 *Boston University Law Review* (forthcoming April 2022); also available at <http://ssrn.com/abstract=3775136>.

2 Although Libra is being rebranded as Diem, this policy brief will use the original brand name to avoid confusion.

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## About the Author

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control the spread of COVID-19, retail businesses have restricted the exchange of physical cash.

In response to these events, governments and multinational organizations have begun exploring the feasibility of developing retail digital currencies for domestic and global payments. Although these explorations so far provide only aspirational generalizations, they help to define the emerging categories of digital currencies. One category is digital currencies sponsored by governmental central banks, which typically are referred to as CBDCs. Another category is privately issued digital currencies.

Privately issued digital currencies can be divided, in turn, into currencies that are, or are not, backed by assets having intrinsic value (sometimes called reference assets). Privately issued digital currencies that *are* backed by — meaning they are redeemable (that is, exchangeable) for — assets having intrinsic value are generally referred to as stablecoins. Facebook’s proposed Libra exemplifies this category. Privately issued digital currencies that are not backed by assets having intrinsic value are simply generic cryptocurrencies, as exemplified by bitcoin.

This policy brief does not address bitcoin or other privately issued digital currencies that are not backed by assets having intrinsic value. At least at present, those currencies have unpredictably fluctuating market values. A successful currency must have a stable value.

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## CBDCs

### Developing CBDCs

The main challenges to developing any retail digital currency are increasing accessibility and reducing cost. Accessibility refers to consumers having day-to-day access to, and the ability to transfer, digital currencies. Cost refers to consumers achieving that access and transferability on a cost-effective basis given that retail currency transfers typically are small compared to wholesale currency transfers.

For CBDCs, two approaches have emerged: account-based CBDCs and token-based CBDCs. In an account-based CBDC, the currency represents a deposit at the central bank or its agent bank

(for example, a commercial bank). A currency transfer involves debiting the transferor's account and crediting the transferee's account. These are simply book entries in accounts that are held and managed by banks. In a token-based CBDC, the currency represents "tokens" issued by the central bank. The record keeping is maintained through a central-bank-specified form of identifying currency transfers. A currency transfer involves the transferor producing a digital "signature" that verifies the transfer of token ownership to the transferee.

Different jurisdictions are taking different approaches to developing a retail CBDC. The European System of Central Banks has engaged in a proof-of-concept for a token-based CBDC, designed to preserve cash-like privacy for CBDC transactions. The digital yuan being developed by the PBOC appears to combine account-based and token-based features. For both path-dependent and cost considerations, a retail CBDC in the United States is likely to be account-based, at least initially.

A basic design question for an account-based retail CBDC is whether the accounts should be at the central bank or at commercial banks. Maintaining those accounts at commercial banks — what is sometimes called a "hybrid" structure — should be less costly and disruptive because depositors would not need to change their current banking arrangements to use the CBDC, central banks would not need to reconfigure their deposit-taking to include consumer accounts and commercial banks would not need to replace the primary source of their low-cost funding (consumer deposits).<sup>3</sup> To avoid the possibility of inconsistent treatment, especially of cross-border CBDC payments, central banks should consider coordinating their rules and regulations governing commercial bank accounts used for CBDCs. As exemplified by the Basel Capital Accords, central banks have a strong tradition and precedent to work together to harmonize cross-border regulation.

## Regulating CBDCs

When used as currencies, CBDCs and stablecoins raise innovative legal issues in addition to the types of legal issues normally associated with money and payment systems (including risk of

loss, counterfeiting, privacy, money laundering and consumer protection), although in novel contexts.

