FROM TETHER TO TERRA: THE CURRENT STABLECOIN ECOSYSTEM AND THE FAILURE OF REGULATORS

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ABSTRACT

The Tether controversy and Terra crash have placed stablecoins in the regulatory spotlight. Stablecoins are often portrayed as posing systemic risks to financial markets, with some pundits labelling them “the villain of the finance world.” Global regulatory bodies, namely the International Monetary Fund (IMF) and the Bank of International Settlement (BIS), and political leaders, including the Biden Administration, have all called for stablecoin regulation. These officials allege that stablecoins’ structure, combined with their exponential growth, pose a unique risk to global markets. Before the May 2022 Terra crash, government reports superficially treated stablecoins by exclusively focusing on asset-backed coins. Post hoc, regulatory reports treated Terra’s collapse as inevitable, using the failure as an opportunity to push for a central bank digital currency (“CBDC”) in the United States.

Whether stablecoins should be regulated is not up for debate. Their regulation is imminent. Yet, how stablecoins should be regulated and if CBDCs can be an adequate replacement is another matter. In the words of the Commodities Future Trading Commission’s (CFTC) Dawn Stump: “As financial markets evolve and adapt to new demands, market regulators must not stifle beneficial innovations by clinging rigidly to regulatory approaches of the past that may no longer be fit for purpose.”

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Stablecoins are creatures of evolution. That is to say, stablecoins not only fill a niche created by other digital assets, but their advent has further allowed the digital asset space to mature. Consequently, in order to understand stablecoins, it is necessary to grasp the development of digital assets generally.

To start, Bitcoin emerged in 2009 from Satoshi Nakamoto’s now famous paper *Bitcoin: A Peer-to-Peer Electronic Cash System.* Then, in 2012, J.R. Willett started a new era of “cryptoeconomics” by creating a coin on top of Bitcoin, and launching the first initial coin offering (“ICO”), Mastercoin (now Omni). This led to the ICO boom from 2018.
to 2019. However, the boom featured frauds and hacks that left investors without legal recourse.

In response to these scams and their corresponding Securities and Exchange Commission (SEC) enforcement actions, as well as scalability problems and a general aversion to new technologies, the cryptocurrency market became exceedingly volatile. This volatility was made worse by

3. See Cryptopedia Staff, *Ethereum and the ICO Boom*, GEMINI: CRYPTOPEDIA (May 27, 2021), https://www.gemini.com/cryptopedia/initial-coin-offering-explained-ethereum-ico - section-initial-coin-offerings-on-ethereum [https://perma.cc/4453-5LCW]. ICOs were a popular crowdfunding vehicle between 2017 and 2018, raising over 10 billion USD. Id. ICOs allow companies to raise capital without going through the traditional IPO process. See *ICOs vs. STOs vs. IPOs in Crypto: Key Differences Explained*, COINTELEGRAPH, https://cointelegraph.com/funding-for-beginners/icos-vs-stos-vs-icos-in-crypto-key-differences-explained [https://archive.ph/6ZhUX] (last visited, Oct. 25, 2022). Developers sell tokens for money, and, unlike IPOs, token-holders do not hold equity in the company. Id. Instead, the holders use these tokens on the blockchain or decentralized application (“dApp”) that they fund. Id. See also the statement of former SEC chairman Jay Clayton:

A number of concerns have been raised regarding the cryptocurrency and ICO markets, including that, as they are currently operating, there is substantially less investor protection than in our traditional securities markets, with correspondingly greater opportunities for fraud and manipulation. . . . Please also recognize that these markets span national borders and that significant trading may occur on systems and platforms outside the United States. Your invested funds may quickly travel overseas without your knowledge. As a result, risks can be amplified, including the risk that market regulators, such as the SEC, may not be able to effectively pursue bad actors or recover funds.


5. See Dell’Erba, supra note 1, at 3-4. According to Ted Livingston, CEO of Kik Interactive, a private cryptocurrency company charged with violating securities law for its ICO, the SEC’s enforcement actions have exported innovation to more welcoming nations. See Ted Livingston, *Moving Forward Boldly with Kin*, MEDIUM (Sept. 23, 2019),
cryptocurrencies structural characteristics: traditional cryptocurrencies are not backed by assets, are not any institution’s liability, and face no rigid issuance rules. In response, stablecoins developed in 2014 as a less volatile alternative.

The purpose of a stablecoin is to solve cryptocurrency’s volatility problem by holding a constant value. Thus, the coins act as a store of value, a medium of exchange, and a unit of account. The first stablecoin was BitUSD, launched in 2014 by BitShares. Projects then developed in North America, Europe, Asia, the Middle East, and Oceania, making the market value grow by 700 percent in 2018. In 2018, Tether, also established in 2014, accounted for 93 percent of the stablecoin market value.

2020 was the year of Decentralized Finance (“DeFi”). DeFi takes control away from traditional third-party financial institutions and allows consumers and merchants to transact directly with one another via

https://medium.com/@tedlivingston/moving-forward-boldly-with-kin-ec6290a6453

After 18 months of working with the SEC the only choice they gave us was to either label Kin a security or fight them in court. Becoming a security would kill the usability of any cryptocurrency and set a dangerous precedent for the industry. . . . [T]he SEC [is] working to characterize almost all cryptocurrencies as securities . . . .

Id.; see also Dell’Erba, supra note 1, at 3-4.
7. See id. at 5; see also BitMEX Research, A Brief History of Stablecoins (Part 1), BitMEX (July 2, 2018), https://blog.bitmex.com/a-brief-history-of-stablecoins-part-1/[https://perma.cc/VRB4-BZF5].
8. See Dell’Erba, supra note 1, at 5.
9. Id.
11. Dell’Erba, supra note 1, at 5.
12. Id. at 5-6.
blockchain. For instance, decentralized finance applications (“dApps”) allow users to trade, lend, or borrow assets. The first DeFi protocol, MakerDao, launched in 2017 and allows users to borrow a stablecoin, Dai, against Ether, Ethereum’s native cryptocurrency, as collateral. This dApp thus allows users to take out a loan without relying on a bank or other centralized entity.

Today, DeFi protocols allow users to lend out their crypto and earn interest, trade crypto assets through an exchange, save their crypto through a savings account alternative, and buy derivatives of other cryptocurrencies. DeFi and stablecoins work in tandem; stablecoins act as crucial facilitators in dApps by providing a means of fixed payment through blockchain technology. So, DeFi’s expansion and stablecoins’ market growth are not merely correlative, but causative. 2017 was the first year of dApps. By December 2018, the total value locked (“TVL”) of DeFi was around $300 million. The end of 2020 saw a TVL of approximately $15 billion.

While the stablecoin market continues to grow, regulators have been unable to keep up. So far, the SEC has generally used unclear, post hoc, regulation by enforcement in the crypto sphere, forcing companies “to pick through the breadcrumbs of the SEC’s filed actions in an attempt to

17. Id.
23. Id.
best ensure compliance.” Moreover, the current federal and state regulatory landscape is a patchwork. There is not even a uniform definition for “cryptocurrency” across jurisdictions.

More recently, the proposed bipartisan stablecoin bill from Senators Cynthia Lummis (R-WY) and Kirsten Gillibrand (D-NY) continues the larger trend of looking to central bank digital currencies (“CBDCs”) as a replacement to stablecoins. However, the two are incongruent, and a regulation seeking to replace stablecoins with CBDCs seems likely to have limited impact. The bill moreover proposes that stablecoins be 100 percent backed by reserve-like assets, such as Treasuries or dollars, and include detailed disclosure requirements. This proposal, however, would contract the stablecoin market to only one type of stablecoin, fiat-backed, discussed in detail later. Additionally, according to Waters and


28. See Schonberger, supra note 27.
McHenry, the impetus behind the bill is the President’s Working Group report (“PWG Report”).

Regulators have so far published substandard reports while Congress has proposed reactionary laws that shoehorn a uniquely complicated market into a conventional mold. The government should instead focus on coalescing research and experts’ views to fully understand the field, and only then pass appropriate legislation.

Part I of this Note identifies stablecoins’ categories, their problems, and uses. Part II addresses the paper Taming Wildcat Stablecoins, written by Yale Economist Gary B. Gorton, Yale Economist, and Michigan Law School Professor Jeffery Zhang. This Note challenges their argument that stablecoins are the modern iteration of the 19th century private bank notes. This Note then argues that CBDCs are an inadequate replacement to stablecoins.

Part III looks at demand deposit accounts (“DDA’s”) and compares them to the different stablecoin categories. DDAs are similar to one type of stablecoin issuer. Ultimately, this Note suggests that stablecoins should not be regulated as DDAs are, as the two are distinct vehicles.

