

Taming Wildcat Stablecoins

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Cryptocurrencies are all the rage, but there is nothing new about privately produced money. The goal of private money is to be accepted at par with no questions asked. This did not occur during the Free Banking Era in the United States—a period that most resembles the current world of stablecoins. State-chartered banks in the Free Banking Era experienced panics, and their private monies made it very hard to transact because of fluctuating prices. That system was curtailed by the National Bank Act of 1863, which created a uniform national currency backed by U.S. Treasury bonds. Subsequent legislation taxed the state-chartered banks' paper currencies out of existence in favor of a single sovereign currency.

The newest type of private money is now upon us—in the form of stablecoins like “Tether” and Facebook’s “Diem” (formerly “Libra”). Based on lessons learned from history, we argue that privately produced monies are not an effective medium of exchange because they are not always accepted at par and are subject to runs. We present proposals to address the systemic risks created by stablecoins, including regulating stablecoin issuers as banks and issuing a central bank digital currency.

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Introduction

Every financial regulator is thinking about cryptocurrency.¹ Since Bitcoin arrived on the scene in 2009,² innovators have created over 8,000 cryptocurrencies.³ Cryptocurrencies are digital representations of tokens that reside on blockchains. These can roughly be divided into three categories. The first includes cryptocurrencies that are not backed by anything, like Bitcoin.⁴ We call these “fiat cryptocurrencies.” Their defining feature is that they have no intrinsic value. Second, there are specialized “utility coins,” like the JPMorgan coin that is limited to internal use with large clients.⁵ Finally, there are “stablecoins,” which aspire to be used as a form of private money and so are allegedly backed one-for-one with government fiat currency (e.g., U.S. dollars).⁶ We focus on stablecoins in this article.

While the technology changes, and the form of privately produced money changes, the issues with privately produced money do not change—namely, private money is a subpar medium of exchange and is subject to runs. To see this, one must recognize that money has several important properties, with the three most commonly stated ones being a store of value, a unit of account, and a medium of exchange.⁷ The property that’s most obvious, yet not explicitly presented, is that money also must satisfy the no-questions-asked (“NQA”) principle, which

¹ See, e.g., U.S. Department of the Treasury, *Secretary of the Treasury Janet L. Yellen to Convene a Meeting of the President’s Working Group on Financial Markets to Discuss Stablecoins*, PRESS RELEASE (Jul. 16, 2021), available at <https://home.treasury.gov/news/press-releases/jy0276> (“Today, Secretary of the Treasury Janet L. Yellen announced plans to convene the President’s Working Group on Financial Markets (PWG), in addition to the Office of the Comptroller of the Currency and the Federal Deposit Insurance Corporation, to discuss interagency work on stablecoins.... The PWG was established to enhance the integrity, efficiency, orderliness, and competitiveness of U.S. financial markets. In addition to the Secretary of the Treasury, the PWG members are the Chair of the Board of Governors of the Federal Reserve System, the Chair of the Securities and Exchange Commission, and the Acting Chairman of the Commodity Futures Trading Commission.”).

² See, e.g., Reuben Grinberg, *Bitcoin: An Innovative Alternative Digital Currency*, 4 HASTINGS SCI. & TECH. L. J. 159 (2012). See also Zoe Bernard and Grace Kay, *The Many Alleged Identities of Bitcoin’s Mysterious Creator, Satoshi Nakamoto*, BUSINESS INSIDER (Feb. 26, 2021), available at <https://www.businessinsider.com/bitcoin-history-cryptocurrency-satoshi-nakamoto-2017-12>.

³ See CoinGecko, available at <https://www.coingecko.com/en> (data as of June 29, 2021).

⁴ Steve Patterson, *Bitcoin Is Not Backed By Anything (And That’s OK!)*, BITCOIN MAGAZINE (Oct. 21, 2014), available at <https://bitcoinmagazine.com/culture/bitcoin-is-not-backed-by-anything-and-thats-ok-1413917586>.

⁵ Ian Allison, *Remember JPM Coin? Next Step Is Programmable Money, Bank Exec Says*, COIN DESK (Jun. 7, 2021), available at <https://www.coindesk.com/jpm-coin-programmable-money-defi>.