- **Establishing a regulatory framework:** As observed, an account-based retail CBDC could operate through electronic funds transfers using technologies already in place at commercial banks for wholesale electronic funds transfers. To that extent, except insofar as differences between retail and wholesale currencies mandate, it should be regulated similarly to the regulation of wholesale digital funds transfers. The main regulatory difference between retail and wholesale currencies concerns consumer protection.
- **Applying the regulatory framework:** What would it mean for an account-based retail CBDC to be regulated similarly to the regulation of wholesale digital funds transfers? Two primary sources of regulation govern such wholesale transfers. In the United States, they are regulated by article 4A of the Uniform Commercial Code (UCC), and in the European Union they are regulated by the European Directive on payment services in EU internal markets.

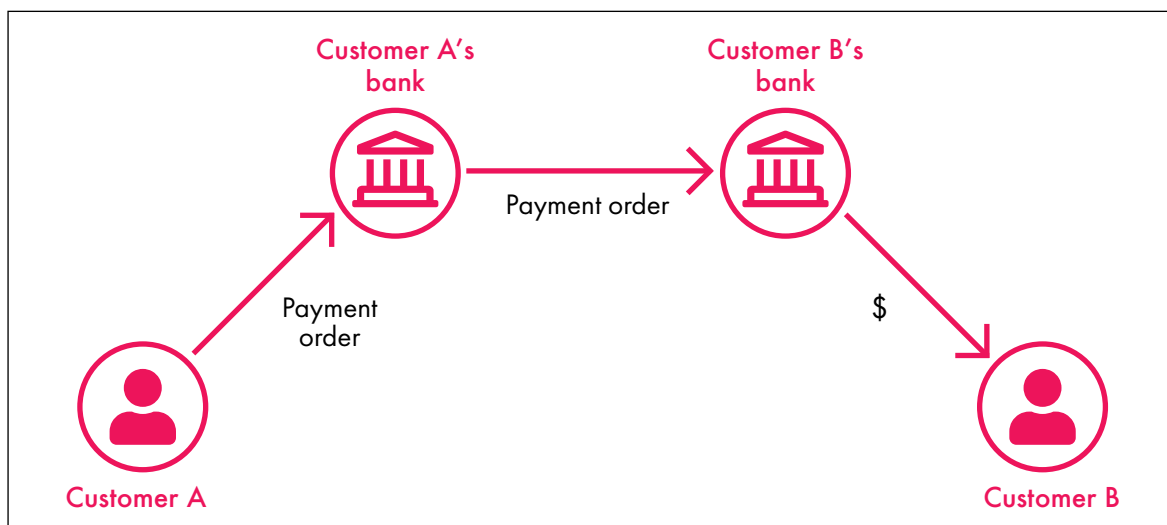
Transferring funds electronically from one customer's bank account to that of another customer should be the same, in principle, whether the transfer is retail or wholesale (see Figure 1). A retail customer would initiate a funds transfer by sending a payment order to their bank; that bank would then (provided its customer's account has sufficient funds) electronically send a payment order through, for example, Fedwire or FedNow to the beneficiary's bank; and the beneficiary's bank would (again, subject to receiving funds) credit the beneficiary's account.

Article 4A, therefore, should apply to an account-based retail CBDC much like it applies to a wholesale digital currency. To that end, article 4A regulates risk of loss and counterfeiting.

- **Risk of loss:** Risk of loss includes at least three risks: mistakenly transferring funds to the wrong person; fraud risk, including fraudulently transferring funds to the wrong person; and credit risk (sometimes called insolvency risk), including the risk of the "receiving bank" paying out before being paid. Article 4A covers all these risks.

<sup>3</sup> But cf. Ricks, Crawford and Menand (2021) (arguing that moving to an account-based retail CBDC would be an opportunity for central banks to make their own accounts more widely available, thereby potentially strengthening the ability of central banks to make monetary policy).

Figure 1: Electronic Funds Transfer



Source: Author.

→ **Counterfeiting:** Traditionally, the counterfeiting risk for money has been concerned with illicit production of physical representations of the money. The protections involve increasing the complexity and markings of bills. These concerns have no obvious parallel for an account-based CBDC.