Part IV examines money market funds (“MMF”s) and studies their similarities to stablecoins generally. While one stablecoin issuer is similar to a MMF, this Note draws the same conclusion as in Part III: broadly

29. Sutton, supra note 27. Senator Pat Toomey’s bill, the Stablecoin Transparency of Reserves and Uniform Safe Transactions Act (“TRUST Act”), similarly constricts the stablecoin landscape by regulating asset-backed stablecoins. See Andrew Olmem & Ellen L. Aldin, Senator Toomey Releases Stablecoin Regulation Legislation, MAYER BROWN (Apr. 28, 2022), https://www.mayerbrown.com/en/perspectives-events/publications/2022/04/senator-toomey-releases-stablecoin-regulation-legislation [https://perma.cc/VP4F-JBS7]. While this proposal might seem to include other asset-backed coins, in practice it is nearly as exclusive as the Lummis and Gillibrand bill. Id. Specifically, the proposed bill includes that an issuer must maintain reserve of “100 percent of the par value of outstanding payment stablecoins in cash, cash equivalents, or level 1 high-quality liquid assets (as currently defined under federal regulation) denominated in US dollars.” Id. However, this would not include any cryptocurrency. Id.; see also Anwar Hasan Abdullah Othman et al., Are the New Crypto-Currencies Qualified to be Included in the Stock of High Quality Liquid Assets? A Case Study of Bitcoin Currency, J. ISLAMIC THOUGHT & CIVILIZATION INT’L ISLAMIC U. MALAY, (Oct. 2019), https://www.researchgate.net/publication/336313181_Are_the_New_Crypto-Currencies_Qualified_to_be_Included_in_the_Stock_of_High_Quality_Liquid_Assets_A_Case_Study_of_Bitcoin_Currency.
speaking, stablecoins and MMFs are distinct creatures and stablecoins should be regulated differently.

This Note concludes that stablecoins’ unique use and significant varieties do not fit into traditional regulations. This Note suggests that federal authorities should regulate stablecoins after considering the unique problems they create and risks they pose. More specifically, the issuance of CBDCs is likely an inadequate solution. And shrinking the stablecoin market to only fiat-backed coins could stifle innovation and limit economic opportunities.

I. WHAT ARE STABLECOINS?

A. PURPOSE

The cryptocurrency market is undoubtedly volatile. This volatility limits cryptocurrency’s capacity to act as a means of exchange—its intended purpose. Because some major exchanges did not permit bank transfers or other kinds of fiat money on their platform, stablecoins developed to allow traders to convert erratic digital currencies instantaneously, securely, and privately to a form that maintained a constant value.

Stablecoins are crypto tokens designed to maintain a constant par price to a reference asset. The most recognized stablecoins are pegged


31. See generally NAKAMOTO, supra note 1 (at least as pertains to Bitcoin, the first cryptocurrency).


to the value of a fiat currency, such as the U.S. dollar (USD). Tokens can also be pegged to other types of reserve assets, such as a cryptocurrency or a commodity. A coin can also be backed by algorithmic mechanisms that manage the token supply to keep the market price at approximately one dollar.

B. TAXONOMY

There are three main categories of stablecoins: asset-backed stablecoins, on-chain collateralized stablecoins, and non-collateralized stablecoins. This taxonomy reveals that the stablecoin ecosystem is diverse.

1. Asset-Backed Stablecoins

a. Fiat-Backed Stablecoins

Fiat-backed stablecoins hold a value that is directly linked to an external, reference currency, such as one USD. They are also known as tokenized funds or true stablecoins. When a user or third party gives the issuer fiat currency, the issuer mints the equivalent amount in tokens. To maintain the value of the coin relative to the reference currency, the issuer holds assets to back its redemption obligation (a holder’s right to

36. See Lee, supra note 35.
38. Id.
39. Id.
redeem units of the stablecoin at par).\textsuperscript{40} Ideally, reserve assets are denominated in the reference asset’s currency, always remain liquid, and incur only minor losses in a run or in a distressed market.\textsuperscript{41}

Of note, fiat-backed stablecoin issuers do not follow a standard transparency policy on the makeup of their reserve assets.\textsuperscript{42} Based on available information, issuers differ in their reserve assets’ riskiness: assets range from deposits at insured depository institutions and treasury bills, to commercial paper and corporate and municipal bonds.\textsuperscript{43} Legislators have placed this concern at the forefront of proposed regulations.\textsuperscript{44}

Finally, the President’s Working Group’s November 2021 Report on Stablecoins only examines fiat-backed stablecoins.\textsuperscript{45} Before the government promulgates any regulation, it is pivotal that it considers the entire stablecoin market.\textsuperscript{46}

i. Fiat-Backed Stablecoin Examples: Tether and Circle

One of the most infamous stablecoins, Tether (“USDT”), is a fiat-backed stablecoin.\textsuperscript{47} Tether tokens are created after the equivalent fiat
reserve is placed into Tether’s reserves. However, coins are typically acquired through exchanges. Tether works on multiple blockchains, with transfers taking from 2 to 40 minutes, depending on the blockchain.

Tether is one of the more controversial stablecoins. First, Tether was hacked in 2017, losing $31 million worth of tokens. In 2018, the company parted with its audit firm, having never performed its audit to ensure adequate reserves, and was then issued a subpoena by regulators. The next year, the New York Attorney General (“NYAG”) accused Tether’s parent company, iFinex Inc., of hiding a $850 million loss of co-mingled client and corporate funds and taking at least $700 million from cash reserves to hide the missing money. In fact, the NYAG settlement reveals that Tether had only 2.9 percent of its backing funds in cash. And again in 2021, the U.S. Commodity Futures Trading Commission (“CFTC”) found that, since 2019, the organization had misrepresented that it had sufficient U.S. dollar reserves to back every USDT in circulation, never disclosed that it included unsecured receivables and non-fiat assets in its reserves, and falsely represented that it underwent routine and professional audits.

50. Id.
53. Stankiewicz, supra note 46; see also Frankenfield, supra note 51.
55. See Frankenfield, supra note 51; Stankiewicz, supra note 46; Press Release, Commodity Futures Trading Comm’n, supra note 46.
Tether has since settled with NYAG and the CFTC.\textsuperscript{56} These settlements emphasize regulators’ focus on transparency. Now, Tether is relatively transparent with its reserves.\textsuperscript{57} To start, there is a public record of the deposits and withdrawals on Tether’s bank account because its ledger is embedded in the Bitcoin blockchain via Omni.\textsuperscript{58} Furthermore, Tether has a proof of reserve system (“PoR”) on its website; this consists of a daily record of USDT’s balances and reserves.\textsuperscript{59} Thus, these settlements represent a positive trend in regulatory action. And they have caused a broader market impact in that other fiat and asset-backed stablecoins maintain a transparent reserve policy.\textsuperscript{60}

Circle’s coin, USDC, is the second largest stablecoin, is also fiat-backed, and has a market cap of approximately $52.4 billion.\textsuperscript{61} Rather than become compliant through enforcement actions, Circle partners with established financial institutions and works with regulators to remain compliant.\textsuperscript{62} More specifically, in August 2021, Circle announced its commitment to full-reserve banking under the auspices of the Federal Reserve, the U.S. Treasury, the Office of the Comptroller of the Currency, the U.S. Treasury, and the Federal Reserve.\textsuperscript{63}

\begin{footnotesize}
\begin{enumerate}
\item Stankiewicz, supra note 46 (“As part of the settlement, Bitfinex and Tether agreed to pay $18.5 million, cease trading with New York residents and entities, and will provide quarterly transparency reports to the NYAG. As part of the settlement, Bitfinex and Tether neither admit or deny any of the NYAG’s findings.”); see Press Release, Commodity Futures Trading Comm’n, supra note 46 (“The order requires Bitfinex to pay a $1.5 million civil monetary penalty. It also prohibits Bitfinex from further violations of the CEA, as charged, and requires Bitfinex to implement and maintain additional systems reasonably designed to prevent unlawful retail commodity transactions.”).
\item See TETHER WHITEPAPER, supra note 48, at 5.
\item See id. at 9-13.
\item See Sam Reynolds, Tether’s Settlement With the NYAG a ‘Positive’ For Industry, BLOCKWORKS (Feb. 24, 2021), https://blockworks.co/tethers-settlement-with-the-nyag-a-positive-for-industry/ [https://perma.cc/R7TW-TCG3] (“In a worst case scenario, Tether would have been forced to shut down, which could have had a cascading effect on the broader market.”).
\item See Benson, supra note 61.
\end{enumerate}
\end{footnotesize}
and the Federal Deposit Insurance Corporation. The company protects its reserves by holding its assets in separate accounts, labeled for the benefit of USDC holders. Circle cannot consequently lend, borrow against, or use its reserves.

As of February 2022, Circle’s share of the stablecoin market grew to approximately 30 percent. Circle’s growth can largely be attributed to trust: the market views Circle as a conservative company that adheres to the law, while Tether has made misleading statements about their reserves and has faced numerous regulatory issues. Circle’s growth of market share (at Tether’s expense) is a case for ex-ante regulations. The market has indicated its predilection for issuers that respect the law. Now, regulators must provide the law in order for issuers to respect it.

b. Commodity-Backed Stablecoins

Commodity-backed stablecoins, also known as off-chain collateralized stablecoins, are backed by physical asset classes. These include commodities, such as precious metals, oil, and real estate. One coin is typically worth one unit of the referenced commodity; for instance, one ounce of gold or one barrel of oil. These stablecoins give investors


65. See id.

66. See Oluwapelumi Adejumo, Circle’s USD Coin is silently closing the gap to Tether, CRYPTOSLATE (Feb. 1, 2022), https://cryptoslate.com/circles-USD-coin-is-silently-closing-the-gap-to-tether; see also In Winning DeFi, Circle’s USDC Shows It Can Be the No. 1 Stablecoin, supra note 54. As of January 2022, USDC’s market capitalization was $45.4 billion and USDT’s was $78.4 billion. Id.

67. See supra Section I.B.1.a.


69. See What Are Stablecoins?, supra note 68.

70. 3 Things to Know About Stablecoins, FINRA (Apr. 17, 2020), https://www.finra.org/investors/insights/3-things-stablecoins [https://perma.cc/5PFU-WDXT].
greater exposure and liquidity to physical assets that may be locally inaccessible. However, these types of tokens do require a centralized custodian for the asset’s safekeeping.

