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TIMELY INSIGHTS AND OBSERVATIONS
FROM THE OCC'S CHIEF ECONOMIST

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Will Fractional-Reserve Stablecoin Banking Replace Bitcoin and Some Traditional Banking Payments?

Bitcoin is reaching stratospheric prices, rising from about \$8,000 in January 2020 to above \$35,000 in January 2021. The outstanding supply of stablecoins is growing even faster, rising from \$3 billion in January 2019 to \$30 billion in January 2021.¹ The institutional and legal foundations of crypto banking and finance are evolving rapidly too. For example, the Office of the Comptroller of the Currency (OCC) recently issued several interpretive letters that clarify how the federal banking system interacts with the new world of crypto assets and blockchain networks.² If you are not already an expert on all things crypto, you may find the breadth of change the financial system is undergoing a bit challenging to understand.

It is not possible to address all of this in a blog, but sometimes a little economics can help sort out long-term meaning amidst the frenzy of innovation and change. This blog entry will think through some often-neglected basics by addressing three fundamental questions. First, why does Bitcoin have value now, and what will determine its long-run value? Second, what is a stablecoin and what are its long-run prospects as a medium of exchange? Third, what will the banks of the future that issue stablecoins look like?

I make myself unpopular among Bitcoin enthusiasts when I voice my opinion that eventually the value of Bitcoin likely will fall dramatically. The logic driving that forecast is simple. Bitcoin's current value reflects two facts: it was the first to develop a network of users, and it therefore remains uniquely effective for accomplishing certain transactions. But Bitcoin has no intrinsic value. Eventually, as competing coins arise that can accomplish the same transactions better, Bitcoin will lose its unique competitive position. Given that it has no intrinsic or derivative value, as competitors replace it, its value likely will fall.

¹ See <https://www.theblockcrypto.com/data/open-finance/stablecoins>

² Most recently, on January 4, 2021, the OCC issued Interpretive Letter 1174, available at <https://www.occ.gov/news-issuances/news-releases/2021/nr-occ-2021-2a.pdf>, titled "OCC Chief Counsel's Interpretation on National Bank and Federal Savings Association Authority to Use Independent Node Verification Networks and Stablecoins for Payment Activities."

What do I mean by intrinsic and derivative value? Gold coins have intrinsic value because people use gold for various purposes, such as jewelry. Confused commentators say that Bitcoins are just like dollars because both have no intrinsic value, but these commentators are missing something important. The dollar has derivative value that comes from something intrinsic. It is the only object that can be used to pay your taxes. Your taxes have real intrinsic value (they are a fraction of your income), and so, as Adam Smith pointed out in *The Wealth of Nations*, the unique usefulness of fiat currency to pay your taxes is sufficient to give fiat money value.³

Bitcoin is unlike both gold coins and paper dollars. It is not linked to any real value, either intrinsically (like gold coins), or derivatively (like paper dollars that pay taxes). So why does Bitcoin have any value today? At the moment, it has value because as a first mover in establishing a network of trading with unique capabilities, Bitcoin has unique uses, which confers a temporary quasi-monopoly status.⁴ If you want to get money to your relatives in Venezuela, buying Bitcoin, transferring it to them, and having them sell the Bitcoin and convert it back into currency accomplishes something that otherwise may be difficult to accomplish.

Note that when you send Bitcoin to your relatives in Venezuela, neither you nor your relatives probably hold the Bitcoin for long. The ups and downs of the price of Bitcoin do not discourage you from using it for this purpose because the price is not likely to move much over the hour it takes to complete your transactions. Neither you nor your relatives hold Bitcoin as a substitute for your checking account or for the cash you carry in your pocket. People who hold Bitcoin for long periods of time are holding it for speculation, not to serve as a “transaction balance.”