⁶ See, e.g., Jess Cheng, *How to Build a Stablecoin: Certainty, Finality, and Stability through Commercial Law Principles*, 17 BERKELEY BUS. L. J. 320 (2020); Craig Calcaterra, Wulf A. Kaal & Vadhindran Rao, *Stable Cryptocurrencies: First Order Principles*, 3 STAN. J. BLOCKCHAIN L. & POLY 62 (2020); Marco Dell’Erba, *Stablecoins in Cryptoeconomics: From Initial Coin Offerings to Central Bank Digital Currencies*, 22 N.Y.U. J. LEGIS. & PUB. POLY 1 (2019). See also James Mackintosh, *Bitcoin’s Reliance on Stablecoins Harks Back to the Wild West of Finance*, WALL STREET JOURNAL (May 27, 2018), available at <https://www.wsj.com/articles/bitcoins-reliance-on-stablecoins-harks-back-to-the-wild-west-of-finance-11622115246>.

⁷ See, e.g., N. Gregory Mankiw, PRINCIPLES OF ECONOMICS; Christine Desan, MAKING MONEY: COIN, CURRENCY, AND THE COMING OF CAPITALISM.

requires the money be accepted in a transaction without due diligence on its value.⁸ In other words, NQA means both parties to a transaction must agree that the money be accepted at par—a ten-dollar bill should be accepted as being worth ten dollars, not a penny less. Achieving the characteristic of NQA has, historically, been very hard.⁹ Few remember that demand deposits were unable to achieve NQA without deposit insurance. And, even with deposit insurance, the identity of the check-writer matters, so there are still questions asked, which is why demand deposits do not circulate as money. They remain account-based but have a partial NQA property. It is this NQA property that allows money to have a convenience yield—that is, a return which is all, or in part, nonpecuniary. For instance, individuals carry cash around even though it does not pay interest, because it has a convenience yield.¹⁰

The most economically efficient forms of money are ones that maintain a uniform price at par, thereby enhancing the convenience yield. However, if the price is to stay fixed and not vary as other prices do then, in order to equate supply and demand, it is the quantity which must sometimes adjust. Indeed, the quantity can adjust very quickly to zero during a bank run, a situation where the backing of the money becomes suspect and holders instead want cash. Privately produced money is vulnerable to such runs.

Stablecoins are a new form of private money that can add value in cross-border transactions for firms and banks. They are still in their early days and, so far, it is unclear how widely used they are as money or have a convenience yield. This may partly be due to the fact that they are not sufficiently differentiated from fiat cryptocurrencies; for example, stablecoins still trade on the same exchanges as fiat cryptocurrencies and are used to buy and sell fiat cryptocurrencies.¹¹ But stablecoins will grow and evolve. The main question is how policymakers will adjust our regulatory framework to handle their growth and evolution in the coming years.

The rest of our article is organized as follows: Part I provides the detailed definition of stablecoins and highlights key market developments over the past few years. It addresses the fundamental question of, what exactly are stablecoins? Part II begins the historical review by focusing on money market funds and the trajectory of banking history since they were deemed to not be deposit-taking institutions. Part III goes back further in time and describes the Free Banking Era, the consequences of porous regulation, and the eventual

⁸ The NQA principle is due to Bengt Holmström, *Understanding the Role of Debt in the Financial System*, BANK FOR INTERNATIONAL SETTLEMENTS WORKING PAPER NO. 479 (Jan. 14, 2015), available at <https://www.bis.org/publ/work479.htm>.

⁹ See, e.g., Gary Gorton, *The History and Economics of Safe Assets*, 9 ANNUAL REVIEW OF ECONOMICS 547 (2017).

¹⁰ Banks obtain cheap funding because of the convenience yield, and then lend the money out. As an illustration, suppose banks pay one percent interest on their deposits and suppose it would have been three percent were it not for the convenience yield. Banks lend the deposits out and receive four percent, making a profit of three percent (*i.e.*, four percent minus one percent). That's the business of banking in a nutshell.