Redemption rights vary across tokens. Only some commodity-backed stablecoins allow holder redemption of the underlying asset. For example, gold-backed stablecoins, like Digix Gold (“DGX”) offer redemption in physical gold or a fixed amount of the fiat currency’s worth of the commodity. This is called fixed redemption. Other coins have variable redemption rights: the holder receives their portion of the issuer’s total commodity reserves at the time of redemption.

The most popular collateralized commodity is gold: Tether Gold (“XAUT”) and Paxos Gold (“PAXG”) are the most liquid gold-backed coins. Both stablecoins allow users to redeem their tokens for physical gold in Switzerland and England respectively.

Commodity-backed stablecoins can also be pegged to a bundle of currencies and/or commodities. Theoretically, this would help to insulate the commodity-backed stablecoin against shocks, since commodity prices fluctuate more than fiat currencies. Still, if some of the underlying assets in the batch are volatile, then the peg can waver. This might explain why there are more fiat-backed than commodity-backed coins.

Finally, commodity-backed stablecoins share some of the problems that fiat-backed stablecoins do. Both coins are centralized, as they depend on a custodian to manage the collateral or reserves and issue new
stablecoins.\textsuperscript{81} Therefore, reserve holdings may be stated inaccurately, which could impact the token’s value.\textsuperscript{82}

2. On-Chain Collateralized Stablecoins

On-chain collateralized stablecoins are backed by a cryptocurrency or a basket of cryptocurrencies.\textsuperscript{83} These stablecoins exist on the blockchain, usually Ethereum, and therefore employ smart-contracts instead of a central issuer.\textsuperscript{84} A smart contract is a digital contract—that is stored on a blockchain, typically Ethereum, and is automatically executed when predetermined terms and conditions occur.\textsuperscript{85} The smart contract’s terms are governed by governance token holders, who vote via the blockchain.\textsuperscript{86} For example, the governance token holders determine what kind of cryptocurrency will be accepted as collateral.\textsuperscript{87} So, in order to mint an on-chain collateralized stablecoin, a user locks-in a cryptocurrency (that the governance token holders will accept via the smart contract’s terms) into the smart contract.\textsuperscript{88} Then, the smart contract gives the user stablecoins of equal representative value.\textsuperscript{89} A user can, of course, put their stablecoin back into the same smart contract to withdraw their original collateral.\textsuperscript{90}

Finally, these stablecoins are over- collateralized, so that the reserve value – the cryptocurrency that acts as collateral - is larger than the amount of outstanding stablecoins.\textsuperscript{91} This limits the coin’s potential volatility.\textsuperscript{92} MakerDao’s DAI is a prominent stablecoin in this category and makes for a suitable case study.

\textsuperscript{82} See 3 Things to Know About Stablecoins, supra note 70.
\textsuperscript{83} See Dell’Erba, supra note 1, at 10.
\textsuperscript{84} What Are Stablecoins?, supra note 68.
\textsuperscript{87} See id.
\textsuperscript{88} What Are Stablecoins?, supra note 68.
\textsuperscript{89} Id.
\textsuperscript{90} Id.
\textsuperscript{91} 3 Things to Know About Stablecoins, supra note 70.
\textsuperscript{92} Id.
MakerDAO issues DAI stablecoins and Maker (MKR) governance tokens on Ethereum. DAI is designed to maintain a dollar value. The MakerDAO Protocol also uses a web of smart contracts, permissioned and permissionless blockchains, oracles, and automated market makers ("AMM’s") to keep DAI at one USD.

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95. *Id.* Permissionless blockchains are open networks that allow anyone to participate in the consensus process to validate transactions and data. See Toshendra Kumar Sharma, *Permissioned and Permissionless Blockchains: A Comprehensive Guide*, BLOCKCHAIN COUNCIL (Nov. 12, 2019), https://www.blockchain-council.org/blockchain/permissioned-and-permissionless-blockchains-a-comprehensive-guide/ [https://archive.ph/AKCHm]. Bitcoin is a permissionless blockchain. *Id.* A permissioned blockchain, on the other hand, only allows those with access, granted by the administrator, to access the distributed ledger. *Id.* Oracles send data from the outside world to a blockchain. Alyssa Hertig, *What Is an Oracle?*, COINDESK (Dec. 22, 2020), https://www.coindesk.com/tech/2020/12/22/what-is-an-oracle/ [https://perma.cc/U96J-V9E5]. A smart contract on the blockchain then uses the data, to make decisions such as whether to dispense money and to whom. *Id.* An automated market maker allows cryptocurrencies to be traded automatically through the use of liquidity pools. See Cryptopedia Staff, *What are Automated Market Makers?*, GEMINI, https://www.gemini.com/cryptopedia/amm-what-are-automated-market-makers (last updated Mar. 14, 2021). So, the AMM allows for users to exchange tokens without using a traditional market of buyers and sellers, where the user has to find a single buyer or seller, each offering a different price. *Id.* Liquidity pools are a shared pot of tokens. A user who provides tokens to a liquidity pool is called a liquidity provider. *Id.* A liquidity provider earns a fee by providing tokens. *Id.* The fee is paid by traders who use the liquidity pool. *Id.* The AMM determines the price of the tokens in the liquidity pool by applying a mathematical formula. *Id.* One common formula is \( \text{tokenA\_balance}(p) \times \text{tokenB\_balance}(p) = k \), where \( k \) means that there is a constant balance of assets that determines the prices of tokens in the liquidity pool. *Id.* Put simply:

If an AMM has ether (ETH) and bitcoin (BTC), two volatile assets, every time ETH is bought, the price of ETH goes up as there is less ETH in the pool than before the purchase. Conversely, the price of BTC goes down as there is more BTC in the pool. The pool stays in constant balance, where the total value of ETH in the pool will always equal the total value of BTC in the pool. Only when new liquidity providers join in will the pool expand in size.
i. DAI and MKR Tokens

Users receive DAI tokens by opening a Maker collateral vault (previously called collateralized debt positions (“CDPs”)). These vaults are smart contracts. They hold the user’s collateral in escrow. A user can submit ether (ETH), USD Coin (USDC), and other coins as collateral. The collateral remains in escrow until the user returns the stablecoin, or until the collateral drops too far below the amount of DAI borrowed and the vault is liquidated. To determine this later amount, DAI uses a liquidation ratio for each vault type, which is determined by the collateral’s risk profile and the Stability Fee. The Stability Fee is an annual percentage fee, determined by MKR token holders. A liquidation ratio defines the amount of cryptocurrency collateral needed to receive a DAI coin; for example, “a 150 [percent] Liquidation Ratio means that a debt of 66.66 DAI must be supported by a collateral value of at least $100.”

MKR token holders also vote on other key operative decisions through Governance and Executive voting. Governance voting is accomplished weekly and is on-chain, meaning on Ethereum. Governance voting includes matters such as the Dai Savings Rate (“DSR”), Debt Ceilings, governance processes, asset priority lists, and

97. See id.
98. See id.
99. See id.; see also Tran, supra note 93.
101. See Tran, supra note 93.
other protocol changes.\textsuperscript{105} On the other hand, Executive votes are for technical changes to the Maker Protocol.\textsuperscript{106} Anyone can make proposals and competing proposals may be introduced at any time.\textsuperscript{107} As with Governance voting, only MKR token holders can vote on executive votes.\textsuperscript{108}

MKR tokens also support the stability of DAI tokens by acting as a recapitalization source in debt auctions, discussed next.\textsuperscript{109} This risk of recapitalization incentivizes MKR holders to avoid risk-taking and to responsibly govern.\textsuperscript{110}

\section*{ii. Auction Mechanisms}

The MakerDAO Protocol uses auction mechanisms when the collateralization ratio is breached.\textsuperscript{111} Specifically, surplus, collateral, and debt auctions are utilized. A surplus auction occurs when stability fees\textsuperscript{112} reach a certain limit; that surplus is auctioned off to external actors for MKR tokens.\textsuperscript{113} The MKR tokens are then burnt, thus reducing the amount of MKR in circulation.\textsuperscript{114} A collateral auction is when a vault’s

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\textsuperscript{106} See How Voting Works, supra note 104.

\textsuperscript{107} See id.

\textsuperscript{108} See id. These votes also occur on-chain and can be accessed through the Executive Page at MakerDAO. Executive Proposals, MAKERDAO, https://vote.makerdao.com/executive [https://perma.cc/UA22-VBCW] (last visited Oct. 18, 2022).


\textsuperscript{110} Id.


\textsuperscript{112} See supra Section I.B.2.a.

\textsuperscript{113} See The Auctions of the Maker Protocol, supra note 111.

\textsuperscript{114} See id.
collateral price drops below the requisite collateralization ratio. The vault is automatically liquidated and auctions off the collateral until the debt is covered. Finally, a debt auction happens when a vault’s collateral has a sharp drop in price and the collateral auction cannot auction off the debt and the surplus from stability fees cannot cover it either. In a debt auction, “the winning bidder pays Dai to cover the outstanding debt and in return receives an amount of newly minted MKR, increasing the amount of MKR in circulation.” MKR holders therefore want to avoid a debt auction, so that the value of their MKR tokens are not depreciated.

iii. External Actors

In addition, external actors—Keepers and Oracles—also help to keep Dai’s price stable. Keepers are independent, usually autonomous, actors that use arbitrage to maintain market equilibrium and inject liquidity into the Maker system. Keepers sell DAI when the market price is above one USD, and buy DAI when the market price is below one USD. The two main forms of Keepers are Market Maker Keepers and Auction Keepers.