The reason I believe Bitcoin likely will not retain its value in the long run is that there are new cryptocurrencies competing with Bitcoin and expanding their networks of participants rapidly. Bitcoin’s first-mover network advantage eventually will disappear because it is not the best cryptocurrency transaction technology, just the first. Many of those new coin issuers are issuing stablecoins, which means that the coins keep a nearly constant long-term value. Although people do not use Bitcoin as a substitute for their cash and checking account balances, they can use stablecoins for that purpose because they retain a reliable amount of purchasing power for transactions over the next weeks or months. That is why a growing number of people are willing to cash out their bank checking account and transfer the balance to a stablecoin account from which they can execute transactions. This implies that stablecoins, used through a decentralized blockchain network, are likely not only to replace Bitcoin, but also to replace a significant part of the current centralized network that clears checking account transactions (see [Calomiris 2020](#) for a summary of the various advantages of this alternative payments network).⁵

What will the stablecoin issuers of the future look like? In my opinion, they will not look much like today’s stablecoin issuers. Today, stablecoin issuers generally provide a very simple service: they hold cash assets (often equal to 100 percent of their coins) and maintain

³ Adam Smith, *The Wealth of Nations*, Edwin Canaan, ed. (New York, 1937), p. 311. A proof of Smith’s proposition in the context of the dollar today would proceed as follows: The rate at which money can be turned over (number of times a given dollar can be used to make a payment per day, which is also known as velocity) is technologically limited to a finite number (it cannot be infinity). If there is a given amount of dollars outstanding (saying \$D) and an amount of taxes that must be paid to the government each month of \$T, then for a non-infinite velocity, the dollar will have value because it is the only way to pay your taxes.

⁴ For a formal model of how first-mover network advantages can create value, see Nick DeRobertis, “Valuation without Cash Flows: What Are Cryptoasset Fundamentals?” Working Paper, University of Florida, available at <https://nickderobertis.com/research>

⁵ Charles W. Calomiris (2020), “Chartering the FinTech Future,” *Cato Journal*, forthcoming.

convertibility of the stablecoins into dollars or other fiat currencies on demand. They earn a small profit from the spread between the cash assets they hold and the coins they issue (which pay lower interest than the rate they earn on the assets).

This very narrow business model has important limitations. First, the issuers create little economic value. They just aren't doing very much. As I will show, that lack of value creation also constrains them to have to hold cash equal to the amount of their outstanding coins, which limits the aggregate amount of stable-value coins that can be created.

I believe that, in the future, stablecoins will be issued by fractional reserve banks that also create value through innovative payments services. The fee income derived from those services will allow them to maintain the stable value of their coins while reducing their ratio of cash assets to coins to less than 100 percent. The future stablecoin bank also will be able to maintain coin value stability without having to offer convertibility of its coins into cash on demand (which is costly and unnecessary to create stable value). To see how all this is possible, consider the following example, which is discussed in greater detail in my longer paper, referenced above. I emphasize that this is only an example. There are many potential variants of how such a fractional-reserve stablecoin bank could operate. The point of this example is to show that a non-depository stablecoin can be issued in a safe and sound manner by a fractional reserve bank, without offering convertibility into cash, and that this could have substantial efficiency, convenience, and stability advantages, if it were designed properly.

Imagine a bank that issues a quantity (S) of stablecoins, selling each coin it issues for \$1. The coins can be used to transact in goods and services through blockchain clearing (i.e., through gross real-time settlement at nearly the speed of light). The bank maintains a secondary market in its coins. Specifically, it commits contractually to buying coins whenever their value per coin falls to \$0.99 at that price and selling coins whenever their value rises to \$1.01 at that price. It does so automatically and is able to do so without risk. The secondary market purchase and sale policy is contractually credible and executed automatically by an algorithm. There is no redemption option for the coins and they never mature. The coins are effectively a kind of (riskless) perpetual preferred stock in the bank.