¹¹ See, e.g., *Binance Trading Statistics*, COIN MARKET CAP (accessed Jun. 28, 2021), available at <https://coinmarketcap.com/exchanges/binance/>.

demise of the system via the National Bank Act. Based on these historical lessons, Part IV presents policies to address the NQA problem and run risk presented by stablecoins. In general, we observe that the federal government has two sets of options: (1) convert stablecoins into the equivalent of public money by (a) bringing stablecoins within the insured-bank regulatory perimeter or (b) requiring stablecoins to be backed one-for-one with Treasuries or reserves at the central bank; or (2) introduce a central bank digital currency and tax private money out of existence. Table 1 provides a snapshot of the options and whether each option, by itself, could mitigate run risk and achieve NQA.

Table 1: Options to Address Stablecoins

Options	Would this option eliminate runs on stablecoins?	Would this option help stablecoins achieve NQA?
Status quo (<i>i.e.</i> , do nothing)	No	No
Implement bank-like regulations on stablecoin issuers, but no insurance	No	No
Issue stablecoins from within the insured-bank regulatory perimeter	Yes	Yes
Require stablecoins to be backed one-for-one by Treasuries or central bank reserves	Yes	Yes
Replace stablecoins with a central bank digital currency	Yes	Yes

In the table, the last three options would appear to produce equivalent results in that they would all make stablecoins safe and satisfy the NQA principle. Indeed, insuring stablecoins or requiring them to be backed one-for-one either by central bank reserves or Treasuries would essentially transform stablecoins into a national currency. However, there are nuances. For example, the option of requiring stablecoins to be backed one-for-one by Treasuries essentially ties two forms of money together at a fixed ratio. (Treasuries have a convenience yield and are a form of money for storing value safely.) Consequently, there is likely to be a shortage of one of the forms of money. This option was tried during the National Banking Era when the government required national bank notes to be backed by Treasuries. This had poor results. There was an under-issuance of national bank notes because banks did not want to move all the Treasuries to back national bank notes. As a result, demand deposits grew seven times faster in the United States than in other developed countries. Demand deposits basically became the shadow banking system of their time, and there were runs on demand deposits.¹²

¹² See Gary Gorton, Toomas Laarits & Tyler Muir, *Mobile Collateral Versus Immobile Collateral*, JOURNAL OF MONEY, CREDIT & BANKING (forthcoming).

Finally, we note the urgency of this project. Some policymakers may view stablecoins as an up-and-coming financial innovation that does not currently pose any systemic risk and therefore believe that the best strategy is to wait to see how things play out. That would be a mistake, because this is precisely when policymakers need to act. If policymakers wait a decade, stablecoin issuers will become the money market funds of the 21st century—too big to fail—and the government will have to step in with a rescue package whenever there’s a financial panic.¹³ In addition, preserving the monetary sovereignty of the government is crucial for monetary policy. Policymakers should learn from history and not make the same mistakes again.

Part I. Digital Money in the 21st Century

Part I provides a technical definition of stablecoins and discusses whether they qualify as “money.” Money traditionally fulfills three conditions: it is a store of value, a unit of account, and a medium of exchange. We argue that, because of credibility issues with respect to their backing, stablecoins are not yet money because they do not satisfy the NQA principle and so cannot be efficiently used as a medium of exchange.

A. What Are Stablecoins?

Stablecoins are a digital form of privately produced money where each coin is supposed to be backed one-for-one with “safe” assets. While that’s the definition on paper, issuers of stablecoins are essentially unregulated banks. “Depositors” buy stablecoins and, for each dollar deposited with the issuer, they receive that number of stablecoins in exchange. Supposedly, depositors can redeem coins at par and at will for cash, just like demand deposits and money market funds. To date, market adoption of stablecoins as money has been limited, but it is growing at an incredible pace. For example, the market capitalization of Tether has increased by more than a multiple of 13 since February 2020.¹⁴ Moreover, stablecoin initiatives backed by large technology companies and financial institutions have the potential for even greater adoption.¹⁵

Stablecoins are distinct from fiat cryptocurrencies like Bitcoin because stablecoin issuers attempt to keep their prices at par. Fiat cryptocurrencies have very volatile prices—rising and falling by double-digit percentages in a matter of weeks or months. For instance, the price of Bitcoin skyrocketed to around \$65,000 per coin in April 2020 before falling to \$35,000 per coin the next month.¹⁶

¹³ See Mark E. Van Der Weide & Jeffery Y. Zhang, *Tale of the Tape: Lessons from the 2008 and 2020 Financial Crises*, 26 STANFORD JOURNAL OF LAW, BUSINESS & FINANCE 413 (2021).