115. See id.
116. See id.
117. Id.
118. Id.
119. See Maker: Core Report, CRYPTOEQ, https://www.cryptoeq.io/coreReports/maker-abridged (last visited Nov. 7, 2022) (“Maker requires oracles to provide real-time market price information to the system to adjust the Target Rate when needed. Oracles and Global Settlers are external actors and not native to the platform. Another key exogenous actor in the Maker ecosystem is Keepers.”); see also Oracles, GITHUB: MAKERDAO, https://github.com/makerdao/community/blob/master/faqs/oracles.md [https://perma.cc/5G9Q-NHPJ] (last visited Oct. 18, 2022).
121. See MAKERDAO, supra note 109, at 10.
The former operates on various exchanges, where Keepers buy and sell DAI within a pre-determined minimum and maximum range(s) to keep the price at one dollar.123

The Auction Keepers operate in the auctions discussed in the previous section. Because vault information is publicly available on Ethereum, Auction Keepers monitor accounts and trigger liquidation when the collateralization ratio is breached.124 They then participate in the auctions in order to acquire collateral at attractive prices.125

Oracles are entities that connect a blockchain to off-chain, or external, systems.126 Here, each collateral type has a parallel oracle, that automatically updates the reference price in each vault.127 This allows the vaults, which are smart contracts, to automatically use the price data to determine whether to liquidate or how much Dai it can generate.128 Consequently, oracles introduce a centralized entity into the model, which arguably defeats the purpose of a decentralized currency and poses risks.129

MakerDAO tries to minimize these risks: each oracle has a Medianizer and an Oracle Security Module (“OSM”).130

Feeds send data to the Medianizer.131 Feeds are bots that publish the prices of assets in real time and are run by pseudonymous people and public organizations.132 Feed owners are compensated and thus, according to MakerDAO, are discouraged from malicious behavior.133 Furthermore, MakerDAO Feeds utilize Secure Scuttlebutt: a “database protocol for

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123. See id. (arguing that there may be multiple minimum and maximum ranges, or “bands”). Orders are automatically canceled if they fall outside the maximum range of any of the bands. Id. If an order falls below the minimum, a new order is created. Id.
124. See The Auctions of the Maker Protocol, supra note 111.
125. Id.
128. See Oracles, supra note 119.
129. See generally What Is a Blockchain Oracle?, supra note 126.
130. See Oracles: How it Works, supra note 127.
131. See id.
133. Id.
unforgeable append-only message [F]eeds.”

This means, through digital signing, Feed owners are the only ones who can update the Feed. The Medianizer creates a collateral’s reference price by computing a median price from a whitelist of price feed contracts. The Medianizer controls Feeds through permissioned logic; this is a distributed ledger that is not publicly accessible. The permissioned logic determines several other parameters. MakerDAO employs a median, instead of an average, since it is harder to manipulate the reference price. This is because “control over half of the data providers is needed in order for a fraudulent price to be pushed through. Additionally, using a median naturally filters out irregular price data.”


139. See Median - Detailed Documentation, supra note 137. These parameters include: determining the minimum number of prices to create a new median value (the bar parameter); whether to add or drop whitelists (the lift and drop parameters); and updating the price from whitelist providers (the poke function). Id.

140. See id.

141. Oracles, supra note 119.
Finally, the OSM ensures an hour-long delay from when the Medianizer calculates the price, to when the oracle publishes the price in its various vaults. Thus, the OSM requires an external actor to call the “poke()” function on the Medianizer’s code.

b. Problems

While the MakerDAO protocol is a novel decentralized stablecoin, faults remain. Most importantly, DAI struggles to maintain a peg to USD. This is likely because DAI’s stability depends on each collateral token not breaking. And debt auctions can only work if the underlying asset has value. This connectivity poses a huge risk. No matter how interesting the underlying technology, if a stablecoin is not stable, then it is not much use.

Further, while DAI has its transactions recorded on the blockchain, transparency issues still exist. In 2020, Compound, a crypto lending platform, listed 523 million DAI in its reserves. Meanwhile daistats.com showed only 160 million DAI in circulation. Additionally, there is no real central repository of the MakerDAO Protocol. Plus, the Medianizer is a black box.

While the MakerDAO Protocol is mostly decentralized, necessarily centralized elements pose obvious risks for malicious attacks.

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147. DAI’s whitepaper was incomplete and left terms undefined. The most illuminating sources were on GitHub or Medium articles.

148. See Cochran, supra note 144.
MakerDAO uses cybersecurity procedures, digital signing, and pseudonymity to mitigate risks from oracles and keepers.\textsuperscript{149} However, in practice, other key elements of the Protocol are not decentralized.\textsuperscript{150}

For example, in 2020 the top 50 MKR wallet addresses held more than 50 percent of all Protocol voting authority.\textsuperscript{151} MKR holders’ public voting history reveals decisions that are not necessarily in the best interest for the community, but are often in the best interest of MKR holders.\textsuperscript{152} MKR holders also determine what coins become collateral; because the MKR holders are pseudonymous, it is impossible to know if there is a conflict of interest in which assets are chosen as collateral. This problem is compounded by the lack of decentralization among MKR holders. Further, MakerDAO has a history of choosing assets that are highly volatile and have a strong chance of failing. This suggests that MKR holders are not voting in the interest of the community, which is an underlying assumption of the Protocol.

Finally, over-collateralization of the stablecoin requires extra capital to sit without gathering interest, when it could be invested instead.\textsuperscript{153}

3. Non-Collateralized/Algorithmic Stablecoins

As the name suggests, non-collateralized stablecoins do not use collateral.\textsuperscript{154} Instead, algorithms and smart contracts act as a central bank

\textsuperscript{149} Id. ("The OSM (named via acronym from ‘Oracle Security Module’) ensures that new price values propagated from the Oracles are not taken up by the system until a specified delay has passed. Values are read from a designated DSValue contract (or any contract that has the read() and peek() interfaces) via the poke() method; the read() and peek() methods will give the current value of the price feed, and other contracts must be whitelisted in order to call these. An OSM contract can only read from a single price feed, so in practice one OSM contract must be deployed per collateral type."); see also Understanding Digital Signatures, supra note 135; Secure Scuttlebot, supra note 144.

\textsuperscript{150} See supra Section I.B.2.b.

\textsuperscript{151} See Cochran, supra note 144. The largest holders are: the MakerDAO team, Maker the company, A16z (a venture capital fund), and a number of other investment groups. Id.

\textsuperscript{152} See id.

\textsuperscript{153} See 3 Things to Know About Stablecoins, supra note 70. The Lien Protocol offers a solution by adding an algorithmic layer to crypto-collateralization. This is discussed next. See LIEN PROTOCOL, iDOL WHITE PAPER 3 (2020), https://lien.finance/pdf/idOLWP_v1.pdf [https://perma.cc/MWL9-ABAC].

\textsuperscript{154} See What Are Stablecoins?, supra note 68.
and manage the token supply to keep the price stable. More specifically, when the number of tokens in circulation falls below the price of the peg, the number of tokens are reduced; if the token’s price exceeds the peg, new tokens enter circulation.

A common structure is a two-coin system. One coin maintains the peg. The other absorbs market volatility and is usually called a “share” or “balancer” token. Share tokens frequently trade on secondary DeFi exchanges.

The rapid collapse of the TerraUSD stablecoin has pushed stablecoin regulation into the regulatory spotlight. This Section describes the stablecoin and the purported reasons for its collapse in May 2022.

a. Terraform Labs: UST and LUNA

i. Structure

The Terra ecosystem created a stablecoin by deploying two tokens: Luna (“LUNA”) and TerraUSD (“UST”). UST was the fourth largest stablecoin, and seventh largest cryptocurrency, by market cap. UST

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155. See id.
156. Id.
158. Id.
159. Id.
160. Sutton, supra note 27.
maintained its peg through minting and burning Terra and Luna and by incentivizing arbitrage.\textsuperscript{162} Luna was also a governance token.\textsuperscript{163}

Luna absorbed Terra’s volatility through a protocol that mimicked a central bank.\textsuperscript{164} However, instead of a centralized entity, arbitrage stabilized the price. For instance, when Terra’s demand was high and there was a limited supply, its price increased.\textsuperscript{165} Consequently, Luna was burned, which minted more Terra and increased the UST supply to bring the price back down to its peg.\textsuperscript{166} In turn, when Terra’s demand was low and its supply was too large, its price decreased.\textsuperscript{167} Then, Luna was minted and Terra was burned.\textsuperscript{168} This lessened the supply and increased the price back to its peg.\textsuperscript{169}

Thus, because LUNA and UST could always be swapped for one USD, users were incentivized to arbitrage price discrepancies.\textsuperscript{170} When UST’s price rose above one USD, users could swap one USD worth of LUNA to create one UST token and make an easy profit.\textsuperscript{171} Conversely, when UST’s price dropped below one USD, users could swap one USD worth of UST to create one LUNA token.\textsuperscript{172} During the swap, a


\textsuperscript{163} See generally Stevens & Kelly, supra note 162.


\textsuperscript{165} See generally Stevens & Kelly, supra note 162.

\textsuperscript{166} See generally id.

\textsuperscript{167} See generally id.

\textsuperscript{168} See generally id.