There are two possible ways to counterfeit an account-based CBDC, although both could also be classified as fraud: by double spending, and by making transfers involving an unverified account. Article 4A covers these counterfeiting risks. It does not compel a bank to process transactions under conditions that might result in double spending, such as when there are insufficient funds in an account. Likewise, it does not compel a bank to process transactions involving an unverified account.

Next, consider how laws governing non-digital forms of money should apply to an account-based retail CBDC, focusing on privacy, money laundering and consumer protection.

→ **Privacy:** CBDCs may help to centralize data about the money supply. There is a long-established privacy interest in protecting individual financial records from government access. Bank-secrecy and other privacy laws will be needed.

→ **Money laundering:** Anti-money-laundering (AML) laws generally set standards and promote

effective implementation of legal, regulatory and operational measures for combatting money laundering, terrorist financing and other related threats to the integrity of the international financial system. If the introduction of a CBDC leaves the commercial banking sector as the retail depository institutions, no change should be needed, *in principle*, to AML laws because the CBDC would not impact existing laws.

*In practice*, though, a retail CBDC might require certain changes to AML laws. For example, these laws impose an obligation on banks to conduct customer due diligence (also known as “know your customer” laws). Requiring banks to scrutinize every retail digital currency transaction would impose high transaction costs due to the sheer volume of those transactions. To reduce these costs, AML laws could place a floor on the value of transfers that would trigger the need to conduct customer due diligence.

→ **Consumer protection:** UCC article 4A was designed for use by relatively sophisticated parties, such as businesses and financial institutions. In the United States, the Electronic Fund Transfer Act (EFTA) governs a range of existing retail digital funds transfers, including ATM deposits and withdrawals and most mobile payment apps.

The primary purpose of the EFTA is consumer protection: to give consumers certain rights when

engaging in digital funds transfers. For example, the EFTA limits consumer liability for unauthorized transactions and ensures that banks adequately inform consumers of their rights (and protects consumers from being forced to waive those rights).

CBDC regulation should draw from both UCC article 4A and the EFTA. It should draw from article 4A to the extent such regulation governs how digital funds transfers should occur — through a series of payment orders between clearly defined parties — and how generally to allocate rights and obligations between those parties. It should draw from the EFTA to the extent regulators regard holders of retail CBDC to need overriding consumer protection.

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## Stablecoins

In contrast to central-bank-sponsored CBDC, stablecoins are privately sponsored and issued. They likely will have a token-based digital form that is secured by cryptography, such as blockchain. As with any other retail digital currency, the main developmental challenges include increasing accessibility (the ability of consumers to have day-to-day access to, and to transfer, the currency); and reducing cost (the ability of consumers to achieve that access and transferability on a cost-effective basis).

Stablecoins also face a third developmental challenge: assuring their stable value by designing reliable redemption rights.

### Developing Stablecoins

Other things being equal, the higher its accessibility and the lower its cost, the more widely used a stablecoin may become. The extent to which other things are equal will turn on that third developmental challenge (that is, assuring the stablecoin's stable value by designing reliable redemption rights).

A stablecoin's value depends on the ability of its holders to exchange their coins for the underlying reference assets, on demand. Any failure of the stablecoin issuer to satisfy such redemption rights, or even the perception that such a failure might occur, would likely lead to a loss of confidence in the stablecoin and a collapse in its value. That

would expose the issuer and stablecoin holders to default risk, similar to the liquidity “run” risk of a bank run — that the issuer might be unable to obtain sufficient reference assets to satisfy correlated demands by stablecoin holders. It also would expose the issuer to valuation risk on the reference asset — the risk that the issuer would have to acquire additional reference assets to satisfy demand at a time when the market price of the reference assets has gone up.