¹⁴ In February 2020, Tether’s market cap was approximately \$4.6 billion. In June 2021, its market cap was approximately \$62.5 billion. See COIN MARKET CAP (accessed Jun. 28, 2021), available at <https://coinmarketcap.com/currencies/tether/>.

¹⁵ See, e.g., Ryan Brown, *Facebook-backed Diem Aims to Launch Digital Currency Pilot Later This Year*, CNBC (Apr. 21, 2021), available at <https://www.cnbc.com/2021/04/20/facebook-backed-diem-aims-to-launch-digital-currency-pilot-in-2021.html>.

¹⁶ See Bitcoin Price Series, COIN DESK, available at <https://www.coindesk.com/price/bitcoin>.

Stablecoin issuers appear to understand that they have the same problem that all banks inherently have. What exactly is the backing for their money? If the stablecoins are not perceived as safe because coin holders have suspicions about the backing, then they may be inclined to run on the issuers.¹⁷ With respect to demand deposits, this problem was solved with federal deposit insurance.¹⁸

Stablecoin issuers try to convince holders of their coins that the coins are backed by reliable assets. It seems that most issuers provide monthly accounting reports. Paxos, for example, stated:

Paxos Trust Company has engaged Withum, a nationally top-ranking auditing firm, to independently verify at specific points in time that the entire supply of Paxos Standard tokens is consistent with USD in reserve accounts at U.S. banks held and managed by Paxos.

Withum performs month-end attestations of these accounts using standards established by the AICPA [American Institute of Certified Public Accountants]. Every attestation report that has been published since the launch of Paxos Standard can be viewed below.¹⁹

Similarly, Circle, the issuer of USDC, stated: “Every month, the US dollar reserves for USDC are attested to by top 5 accounting services firm, Grant Thornton LLP. We publish those reports so that you can be confident that USDC is always 100% redeemable for dollars.”²⁰ Indeed, the March 2021 Grant Thornton Report asserted: “US Dollars held in custody accounts are at least equal or greater than the USDC tokens outstanding at the Report Date and Time.”²¹

Other stablecoin issuers are less clear about their holdings. Tether, for instance, describes its backing assets this way: “Every Tether token is always 100% backed by our reserves, which include traditional currency and cash equivalents and, from time to time, may include other assets and receivables from loans made by Tether to third parties, which may include

¹⁷ The first cryptocurrency bank run has already occurred. Iron Titanium token (TITAN) dropped from an all-time high of over \$64 to \$0 in less than 24 hours after a massive selloff. The issuer of TITAN said: “We never thought it would happen, but it just did. We just experienced the world’s first large-scale crypto bank run.” See Iron Finance Post-Mortem (Jun. 17, 2021), available at <https://ironfinance.medium.com/iron-finance-post-mortem-17-june-2021-6a4e9ccf23f5>.

¹⁸ See Gary B. Gorton, MISUNDERSTANDING FINANCIAL CRISES: WHY WE DON’T SEE THEM COMING (2012). What about the wholesale deposit market, which is not insured? The wholesale deposit market largely takes the form of sale and repurchase agreements, which are collateralized with bonds as a substitute for government insurance.

¹⁹ Paxos, Monthly Attestation Reports (accessed Jun. 28, 2021), available at <https://www.paxos.com/attestations/>.

²⁰ Circle (June 29, 2021), available at <https://www.circle.com/en/usdc>.

²¹ Grant Thornton, *Independent Accountant’s Report* (May 24, 2021), available at <https://www.circle.com/hubfs/USDCAttestationReports/2021-Circle-Internet-Financial-attestation-march2021.pdf>. See also Siddharth Venkataramakrishnan, *Circle Listing Will Test Top Stablecoin’s Transparency Over Reserves*, FIN. TIMES (Jul. 9, 2021), available at <https://www.ft.com/content/7676451f-23a9-42eb-a179-c3ebbcfc0bff>.

affiliated entities (collectively, ‘reserves’). Every Tether token is also 1-to-1 pegged to the dollar, so 1 USDƒ Token is always valued by Tether at 1 USD.”²²