\textsuperscript{169} See generally id.

\textsuperscript{170} See Sandor, supra note 161.

\textsuperscript{171} Id.

\textsuperscript{172} Id.
percentage of LUNA or UST was burned and the rest was deposited into a treasury for investments towards the Terra ecosystem.\footnote{173}

Luna’s independent value in Terraform Labs’ ecosystem made it valuable, and therefore helped incentivize arbitrage.\footnote{174} Terra and Luna were used as payment within this ecosystem.\footnote{175} This included the Mirror protocol, which created synthesized assets that tracked U.S. stocks, futures, and exchange-traded funds performance; the Anchor platform, a lending and savings platform; and Chai, a partner payments platform.\footnote{176} Terra also planned to “add DeFi asset management, additional lending protocols, and decentralized levered insurance protocol” to its network.\footnote{177}

In sum, Terra and Luna’s viability largely depended on Terra’s financial ecosystem to drive demand.\footnote{178} And Terra’s financial ecosystem depended on Terra and Luna to function.\footnote{179} This logic was both circular and risky.\footnote{180}

Even before its fatal crash, UST had deviated from its peg, proving that the Protocol was imperfect.\footnote{181} Financial writer J.P. Koning argues that algorithmic stablecoins’ circular relationship makes them “prone to permanent breakage” because of their delicate dependance on conflicting actors: those who desire stability and those who seek “high-return opportunities.”\footnote{182} Further, these coins rely on individual market actors to remain interested through arbitrage.\footnote{183} Arbitrage is notoriously unreliable and historically fragile.\footnote{184} And work on exchange-traded funds reveals that “market discipline can fail when it is most needed.”\footnote{185} Algorithmic stablecoins are arguably bubbles waiting to pop.

\footnotesize
\begin{footnotes}
\item[173.] Id.
\item[174.] Clements, supra note 157, at 142.
\item[175.] Id. at 142-43.
\item[176.] Id. at 142.
\item[177.] Id.
\item[178.] Id.
\item[179.] See id.
\item[180.] See id. at 143.
\item[181.] Id. at 140.
\item[182.] Id. at 143 (citing J.P. Koning, Algorithmic Stablecoins, AM. INST. ECON. RSCH. (Feb. 1, 2021), https://www.aier.org/article/algorithmic-stablecoins/).
\item[183.] Id. at 140.
\item[185.] Clements, supra note 157, at 140.
\end{footnotes}
As the previous section explains, the network incentives of the Terra ecosystem were circular and flawed. From around November 2021 to May 2022, investors were buying UST from Terra’s liquidity pool, Anchor, as it was offering a 20 percent yield to anyone who lent UST to the pool.\(^{186}\) However, users who lent UST into Anchor could not remove their UST if the token failed.\(^{187}\) And as much as 72 percent of UST was deposited into Anchor.\(^ {188}\) Because of this, there was a high demand for UST.\(^ {189}\)

On May 7, 2022, either a coordinated group of actors, or a singular actor, performed a major sell-off (approximately $85 million) of UST on the Curve protocol.\(^ {190}\) This caused UST’s peg to drop to $0.98.\(^ {191}\) Then, over the next 5 days, UST and LUNA’s price plummeted.\(^ {192}\) And the auction mechanisms to sell-off bitcoin reserves were not enough to


\(^{188}\) Id.

\(^{189}\) See *Anchor Protocol: What Is it, and How Did it Destroy the Terra-Luna Stablecoins*, INDIAN EXPRESS (May 23, 2022), https://indianexpress.com/article/technology/cryptocurrency/what-is-anchor-protocol-that-took-terra-luna-down-7931324/ [https://perma.cc/Q8TB-DX6E]. Some called this system a Ponzi scheme, where money was transferred to earlier investors from later investors as a form of “interest.” Lopatto, *supra* note 187. Others called it an acquisition strategy for new customers, and that the APY would be lowered. *Id.*


\(^{191}\) Wintermeyer, *supra* note 190.

\(^{192}\) *Id.*
reinstate the peg. Moreover, because the Anchor platform locked-in lenders’ UST, many lost all of their savings.

As the value of UST and LUNA plummeted, many of the Terra blockchain’s functions were disabled. The stablecoin and its blockchain ecosystem are effectively dead.

Terra’s collapse is a lesson to regulators: there needs to be an industry standard for stablecoins that accounts for coins that are not collateralized, or—in the case of on-chain and commodity-backed stablecoins—are collateralized by illiquid assets. Parameters must be set for how these platforms can be marketed; Terra’s high annual percentage yield (APY) schemes, discussed next, and comparisons to a safe savings account led to a loss of billions of dollars by hundreds of thousands of people. Stablecoin issuers need to be transparent and accessible with how their platforms work.

C. STABLECOIN USE CASES

How stablecoins are used, and how they might be used, informs the discussion on how they might be regulated.

As mentioned earlier, stablecoins developed to allow traders to convert erratic digital currencies to a form that maintained a constant value. In other words, the initial use for stablecoins was to facilitate trades on crypto exchanges and mitigate trading fees.

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193. Id.
194. See Lopatto, supra note 187.
196. Id.
197. Wintermeyer, supra note 190.
198. Id. See infra Section I.C.
199. The Terra protocol was not written to be accessible to users: terms were often left undefined or required reading linked posts or Reddit forums.
200. Royal, supra note 32; Are Deflationary Stablecoins the Future?, supra note 32; see supra Section I.A.
Stablecoins are also used for lending. Like traditional savings accounts, crypto lending allows holders of cryptocurrency to provide their coins to another for a fee. Cryptobanks, a type of DeFi platform, or exchanges act as the intermediary and forward lenders their share of the interest for lending. Stablecoin savings accounts permit customers to earn an APY of up to 12 percent. The yield for stablecoins is so high because stablecoins are in demand, lenders pump up the yields by offering reward tokens and other bonuses, and market inefficiencies give traders arbitrage opportunities to capitalize on wide pricing discrepancies. This kind of lending comes with many risks, however. For instance, the value of the underlying stablecoin could plummet overnight. Or regulators could shut down lending services, which has happened in certain states. Furthermore, the Federal Deposit Insurance Corporation’s (FDIC) bank insurance and the Securities Investor Protection Corporation’s (“SIPC”) brokerage insurance is unavailable. Finally, the industry is not as tightly regulated as banks or brokerages, meaning that cryptobanks’ disclosures are usually opaque.

Smart contracts are another case for stablecoins. Smart contracts are agreements on a blockchain that automatically execute after preset terms and conditions are met. Smart contracts offer transparency and

205. Shillito, supra note 204; What Is Crypto Lending and How Does It Work?, supra note 203.
207. Id.
208. Id.
209. See id.
211. What Are Smart Contracts on Blockchain?, supra note 85.
trust through automation in traditional areas that depended on third-party intermediaries.\footnote{212} These intermediaries come with costly and time-consuming manual processes, with an increased risk of errors and fraud.\footnote{213} Tokens are used to represent assets, such as real property, an employee offer letter, a loan agreement, or intellectual property.\footnote{214} Stablecoins thus allow parties to use smart contracts without the fear of price volatility that comes with other types of cryptocurrency.\footnote{215}

Stablecoins likewise have use in remittance.\footnote{216} Remittance involves money transfers, of usually $1,000 or less, from people living in diaspora to family members at home.\footnote{217} The market is currently valued at $589 billion.\footnote{218} In 2022 alone, one crypto exchange processed $1 billion in crypto remittances just from the United States to Mexico.\footnote{219} Further, in the last decade, remittance payments have grown with the emergence of the microwork market: a $1 billion jobs market that uses technology to split activities into tasks to be completed by people over the internet.\footnote{220} A pilot program in Nairobi observed that cryptocurrency payment cuts transaction fees by 93 percent and thus drastically reduces the costs of

\footnote{212. OpenLaw Team, Blockchain-Based Lending, MEDIUM (July 11, 2018), https://media.consensys.net/blockchain-based-lending-1ee5edabe8a [https://perma.cc/8V5A-LKAB].
213. Id.
215. See id.
216. Rosenberg, supra note 49.
218. Id.
220. Annie Njanja, Cryptocurrency Payments Key to Lowering Cross-Border Remittance Charges and Boosting Microwork Uptake in Africa, Study Shows, TECHCRUNCH (Feb. 23, 2022), https://techcrunch.com/2022/02/23/cryptocurrency-payments-key-to-lowering-cross-border-remittance-charges-and-boosting-microwork-uptake-in-africa-study-shows/ [https://perma.cc/R46U-4VYY] (“In the last one decade, a $1 billion jobs market—microwork—has emerged around technologies that split activities into piecemeal tasks to be completed by many people over the internet, mostly using mobile devices.”).}
cross-border payments. Stablecoins thus allow cross-border transactions to settle faster than the traditional financial system allows.

Of course, different types of stablecoins are used for different purposes. For example, fiat-backed stablecoins are naturally used in remittance payments, since the receiver transfers the token into their fiat currency, for use in their home country. And commodity-backed stablecoins are used in smart contracts that require them to represent that contract’s asset. On the other hand, any kind of stablecoin can be used for lending and other crypto trading activities.

II. STABLECOINS AS THE NEW PRIVATE FORM OF MONEY?

This Note next looks to Gorton and Zhang’s seminal article to determine whether stablecoins are a private form of money. First, it applies and elaborates on Gorton and Zhang’s framework on money’s properties. Money must be a store of value, a unit of account, a medium of exchange, and satisfy the no-questions-asked (“NQA”) principle: money is accepted in a transaction without due diligence on its value. Then, it looks at the analogy of stablecoins as wildcat banks in the Free Banking Era. Finally, this Part considers whether CBDCs can act as an adequate replacement to private stablecoins, as Gorton and Zhang assert.