An issuer of a viable stablecoin will need to protect currency holders and itself from these risks. An issuer could attempt to hedge these risks with derivatives, but the derivatives market might not be deep enough to provide that hedge for an affordable price. The issuer could try to collateralize its obligation to exchange the reference asset for the stablecoin, but that could be very expensive. To try to protect against these risks, Facebook's Libra dollars, for example, are expected to be fully backed by a managed reserve of the US dollar reference assets, which could also be expensive. This policy brief will discuss how strategic public-private partnerships could more cost-effectively protect the value of stablecoins that are backed by government fiat currencies.

### Regulating Stablecoins

The basic challenges of regulating stablecoins roughly parallel those discussed in connection with CBDC regulation. These include consumer protection and protecting privacy. Stablecoin regulation also faces the challenge of protecting the right of stablecoin holders to redeem their currencies for the underlying reference assets. Although (as discussed) traditional protections would be expensive, a government might consider mandating a strategic public-private partnership to protect that right — at least where the reference asset for the stablecoin is the government's fiat currency. As part of this partnership, for example, the government might offer the stablecoin issuer some protection against the redemption risk. In return, the issuer might be required to pay a fee, much like the fee that banks pay governments for insuring depositors, and might also be required to cede to the government some control over new stablecoin issuance. The latter would help to protect against the risk that a stablecoin could become so widely used that it would undermine the ability of the government to use its currency to affect monetary, and thus economic, policy. There

are many precedents for government risk-sharing in order to facilitate socially important projects.

Regulation also should address the risk that the protective cryptology underlying stablecoins may fail or be compromised. To protect against this risk, regulators could require stablecoin issuers to back up that cryptology through separate networks.

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## Cross-Border Digital Currency Payments

### Designing Cross-Border Digital Currency Payments

Because payments routinely cross national borders, retail CBDCs and stablecoins should be designed to be used not only domestically but also in cross-border transactions. Retail cross-border payments have been suffering from high costs and inaccessibility. The high costs are due to bank-intermediation fees, the lack of standardization for communicating payment information and the need to coordinate and comply with the laws of multiple jurisdictions. The inaccessibility is due to the fact that not all consumers currently have deposit accounts — a problem that is especially acute for residents of developing countries, who may be poor or remotely located.

Retail CBDCs could help to reduce at least some of these costs. As exemplified by the Basel Capital Accords, central banks have strong tradition and precedent to work together to address inconsistencies in cross-border banking regulation. Because central banks sponsor CBDCs, they likewise should be expected to work together to address cross-border CBDC regulatory challenges.

Using stablecoins and/or token-based CBDCs to make cross-border payments could also help to reduce these costs, as well as increase accessibility — and thus broaden financial inclusion. Stablecoin and token-based CBDC payments generally would be made through peer-to-peer arrangements, which would avoid bank-intermediation fees and eliminate at least some of the need for standardizing the communication of payment information. That also could broaden financial inclusion because

consumers would not need to have deposit accounts to make cross-border payments.

### Regulating Cross-Border Digital Currency Payments

As mentioned, because central banks sponsor CBDCs, they should be expected to work together to address cross-border CBDC regulatory challenges. Stablecoins, however, present more complex cross-border regulatory challenges because they are privately issued. Their central regulatory challenges are to minimize the high cost of coordinating and complying with the national laws of different jurisdictions and to control the risk that cross-border digital currency payments pose to international monetary and financial stability.

When facing that coordination-and-compliance challenge in other contexts, regulators have devised a solution: persuade the relevant jurisdictions to enact, as their national law, a uniform model law. The UCC itself epitomizes such a model law, designed to reduce the high cost of coordinating and complying with the different commercial laws of US states in multi-state commercial transactions. To address that stablecoin cross-border regulatory challenge, this policy brief recommends that a neutral and respected international organization consider drafting a model law proposing uniform text to be enacted into national law by jurisdictions that recognize stablecoin payments.<sup>4</sup>

If widely used, stablecoins also could threaten financial stability both directly and indirectly. Directly, they could impair central banks' ability to control monetary policy by reducing the amount of money over which central banks can exercise such policy. Regulation could help to protect against this direct threat by implementing the type of public-private partnership discussed above that cedes some control over new stablecoin issuance to the government.