New York Attorney General Letitia James sued Bitfinex and Tether, both owned by Hong Kong-based iFinex, asserting that “Tether’s claims that its virtual currency was fully backed by U.S. dollars at all times was a lie. These companies obscured the true risk investors faced and were operated by unlicensed and unregulated individuals and entities dealing in the darkest corners of the financial system.”²³ These entities agreed to pay \$18.5 million. In the settlement,²⁴ Tether agreed to the following:

Publication of Tether’s Reserves: On at least a quarterly basis for a period of two (2) years following the effective date of this Settlement Agreement, Tether will publish the categories of assets backing tether (*e.g.*, cash, loans, securities, etc.), specifying the percentages of each such category, and specifying whether any such category constituting a loan or receivable or similar is to an affiliated entity, in a form substantially similar to that previously presented to the OAG.

Tether then released one page with two pie charts showing backing of 3.87 percent cash and 2.94 percent Treasury bills.²⁵

B. Are Stablecoins “Money”?

Students in Economics 101 know that money has three important properties. It must be a store of value, a unit of account, and a medium of exchange.²⁶ But this is not complete because it is just assumed that the object will be used as a “medium of exchange.” For that to happen, the object must satisfy the NQA principle, a necessary condition for money to be a medium of exchange.

It is difficult to engage in transactions or store value when the price of a claim fluctuates and parties are differentially informed about the value of the claim. This has been a problem for centuries.²⁷ Even the value of gold coins was difficult to ascertain because they were shaved or sweated (*i.e.*, shaken to remove gold dust).²⁸ Privately produced money is designed to be information-insensitive, such that no party to a transaction wants to engage in due diligence

²² Tether’s claim of “100% Backed” (accessed Jun. 28, 2021), *available at* <https://tether.to/>.

²³ Press Release, *Attorney General James Ends Virtual Currency Trading Platform Bitfinex’s Illegal Activities in New York* (Feb. 23, 2021), *available at* <https://ag.ny.gov/press-release/2021/attorney-general-james-ends-virtual-currency-trading-platform-bitfinexs-illegal>.

²⁴ Settlement Agreement, Attorney General of the State of New York Investor Protection Bureau *available at* https://ag.ny.gov/sites/default/files/2021.02.17_-_settlement_agreement_-_execution_version.b-t_signed-c2_oag_signed.pdf.

²⁵ Tether Reserves Breakdown at March 31, 2021, *available at* <https://tether.to/wp-content/uploads/2021/05/tether-march-31-2021-reserves-breakdown.pdf>.

²⁶ *See* Mankiw, *supra* note 7.

²⁷ *See* Gorton, *supra* note 9.

²⁸ *Id.* at 550.

about the money because it is too expensive. And all parties to the transaction know this, which is why the money is accepted at par.

The idea that the price of privately produced money should trade at par, and not fluctuate, makes the money immune to losing to insiders when transacting. Dang, Gorton, and Holmström argue that this can be accomplished if the price of the debt does not change.²⁹ And this is best accomplished by backing the debt with debt—for example, by backing private bank notes with state bonds, by backing demand deposits with portfolios of loans, or by backing sale and repurchase agreements (“repos”) with specific bonds. Debt-on-debt produces optimally information-insensitive debt.³⁰

In general, what should the backing debt be? Dang, Gorton, Holmström, and Ordoñez show that there are synergies between the liability side and the asset side of banks.³¹ The asset side should consist of loans that are opaque and costly to produce information about, like loans to small businesses and home mortgages. In that case, the money that these assets back becomes information-insensitive.³²

The financial system changes and the forms of short-term debt change. Repos, for example, grew into a large category of short-term debt over the last 40 or 50 years.³³ When short-term debt and its collateral are not regulated, the fixed price likely will not hold. In that case, the quantities adjust—to zero in a bank run. This happened with repos during the 2008 global financial crisis.³⁴

Stablecoin issuers therefore face a trade-off with respect to opacity and transparency. On one hand, it would be best if the backing for their stablecoins were so opaque that nobody would find it profitable to produce information about the backing assets. On the other hand, if the backing is not credible, then the market will want to produce information about the backing. Stablecoin issuers have currently taken the view that transparency is best, because they are not regulated and cannot rely on bank examiners and so they cannot be opaque.