This Part concludes that stablecoins may be a private form of money, despite their questionable satisfaction of NQA. Nonetheless, the analogy between stablecoins and wildcat banks is imprecise. Accordingly, stablecoins should not be regulated out of existence through a CBDC.

221. Id. This program specifically used Celo dollars (cUSD), which is a Celo-native stablecoin that tracks the US dollar with fees around $0.01. Id.
223. See Gorton & Zhang, supra note 33.
224. Id. at 3, 9.
225. Id. at 3-4, 9.
226. Id. at 25.
A. Properties of Money

1. Stablecoins as a Medium of Exchange, a Store of Value, and a Unit of Account

Gorton and Zhang assume that stablecoins meet the three traditional properties of money without much discussion. Ultimately, stablecoins do meet these properties. However, the analysis is nuanced, as the conversation around their regulation should be.

A medium of exchange is “an intermediary instrument . . . used to facilitate the sale, purchase, or trade of goods [and services] between parties.” A medium of exchange then allows money to be used as a unit of account, since it can be used to track gains and losses across multiple transactions and compare values of different combinations and quantities of goods and services. Finally, “[a] store of value is an asset, commodity, or currency that maintains its value without depreciating.”

Stablecoins act as a medium of exchange. They generally developed to allow traders to convert erratic digital currencies instantaneously. Their use in remittance, specifically the microwork market, is also an instance of satisfying this principle, since stablecoins are used to facilitate services. Stablecoins are also used for lending, but the high APY accounts for the potential volatility risk.

However, commodity-backed stablecoins are not necessarily used as a medium of exchange because one of their purposes is to provide greater

227. See generally id.
228. See infra Section II.A.1.
232. Royal, supra note 32; Are Deflationary Stablecoins the Future?, supra note 32.
233. Njanja, supra note 220; see supra Section I.C.
exposure and liquidity to physical assets that may otherwise be inaccessible. Practically, a commodity-backed stablecoin could be used as a medium of exchange, since it could be used for trade. Still, stablecoins in smart contracts can represent assets that are not necessarily money, such as real property. Nonetheless, in a smart contract, stablecoins are used to facilitate an exchange, which *ipso facto* is a medium of exchange. Therefore, stablecoins likely satisfy the medium exchange prong of money.

Stablecoins also act as a unit of account because they are valued as another currency or asset, which then allows them to be used as a unit of comparison. In practice, their use to convert other digital currencies fundamentally allows for a price comparison. The same applies to lending and smart contracts, as both allow users to measure the value of the underlying contract. And stablecoins in the microwork remittance market act as a unit of account since employers are valuing services.

Finally, stablecoins act as a store of value, given that their sole purpose is to maintain a stable peg. Yet, a regulatory concern is stablecoins’ capacity to maintain their peg and how a break from their peg could have market-wide repercussions. This will be discussed in the following Section.

2. NQA, the Free Banking Era, and Stablecoins According to Gorton and Zhang

This Section discusses Gorton and Zhang’s NQA theory and its application to stablecoins. Gorton and Zhang explain that the NQA principle requires that both parties to a transaction accept money at par, without having any assurances. They conclude that stablecoins do not satisfy the NQA principle. The authors describe the Free Banking Era, where private banks issued notes backed by gold and silver, as a time where money did not satisfy the NQA principle and caused market

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235. *3 Things to Know About Stablecoins*, supra note 70.
238. Njanka, *supra* note 220 (describing the $1 billion microwork jobs market).
241. *Id.* at 6.
instability from bank runs.242 They then argue that stablecoins parallel wildcat banks and pose identical risks.243

Generally, short-term debt – such as private bank notes or demand deposits – is purposefully information-insensitive; money is accepted at par because all parties know that it is too expensive for due diligence to be desirable.244 In other words, the more opaque a bank’s assets, the costlier it is to produce information, the more information-insensitive the debt is, and the stronger the peg is, making the NQA principle applicable.245

However, this principle does not apply to unregulated assets. If an asset’s backing is not credible, agents have an incentive to produce private information on the assets’ collateral.246 Or, agents avoid this production, and trade “at a price that is less than the fundamental value of the debt.”247

In the case of a bank run, the price adjusts to zero.248 Gorton and Zhang reason that stablecoin issuers face a catch-22. Stablecoins with opaque backing should satisfy NQA since no one would find it profitable to produce information.249 However, if the backing is opaque and unreliable, then the market will produce information, and thus destroy the NQA standard.250 Because stablecoins are not regulated and cannot rely on bank examiners, transparency is thus in their best interest to avoid a price adjustment or run.251 Thus, the authors conclude,
stablecoins do not satisfy NQA because they must have transparent assets to remain at par. The authors contend that money that does not satisfy the NQA principle results in an inefficient market. For example, bank notes during the Free Banking Era were private money that did not satisfy the NQA principle. During this period, banks could be opened as long as notes were backed one-for-one with state bonds, which were deposited with the state treasurers. However, notes did not trade at par between different banks. These differences, or discounts, made it hard to transact. Wildcat banks, which were dishonest banks that sought to defraud the public, would either not deposit the requisite bonds, or would issue notes that would not be redeemed. Notes were also uninsured. In sum, transactions were inefficient because “varying discounts made actual transactions (and legal contracting) very difficult.” Private bank notes were then regulated out of existence in the 1800s, which Congress has the authority to do.

252. Id.
253. Id. at 25.
254. Id. The Free Banking Era lasted from 1837 to 1863 and each state specified what eligible bonds were. See id. at 25, 43.
255. Id. at 27. Discounts were also published in bank note reporters, weekly newspapers in major cities, and in secondary markets. Id. at 27-28. A secondary market that developed during this time were note brokers, who would buy notes from stores. Id.
258. See Sinclair, supra note 255.
259. See Gorton & Zhang, supra note 33, at 29. Legislation also imposed a prohibitively high tax on bank notes other than national bank notes, ending the Free Banking Era. Id.
260. U.S. CONST. art. I, § 8. Article I, Section 8 of the Constitution gives Congress the power to “coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures.” Id. Further, Congress can tax privately created currencies out of existence, as it did during the Civil War with a 10 percent tax on banks for payments in private currency notes. See Gorton & Zhang, supra note 33, at 31-32. In Veazie Bank v. Feno, 75 U.S. 533 (1869), the Court determined that Congress has the authority to issue a uniform currency and to impose a tax on competing currencies to
Gorton and Zhang conclude that, since stablecoins do not satisfy the NQA principle, transactions with them will be inefficient and costly, as happened in the Free Banking Era.\textsuperscript{261} Therefore, stablecoins are not an economically efficient form of money.\textsuperscript{262}

3. An Imprecise Analogy and the Fable of the Cats

While Gorton and Zhang offer an interesting economic perspective, they overlook stablecoins’ fundamental purposes and varieties. The authors assume that private bank notes and stablecoins are directly comparable. Gorton and Zhang also assume that private notes automatically result in market inefficiency.

To start, banknotes and stablecoins have different uses. Private banknotes were held by nearly everyone, while stablecoins are predominantly used by traders in crypto-asset markets, or by other users for specific transactions.\textsuperscript{263} While stablecoins do have other uses, such as in lending, smart contracts, and in remittance, these uses are still not close to private banknotes’ general use.\textsuperscript{264} And while stablecoins’ use may grow, regulators should not regulate solely for potential and stymie innovation.\textsuperscript{265}

Additionally, stablecoins and banknotes have core structural differences. Stablecoins that publish their collateral on the Blockchain, as Tether does on Bitcoin via Omni, make it easy for actors to find

\begin{itemize}
\item \textsuperscript{261} See Gorton & Zhang, supra note 33, at 29.
\item \textsuperscript{262} See id. at 4. Economically efficient money has a convenience yield, or a nonpecuniary return, such as keeping money around for ease of use. Id. Stablecoins do not have this trait, according to Gorton and Zhang, because their questionable value makes them impractical to transact with. Id.
\item \textsuperscript{263} See supra Section 1.A. For example, Tether’s website states that it’s “[d]esigned with Tether’s professional investor audience in mind,” of “minimal issuance and redemption requirements equal to 100,000 USD and $100,000 USDT, respectively.”
\item \textsuperscript{264} See supra Section I.C.
\item \textsuperscript{265} Id.
\end{itemize}
information. Furthermore, on-chain collateralized coins, in the case of MakerDao’s DAI, place their smart contracts with borrowers published on the blockchain. The NQA principle does not seem to apply if the information is neither private nor costly.

On the other hand, Tether’s recent controversy might lend weight to the unsuitability of NQA. However, while Tether’s opaque backing led to lawsuits and controversy, its dollar peg remains. This suggests that the NQA principle works with stablecoins, particularly considering how long Tether was able to maintain its opaque backing. Yet, because of this controversy, Tether is now more transparent with its collateral, which suggests that, even if NQA was applicable to stablecoins, it is now inapplicable. In addition, USDC’s growth rate and emphasis on transparency, coupled with the general call for increased transparency and regulation indicates that the NQA principle is not met.