Indirectly, the threat to financial stability would depend on whether the stablecoin is used for payments or as a common store of value. In the former case, an operational disruption in the stablecoin arrangement might significantly affect the payment system. Regulation could

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<sup>4</sup> The author of this policy brief is currently analyzing how to accomplish that. See Schwarcz (n.d.), which examines how such a uniform model law could be drafted and enacted.



help to protect against this threat by requiring the stablecoin infrastructure to include secure hardware technology as well as additional security mechanisms along with cryptographic protections. If stablecoins are widely used as a common store of value, fluctuations in value could affect spending decisions and the real economy. That impact could be especially significant in economies with weak fiat currencies, if stablecoins become a more dominant store of value. The type of public-private partnership discussed above could protect against fluctuations in value by assuring redemption rights. Regulation could also help to protect against adverse confidence effects by authorizing systemically important stablecoin issuers and market-makers to gain access (for appropriate fees) to central bank reserves, much as central banks provide to domestic banks within their reserve system.

## Supervising Cross-Border Digital Currency Payments

It is also important to consider how to supervise cross-border digital payments, taking into account that multiple jurisdictions may be involved. Because central banks sponsor and control CBDCs, they would be the logical supervisors — presumably with the central bank sponsoring a given CBDC being its primary supervisor.

Because stablecoins can present a real threat to monetary and financial stability, there may well be a need for an international body to supervise cross-border stablecoin payments. A multi-governmental organization could analyze how best to internalize the risk of cross-border stablecoin payments to protect international monetary and financial stability. Such a supervisory body might be modelled, for example, on the Financial Action Task Force, the inter-governmental body that produces best-practice recommendations for combatting money laundering and terrorist financing.

The preliminary view of the Group of Twenty-sponsored Financial Stability Board (FSB) about how globally used stablecoins should be supervised does not contemplate an international supervisory body. Rather, the FSB contemplates that the stablecoin's lead national regulator would coordinate (through ad hoc agreements, such as memorandums of understanding) with the relevant national authorities in other jurisdictions that recognize the stablecoin as legal currency.

Such informal intergovernmental coordination could work, but it might not optimally serve to monitor and assess threats to monetary and financial stability that go beyond the concerns of the national regulator's jurisdiction.

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## Conclusion

A significant portion of the currency transfers among businesses and financial institutions already occur digitally, without the need for cash. The next generation of cashless currency transfers will be retail, involving consumers. The use of stablecoins and/or token-based CBDCs could help to reduce the high costs and improve the inaccessibility often associated with retail cross-border payments, as well as increase financial inclusion.

This policy brief has examined and critiqued these evolving types of retail digital currencies and also analyzed how they should be regulated and supervised. Because digital currency payments regularly cross national borders, retail CBDCs and stablecoins should be designed to be used both domestically and in cross-border transactions. To reduce the possibility of inconsistent treatment, central banks should work together to address cross-border CBDC regulatory challenges, taking advantage of their strong cooperative tradition and precedent to coordinate their rules and regulations. Two existing sources of regulation, UCC article 4A and the EFTA, could guide CBDC regulation.

Stablecoins present more complex cross-border regulatory challenges because they are privately issued. The promulgation of a uniform model law could help to minimize the high cost of coordinating and complying with the national laws of different jurisdictions, as well as to control the risk that cross-border stablecoin payments could pose to international monetary and financial stability. Strategic public-private partnerships also could help protect the value of stablecoins that are backed by government fiat currencies in a cost-effective way, while regulators could protect against the risk that the protective cryptology underlying stablecoins may fail or be compromised by requiring stablecoin issuers to back it up through separate networks. Also, an international body — perhaps one sponsored by a multi-governmental organization — could be valuable in helping to supervise cross-border stablecoin payments.

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