²⁹ See Tri Vi Dang, Gary Gorton & Bengt Holmström, *Ignorance, Debt and Financial Crises*, Working Paper (Apr. 2015), available at <https://spinup-000d1a-wp-offload-media.s3.amazonaws.com/faculty/wp-content/uploads/sites/20/2021/02/Ignorance-Debt-and-Financial-Crises.pdf>.

³⁰ In addition, banks worked actively to prevent their stock prices from revealing information. See Gary Gorton, *The Development of Opacity in U.S. Banking*, 31 YALE JOURNAL OF REGULATION 825 (2014).

³¹ See Tri Vi Dang, Gary Gorton, Bengt Holmström & Guillermo Ordoñez, *Banks as Secret Keepers*, 107 AMERICAN ECONOMIC REVIEW 1005 (2017).

³² Opacity is thus a desirable feature of banks and the debt backing their money-like liabilities. It is the one case where we do not want the price to move in order to “clear the market.” This is why banks and money are special, why they are regulated and examined.

³³ See Gary Gorton, Stefan Lewellen & Andrew Metrick, *The Safe-Asset Share*, 102 AMERICAN ECONOMIC REVIEW: PAPERS & PROCEEDINGS 101 (2012).

³⁴ See Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 JOURNAL OF FINANCIAL ECONOMICS 425 (2012); Gary Gorton, Toomas Laarits & Andrew Metrick, *The Run on Repo and the Fed’s Response*, JOURNAL OF FINANCIAL STABILITY (forthcoming).

C. Are Stablecoins “Demand Deposits”?

By design, a stablecoin is redeemable by the holder of the stablecoin for the underlying asset. It’s an explicit *or implicit* contract between the stablecoin issuer and the stablecoin holder—one stablecoin for one U.S. dollar. From the perspective of economic incentives, a stablecoin is a demand deposit. If people give \$1,000 to a stablecoin issuer in exchange for 1,000 stablecoins, they will behave precisely as if they have \$1,000 in deposits at a bank that’s available for withdrawal at any time. It’s functionally equivalent.

From the law’s perspective, however, the determination isn’t so certain. “Functional equivalence” carries much more weight with economists than lawyers. Based on the existing legal framework, we first have to ask whether stablecoins are deposits and, if they are deposits, whether they are demand deposits. We discuss each in turn.

1. Explicit Debt Contracts

First, in order for the stablecoins to be considered a deposit—let alone a demand deposit—one must determine whether the underlying contract between the holder of stablecoins and the stablecoin issuer is an equity contract or a debt contract. This distinction arose during the 1970s, as many critics of money market funds alleged that their business practice of redeeming shares for cash was essentially deposit-taking and therefore in violation of the Glass-Steagall Act.

On October 18, 1979, Morris D. Crawford, Jr.—the Chairman of the Board of the Bowery Savings Bank of New York—sent a letter to the Securities and Exchange Commission (“SEC”) regarding the legality of money market funds. Specifically, Mr. Crawford questioned whether money market funds violated section 21 of the Glass-Steagall Act, which prohibited entities non-banks from taking deposits.³⁵ Mr. Crawford’s concern was that redemptions offered by money market funds were essentially deposits. On October 19, 1979, Mr. Crawford sent a copy of that letter to the Attorney General of the United States.

In the interpretive letter sent by the Department of Justice to the SEC,³⁶ Philip B. Heymann—the Assistant Attorney General of the Criminal Division—laid out an argument for why money market funds were not engaged in deposit taking. In particular, the Department of Justice observed that depositors are *creditors* yet holders of money market fund shares are *owners*. The investor in a money market fund experiences capital gains and losses, and the investor’s ability to “redeem” is simply a way for the investor to transfer *ownership*. The redemption process cannot transfer that investor into a creditor.

Here are relevant excerpts from the interpretive letter:

It is patent from the quoted statutory language that a depositor is only a creditor of his depository (a debtor in the case of an authorized overdraft, which indebtedness he

³⁵ 12 U.S.C. § 378(a)(2). As discussed later, section 21(a) of the Glass-Steagall Act is still on the books today.