Finally, algorithmic stablecoins are not backed by collateral at all. Perhaps the NQA principle applies most strongly here: how can users transact without knowing how these coins work? But this presupposes that NQA accounts for more than due diligence on collateral and value and, instead, includes investigation on the overall structure of the currency. This would stretch NQA beyond recognition, making it questionable if the principle is appropriate for stablecoins.

Gorton and Zhang also mischaracterize free banking and presume that because the United States Free Banking Era was an inefficient era, free banking systems necessarily create inefficient markets. First, “Scotland, Northern Ireland, and Hong Kong today have a predominance of private monies’ in circulation without any ill effects for consumers or

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266. See supra Section I.B.1. Tether’s ledger is embedded in the Bitcoin blockchain via Omni, so that there is a public record on the blockchain that corresponds to deposits and withdrawals on Tether’s bank account. See TETHER WHITEPAPER, supra note 48, at 6.

267. See supra Section I.B.2.


269. See TETHER WHITEPAPER, supra note 48, at 17.

270. See In Winning DeFi, Circle’s USDC Shows It Can Be the No. 1 Stablecoin, supra note 54; see also Ligon, supra note 44.

271. See supra Part I.

financial stability.” Historically too, countries have had robust free bank economies. Specifically, Canada offers a good example: the country operated an efficient market with a gold-based dollar, and without a central bank or a centralized currency arrangement. Likewise Scottish banks were hardly regulated, except by contract law, until 1845, and were stable and efficient. Moreover, they did not have to secure notes with specific assets or specie reserves.

Additionally, banks during the Free Banking Era in the United States were regulated. Banks could not establish nationwide branches, so banks could not diversify their assets, leading to bank failures. Free Banking laws instituted “minimum capital requirements, regular reporting requirements and inspections, and (in many instances) specie reserve requirements” in certain states. And free banks all had to secure their notes with specific collateral. Wildcat banks were also relatively rare and mostly specific to Michigan. Free banking was likely thus not the sole cause for market inefficiencies during this era.

In conclusion, stablecoins likely satisfy the traditional properties of money. Further, if NQA is inapplicable—which is debatable—it is irrelevant since it is unclear that stablecoins are comparable to private bank notes. And even if NQA is inapplicable and stablecoins are

273. White, supra note 263.
274. See Selgin, supra note 272. Canada avoided the U.S. panics in 1884 and 1893 and was left unscathed by the Panic of 1907. Id.
275. See id.
276. See id.
278. Selgin, supra note 272.
279. See Carter, supra note 277 (citing Selgin, supra note 272).
280. See Selgin, supra note 272:

That most antebellum banks weren’t “free” itself means that most weren’t wildcats, for all authorities agree that wildcat banking only occurred where Free Banking laws were in effect. But wildcats were rare even in those places. Outside of the (Old) West, it was entirely unknown, and in the West itself it wasn’t all that common. Because different scholars have emphasized different criteria, careful estimates put the total number of wildcats as low as several dozen and no higher than 173, with no more than 90 or so ever present during any one year.
analogous to private bank notes, it is unclear that market inefficiency automatically results.

These distinctions are critical to understand because they inform how stablecoins should be regulated. Specifically, by Gorton and Zhang’s logic, the Government should tax stablecoins out of existence and create CBDCs to replace them, as was done through the National Bank Act in 1863 and subsequent legislation in 1866. In fact, CBDCs are an inadequate replacement to stablecoins as the two are distinct organisms.

B. I SAY STABLECOIN, AND YOU SAY CBDC? LET’S CALL THE WHOLE THING OFF

A CBDC is a “digital liability of a central bank that is widely available to the general public.” It is pegged to the value of a country’s fiat currency. Critically, CBDCs are not cryptocurrencies. They are controlled by a central bank and are therefore not decentralized. They can exist on blockchain, but studies have found that distributed ledgers could impede their efficiency and scalability.

CBDCs enable the public to make digital payments safely, with no credit or liquidity risk. In the United States, Federal Reserve notes are the only type of central bank money available. The use of Federal Reserve notes has drastically decreased in developed countries, particularly during the COVID-19 pandemic. In the United States alone, 5 percent of adults do not have a bank account; a total of 13 percent that have bank accounts use expensive alternative services, such as money

281. See Gorton & Zhang, supra note 33, at 29.
284. See id.
287. See id.
288. See Seth, supra note 283.
orders, payday loans, and check-cashing services.\textsuperscript{289} Thus, CBDCs can laudably “provide businesses and consumers with privacy, transferability, convenience, accessibility, and financial security,” and “reduce cross-border transaction costs, and provide those who currently use alternative money transfer methods with lower-cost options.”\textsuperscript{290} CBDCs also offer a path to financial inclusion where geography is an impediment to physical banking.\textsuperscript{291}

Of existing CBDCs, there is no uniform issuance model.\textsuperscript{292} The Eastern Caribbean implements an account-based model, whereby consumers hold deposit accounts directly with the central bank.\textsuperscript{293} On the other hand, China’s CBDC pilot uses private-sector banks to distribute and maintain accounts.\textsuperscript{294} Meanwhile, the European Central Bank is considering using a permissioned blockchain, where each financial institution operates a node on the network.\textsuperscript{295} Finally, a fourth, untested, model would issue fiat currency as anonymous fungible tokens to protect user privacy.\textsuperscript{296}

Many other governments, the United States included, are launching, or at least considering launching, CBDCs for the purpose of reducing cryptocurrency use.\textsuperscript{297} The International Monetary Fund (IMF) has gone so far as to call cryptocurrencies a private form of digital money, and that CBDCs offer a better alternative than “the better managed and regulated

\begin{align*}
\text{290. } & \text{Id.} \\
\text{291. } & \text{See Kristalina Georgieva, The Future of Money: Gearing up for Central Bank Digital Currency, Speech at the Atlantic Council (Feb. 9, 2022) (transcript available at https://www.imf.org/en/News/Articles/2022/02/09/sp020922-the-future-of-money-gearing-up-for-central-bank-digital-currency). CBDCs can also work in emergencies. Id. For instance, the Eastern Caribbean Central Bank extended its CBDC pilot to areas struck by a volcanic eruption in 2021. Id.} \\
\text{293. } & \text{Id.} \\
\text{294. } & \text{Id.} \\
\text{295. } & \text{Id.} \\
\text{296. } & \text{Id.} \\
\text{297. } & \text{See Seth, supra note 283.}
\end{align*}
stablecoins.” The IMF’s report further declares one of CBDC’s goals to be to “increase competition in a country’s payments sector . . . by competing with existing forms of payments.”

This rationale is also seen in President Biden’s Executive Order on Ensuring Responsible Development of Digital Assets. Section 4 of that Order “places the highest urgency on research and development efforts into the potential design and deployment options of a United States CBDC.” The Order also states that a United States CBDC would offer “fewer of the risks posed by private sector-administered digital assets.”

The Federal Reserve continues to explore the benefits and risks of implementing a central bank digital currency. Most recently, in June 2022, the Federal Reserve released a report on how CBDCs could help the economy function more effectively. However, the Report’s discussion on stablecoins is rather shallow as it merely cites previous reports, namely the PWG Report, none of which cover the full stablecoin ecosystem. And while stating that “a full discussion of stablecoin arrangements is outside the scope of this paper,” the Report nonetheless recommends that a CBDC could provide a safe alternative for private-sector innovations. Finally, the Federal Reserve’s report presupposes

298. Georgieva, supra note 291.
301. See id.
302. See id.
305. See id.
306. See id. at 17, 14-15:

A CBDC could spur innovation by banks and other actors and would be a safer deposit substitute than many other products, including stablecoins and other types of nonbank money. . .

A U.S. CBDC would offer the general public broad access to digital money that is free from credit risk and liquidity risk. As such, it could
that stablecoins are a private form of money. As the previous section illustrates, this conclusion is far from certain. And even if stablecoins are private bank notes, an inefficient market does not necessarily result. Thus it does not follow that the Federal Reserve should disseminate CBDCs to the exclusion of stablecoins. Stablecoins indeed should and need to be regulated; they do not need to be eliminated, however.

III. STABLECOINS AS DEPOSITS?

This section examines how stablecoins compare to Demand Deposit Accounts (“DDA’s”). DDAs allow funds to be withdrawn at any time, without notice. Checking accounts and savings accounts are a popular type of DDA. This Part considers two interpretations on deposits, one by the Department of Justice (DOJ) and the other by the Supreme Court. The first interpretation pertains to the Federal Reserve Board of Governors’ (“the Board of Governors”) attempt to expand the definition of deposits to include money market funds (“MMF’s”). The second focuses on the Board of Governors efforts to include negotiable order of withdrawal (“NOW”) accounts as demand deposits. This Part looks to the different structures of stablecoins to argue that a blanket regulation as demand deposits would be inappropriate.

A. SECTION 21 OF THE GLASS-STEAGALL ACT

Section 21 of the Glass-Steagall Act makes it unlawful for anyone “to engage, to any extent whatever[,] . . . in the business of receiving

provide a safe foundation for private-sector innovations to meet current and future needs and demands for payment services. All options for private digital money, including stablecoins and other cryptocurrencies, require mechanisms to reduce liquidity risk and credit risk. But all these mechanisms are imperfect. In our rapidly digitizing economy, the proliferation of private digital money could present risks to both individual users and the financial system as a whole. A U.S. CBDC could mitigate some of these risks while supporting private-sector innovation.

307. See id.
308. See supra Section II.A.3.
309. See supra Section II.A.3.
311. See id.
The text and legislative history of Section 21(a)(2) give deposits a broad definition. An interpretive letter, issued by Assistant Attorney General Philip Heymann, addressed the issue and has become “the best known illustration” of Section 21’s “functional approach to defining deposits.”