Because the bank operates in a competitive environment and has near zero physical costs, the bank contractually commits to paying interest on the coins at just below the U.S. Treasury bill rate. The bank's tangible assets consist of cash assets ($\$C$) in the form of U.S. Treasury bills. I also assume that the bank possesses an intangible asset equal to the present value of the fees it earns from executing payments ($\$F$). These fees are the main source of value creation by the bank. $\$F$ is the discounted value of the expected stream of earnings from fees. $\$F$ varies over time; the arrival of news about changing transactions demand affects $\$F$. The lower support (lowest dollar value) of $\$F$ is $\$F'$. The value of the bank's equity ($\$E$) at any moment in time, owned by its common shareholders, is given by $\$E = \$F + \$C - \S .

Can the bank reduce the amount of tangible cash assets it holds to an amount less than $\$S$ by paying a dividend to its stockholders without creating the possibility of a failure to maintain a riskless stablecoin equilibrium?⁶ Yes, if there is a known lower bound to $\$F$ equal to $\$F'$, then the bank can pay out some of its cash assets as a dividend. To maintain a riskless commitment that keeps stablecoins at the value of \$1, the bank just has to maintain cash assets $\$C$ such that $\$C + \$F' = S$. Note that this implies a form of riskless fractional reserve banking. The bank

⁶ In this model, the bank can also pay all of the transaction fees it earns per period out as dividends without running the risk of failing to maintain the \$1 value of its stablecoins.

can also pay all the transaction fees it earns per period out as dividends without running the risk of failing to maintain the \$1 value of its stablecoins.

Note that because the bank does not rely on deposit funding and does not offer a first-come first-served rule for redeeming its coins, it cannot experience a run. Coin holders see no advantage to being first in line to sell their coins in the secondary market.

Is it realistic to imagine that coin holders would demand these stablecoins rather than deposits in a conventional bank? Yes, for several reasons. First, this bank has nearly zero overhead costs, so it is able to offer a higher interest rate on coins than depository banks can offer on insured deposits, which are similarly riskless. Second, the coins are more useful than deposits. A payment can be made with instant finality and can be accompanied by a message that assists in executing the transaction, which is the service that accounts for the fees charged for payments.

Stablecoin producers already are creating novel services that facilitate transactions, which will further increase demand for their coins as a medium of exchange. For example, if the purchaser wishes to convey selective information about himself during a transaction, he or she can do that credibly by using verification procedures through the blockchain. A purchaser may wish to convey that he or she is older than 18 years so that he or she can engage in gambling online, or the purchaser may want to convey his or her U.S. state of residence so that he or she can pay sales taxes on the transaction.

In summary, a payments system founded on sound business models for stablecoins, operating via a decentralized blockchain network, would reduce transaction costs, increase payment speed, raise interest paid on accounts, and allow new services (such as the communication of information about the payer) to be provided efficiently. Although it is beyond the scope of this blog, in my aforementioned article I showed that clearing through this decentralized network likely would also lower systemic risk, reduce hacking risk, and reduce the use of the payments system to foster criminal activity.

Should the OCC and state banking authorities charter stablecoin banks like these? My analysis here contributes to the argument in favor of the view that it would be desirable to allow such banks to obtain national bank charters. By chartering them, we allow banks' customers to gain from credible examination of their algorithms, and accounting and managerial skills. By encouraging shadow banks of all kinds (including stablecoin banks) to join the chartered system, examination can ensure that consumers are not taken advantage of by unscrupulous, dishonest, or misleading practices. The government would also gain because examination would ensure that the bank's algorithms comply with laws against money laundering and tax evasion, and that its accounting is honest. Chartering stablecoin banks also extends the OCC's view of potential systemic risks by giving it greater insight into this large and growing sector.

Will some stablecoin banks be willing to join the ranks of chartered banks? I think so. First, they would reap the advantages from having examinations help them build market credibility for their algorithms and managerial practices. And a national bank charter, in particular, helps banks to expand their market reach across state lines. Finally, stablecoin banks, like other banks whose business models do not require that they fund themselves with deposits, will be able to reap those advantages while avoiding some of the regulatory apparatus that makes traditional banking more costly.