³⁶ The letter was addressed to Mr. Marty Lybecker, the Associate Director of the Division of Marketing Management at the Securities and Exchange Commission.

must liquidate by a “deposit”). It is equally patent that one who invests in a money market fund is an owner pro tanto of the fund.

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 an 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.

...

Inasmuch as investors in a money market fund are, in our view, owners of the fund and not mere depositors, we perceive no violation of section 21(a), Glass-Steagall Act, *supra*, in permitting an investor in such a fund to realize his investment by means of a check or otherwise.

The Department of Justice focused on the technical distinctions between debt and equity rather than the identical economic incentives created by redemptions. As shown in Table 2 below, many stablecoins could be deposits under the logic set forth by the Department of Justice over four decades ago, because holders of those stablecoins are *not* owners of the stablecoin issuer.³⁷ They are essentially a creditor of their depository—*e.g.*, 1,000 stablecoins for 1,000 U.S. dollars. However, some stablecoin issuers like Tether would be treated like money market funds because their contractual relationship with stablecoin holders is equity,³⁸ not debt.

³⁷ All sources corresponding to the information in Table 2 are listed in the Appendix.

³⁸ According to Tether’s online terms of service, “Tether Tokens are 100% backed by Tether’s Reserves... Tether reserves the right to redeem Tether Tokens by in-kind redemptions of securities and other assets held in the Reserves.” Terms of Service, *available at* <https://tether.to/legal/> (last updated May 12, 2020). In other words, Tether is not obligated to exchange one coin for one dollar, which would be a debt contract. Instead, Tether can sell some portion of its underlying assets and give the proceeds to the coin holder when the coin holder seeks redemptions. Notably, Tether’s use of the term reserves “means traditional currency and cash equivalents and, from time to time, may include other assets and receivables from loans made by Tether to third parties, *which may include affiliated entities.*” *Id.* at 1.1.32 (emphasis added).

Table 2: Stablecoins and their Contracts as of June 30, 2021

Name	Type	What is the coin pegged to?	Market Cap	Is the contract equity or debt?
Tether	Directly backed and redeemable	US dollar	\$62.5B	Equity (similar to money market funds)
USDC	Directly backed and redeemable	US dollar	\$25.4B	Debt
TrueUSD	Directly backed and redeemable	US dollar	\$1.4B	Debt
Paxos	Directly backed and redeemable	US dollar	\$780M	Debt
Gemini Dollar	Directly backed and redeemable	US dollar	\$226M	Debt
EURSToken	Directly backed ³⁹	Euro	\$107M	Debt
Stably USD, formerly StableUSD (USDS)	Directly backed and redeemable	US dollar	\$512K	Debt
Stronghold USD	Directly backed and redeemable	US dollar	N/A (Stronghold is inactive for retail investors)	Debt
Facebook's Diem (formerly Libra)	Directly backed and redeemable	Diem will have single currency stablecoins (backed by national currencies) and multi-currency stablecoins (backed by a basket of currencies).	N/A (Not yet released)	Debt

2. Without Prior Notice or Limitation

Second, if certain stablecoins are deposits, are they demand deposits? In the 1980s, as financial innovations were sprouting up and regulatory arbitrage was increasing in frequency, the Federal Reserve attempted to expand its reach in order to regulate what it perceived as new bank-like entities operating outside of the banking regulatory perimeter.⁴⁰

³⁹ EURS is not directly redeemable through STASIS (its issuer), but it can be redeemed through other institutions and digital asset exchanges.

⁴⁰ See Saule T. Omarova & Margaret E. Tahyar, *That Which We Call A Bank: Revisiting the History of Bank Holding Company Regulation in the United States*, 31 REV. BANKING & FIN. L. 113 (2011).