According to Professor Howell E. Jackson, the letter did not focus on the absence of the word deposit. And it “proceeded on the assumption that Section 21 should be applied to novel financial innovations, even if not offered by traditional depository institutions.” Thus, according to Jackson, federal authorities should take a similar functional approach with respect to stablecoins because “stablecoin issuers are attempting to produce a deposit-like product, with a value tied to the U.S. dollar.”

Yet, Jackson’s analysis misses two key elements. First, while this famed interpretive letter did take a functional approach, it also did not recommend expanding the definition of deposit to include MMFs. The letter actually emphasizes that on-demand redemption is not a sufficient condition to find deposits.

Availability of particular mechanisms for an investor to transfer his ownership is a mere formality and serves in no way to alter the substance of his status as owner. As between him and the fund, the potential for capital gain or loss on his investment remains unaffected by the means he may select to realize his investment, and he is not, by his selection of the mechanism of a combined order to sell and pay over [check] to realize his investment, converted into a mere creditor of the fund with no expectation of capital gain or loss from the fund upon realization.

314. Id.
315. See id.
316. Id.
317. Id.
318. Letter from Assistant Attorney General Philip Heymann, Criminal Division, to Martin Lybecker, Associated Director, SEC Division of Marketing Management (Dec. 18, 1979):
Second, Jackson assumes that stablecoin issuers are deposit-like, without analyzing different coins.\(^{319}\) Even coins in the same category differ in their analogy to deposits. Circle’s redemption process most closely resembles a demand deposit: “The issuer sends USD from its reserves to the user’s bank account.”\(^{320}\) On the other hand, Tether’s contractual relationship with its holders resembles that of MMFs, discussed later.\(^{321}\) And MakerDAO’s vaults are closer to loan agreements than demand deposits.\(^{322}\) Finally, it is difficult to see how Terra and other algorithmic coins fit into a demand deposit framework because they do not have reserves by design.

**B. SCRUTINY OF ON-DEMAND REDEMPTION**

Finally, even when redemption is relevant to the deposit analysis, as with Circle, the Court will scrutinize if it is on-demand. In *Federal Reserve System v. Dimension Financial Corp.*, the Supreme Court struck down the Board of Governors’ attempt to expand the demand deposit definition to include NOW accounts.\(^ {323}\) The Fed argued that NOW

\(^{319}\) See Jackson, supra note 313. The author does state that “federal authorities should engage in a more systematic review of the range of stablecoin products entering the market and determine which of these products pose the kinds of policy concerns that Section 21(a)(2) was designed to police.” Id. However, this part of the analysis is critical to determine if Section 21(a)(2) is the correct regulation for stablecoins, which Jackson argues. See id.


\(^{323}\) Gorton & Zhang, supra note 33, at 13-14. The regulatory text in question was Section 2(c) of the Bank Holding Company Act of 1956, which defined a bank as any institution “which (1) accepts deposits that the depositor has a legal right to withdraw on demand, and (2) engages in the business of making commercial loans.” *Dimension Fin. Corp.*, 474 U.S. at 361.
accounts were “as a matter of practice” payable on demand. Nonetheless, the Court did not find this interpretation reasonable because NOW accounts required prior notice of withdrawal. This requirement, according to the Court, impeded the depositor’s “legal right” to withdraw on demand.

In light of these interpretations, there could be a strong argument that a collateral-backed stablecoin is a demand deposit if (1) its holder contract resembles a debt contract and (2) if it offers unencumbered redemption. Circle might meet this first prong. And the company claims to meet the second prong in its USDC Express account, advertising on its website that “USDC can seamlessly flow from the crypto exchange of your choice into US Dollars in a bank account.”

Ultimately, because only one account of one stablecoin issuer fits the demand deposit structure, stablecoins generally should not be regulated as demand deposit accounts.

IV. STABLECOINS AS MONEY MARKET FUNDS?

This section looks at Money Market Funds (“MMF”)s, their parallel to Tether, and public discourse surrounding Tether’s capacity to break the buck and cause market-wide panic.

A. GENERALLY

A MMF invests in highly liquid short-term instruments, including cash, cash-equivalent securities, and U.S. Treasuries. Collectively, they hold trillions of dollars on behalf of individuals, pension funds, municipalities, businesses, etc. They are not insured by the Federal Reserve.

325. See id. at 14.
326. Id. (citing Dimension Fin. Corp., 474 U.S. at 368).
Deposit Insurance Corporation (FDIC). A MMF aims to sustain a net asset value of one USD per share. Excess earnings are distributed to investors through dividends. This is a principal reason why MMFs are attractive: fund managers make regular dividend payments to investors. Funds are typically redeemable on demand.

The interpretive letter discussed above provides an interesting parallel between MMFs and stablecoins. The letter did not focus on the ease of redemption, but rather on “the technical distinctions between debt and equity” to find that MMFs were not deposit-like instruments, because “one who invests in a money market fund is an owner pro tanto of the fund” and is subject to market fluctuation.

Tether’s contractual relationship with its holders resembles that of MMFs and their investors: both are not obligated to exchange one share or coin for one dollar but can sell an underlying measure of assets and give the investor or holder proceeds.

On-chain collateralized stablecoins, like MakerDAO’s DAI, pose interesting parallels to MMFs. As it is unlikely that stablecoins will be regulated as commercial loans, they could perhaps be regulated as MMFs. DAI is issued to holders who stake their own crypto collateral, which is subject to market fluctuation. Thus, holders of DAI, like investors in MMFs, remain partial owners of the vault’s assets. However, this analogy is not exact because DAI holders are not passive actors, like MMF investors; DAI holders make the decision to stake a specific type of crypto collateral while MMF investors give bankers the discretion on

331. *See* Segal, *supra* note 328.
332. *See id.*
333. *See id.*
336. *Id.*
investments. Because of this difference, the reasons for protecting MMF investors with regulations do not necessarily apply to DAI holders.

MMFs are not necessarily a proper comparison to other stablecoins. As discussed in the previous section, Circle is closer to a DDA than a MMF. Commodity-backed stablecoins more naturally fall under the Commodity Exchange Act. Finally, algorithmic stablecoins are dissimilar to MMFs because they do not have reserves.

Even though only one stablecoin issuer truly fits the MMF mold—and admittedly Tether is the largest issuer—regulators fear that a run on stablecoins mirrors breaking the buck and could have market-wide repercussions.

B. BREAKING THE BUCK AND THE FEAR OF STABLECOIN RUNS

Breaking the buck occurs when a MMF’s share price deviates more than 0.5 percent from its one USD net asset value. When this happens, investors can no longer redeem one share for one USD. This can—and in 2008, did—lead to market-wide panic where investors run to sell their shares. Regulations are now in place to help prevent MMF runs.

The SEC enacted Rule 2a-7 in 2008. This regulation requires MMFs to have more conservative maturities and credit rankings: an investment’s average dollar-weighted portfolio maturity cannot exceed 60 days and only 3 percent of assets can be in securities that do not fall within the first or second-highest credit ranking tier. Rule 2a-7 also requires more stringent liquidity requirements.

Rule 2a-7 makes sense in the context of fiat-backed stablecoins. Because they make up the bulk of the stablecoin market, have a large

340. See Gorton & Zhang, supra note 33, at 22; see also Segal, supra note 328.
341. See Gorton & Zhang, supra note 33, at 22.
342. Id.
344. Id.
345. Smith, supra note 343. For example, at least 10 percent of taxable funds’ investments must be cash convertible within one day; at least 30 percent of investments must be cash convertible within five business days; and at most 5 percent investments can take more than one week to be converted into cash. Id.
market capitalization, and companies are moving towards this direction already, it would be helpful to mandate Rule 2a-7 requirements across the board to ensure investor safety. However, other, more specific ex ante regulations need to take place given the variety of stablecoins.

**CONCLUSION**

Stablecoins are a unique and exciting area in Fintech. One of the most fascinating aspects of stablecoins is their diversity. And the community’s commitment to creating decentralized stablecoins is laudable. However, as seen with Terra, such coins come with risks, and investors should be adequately educated on these risks. Some other features, such as automatic market makers, need to be regulated to protect investors. Terra’s collapse underlines the need for regulators to scrutinize coins that use imperfect, and therefore risky, methods to maintain a peg. The centralized elements of stablecoins—the reserves in off-chain collateralized stablecoins—should also meet certain liquidity and transparency requirements to help prevent runs.

However, it does not follow that stablecoins should be regulated out of existence, as private bank notes were in the 1800s.

At the very least, regulators must understand the full stablecoin ecosystem before passing any regulations. This is because, as seen with 19th century private bank notes, DDAs, and MMFs, stablecoins do not fit any mold. Also, while CBDCs have the potential to help with financial inclusion, they will likely not replace stablecoins because they are simply distinct creatures.

The current body of research published by different government offices is inadequate. The statements made by government officials are lacking in depth. The government should not pass stablecoin regulations merely because it is politically expedient to do so. First and foremost, the Government needs to continue to partner with the crypto community. And they already have: SEC Commissioner Hester Peirce regularly reaches out to the crypto community for their opinions.346

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For now, the text of the proposed safe harbor is available for viewing as an appendix to this speech at sec.gov and will be posted on social
Federal authorities could over-extend old law, as has been done with ICOs. But stablecoins offer an opportunity for regulators to start from scratch. And they should.