In particular, the Federal Reserve revised Regulation Y to expand the definition of a bank by defining demand deposits to include negotiable order of deposit (“NOW”) accounts under the logic that NOW accounts were “as a matter of practice” payable on demand.⁴¹

In 1986, the U.S. Supreme Court opined on the issue of demand deposits in *Board of Governors of the Federal Reserve System v. Dimension Financial Corporation*.⁴² 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.”⁴³

The Supreme Court held that the Federal Reserve’s expanded definition of demand deposits was not an accurate or reasonable interpretation. Specifically, NOW accounts were not demand deposits due to the requirement of prior notice of withdrawal; that requirement impeded the depositor’s “legal right” to withdraw on demand. According to the Court:

Application of this standard to the Board’s interpretation of the “demand deposit” element of § 2(c) does not require extended analysis. By the 1966 amendments to § 2(c), Congress expressly limited the Act to regulation of institutions that accept deposits that “the depositor has a legal right to withdraw on demand.” 12 U.S.C. § 1841(c). The Board would now define “legal right” as meaning the same as “a matter of practice.” But no amount of agency expertise—however sound may be the result—can make the words “legal right” mean a right to do something “as a matter of practice.” *A legal right to withdraw on demand means just that: a right to withdraw deposits without prior notice or limitation.* Institutions offering NOW accounts do not give the depositor a legal right to withdraw on demand; rather, the institution itself retains the ultimate legal right to require advance notice of withdrawal. The Board’s definition of “demand deposit,” therefore, is not an accurate or reasonable interpretation of § 2(c).⁴⁴

If the redemption process of stablecoins were unencumbered, then one could argue that stablecoin issuers are accepting demand deposits. Table 3 below lists the major stablecoins and shows their characteristics with respect to redeemability.⁴⁵ For example, notice in the table that True USC has a minimum redemption of \$1000. While this world changes quickly, it seems clear that some stablecoins have the features of demand deposits and are trying to store their reserves in credible way.

⁴¹ *See id.*

⁴² 474 U.S. 361 (1986).

⁴³ *Id.* at 361 (emphasis added).

⁴⁴ *Id.* at 368 (emphasis added).

⁴⁵ All sources corresponding to the information in Table 3 are listed in the Appendix.

Table 3: Stablecoins, Redemptions, and Fiat Money as of June 30, 2021

Name	How to redeem it?	Is there a cost to redeem?	Is there a notice period?	How are the underlying assets custodied?
Tether	Submit request through Tether account. Tether is available to redeem in the US in all states except New York.	Yes. Fiat withdrawal fee: the greater of \$1000 or 0.1% of amount withdrawn. Account verification fee: \$150 in Tether tokens.	No. However, there may be an initial delay because Tether accounts need to be verified before redeeming can occur. Verification can take days to weeks.	Deltec Bank & Trust (Tether’s bank partner in the Bahamas).
USDC	1. Request redemption from issuer (minimum 100 USDC) 2. Once verified and validated, USDC tokens are “burned” (deleted from circulation) 3. Funds from underlying reserves are transferred to customer’s external bank.	No. However, user’s bank may charge fees when receiving the funds.	No. However, there is a verification period which may delay the time between requesting redemption and receiving the USD.	With licensed CENTRE token-issuing member (i.e., Circle).
TrueUSD	1. Input bank info into TrustToken app and receive unique redemption address 2. Send TrueUSD (minimum \$1000) to unique redemption address 3. TrueUSD deleted by smart contract, and banking partners issue a wire to user’s bank account within 1 business day.	No. However, may have domestic wire fees of up to \$30 and international wire fees of up to \$100.	No.	Escrow accounts (through partnering registered banks and fiduciaries). These partners include Alliance Trust Company of Nevada and Prime Trust (trust company in Nevada). Banking relationships include US bank, Alliance bank, and Mercantile bank.
Paxos	1. Use Paxos account (which has unique redemption address). Send PAX to redemption address. 2. Paxos will credit account with USD (may take up to 1 business day).	No. However, user’s bank or crypto asset wallet provider may charge transaction fees when receiving the funds.	No.	USD held in Paxos Trust Company in segregated custodial accounts with US banks, or debt instruments of US government.
Gemini Dollar	Sell GUSD on Gemini platform, and USD will be	No.	No.	State Street Bank and Trust Company.

	credited to Gemini account balance at time of sale.			More generally, US banks, eligible for FDIC “pass through” deposit insurance.
EURSToken	N/A — cannot directly redeem from STASIS (its issuer) but can exchange for fiat euros through other institutions (Globitex, Exante).	N/A	N/A	Various partner institutions, including EXT Ltd (company licensed by Cyprus SEC), XNT Ltd (company licensed by MFSA, Malta), UAB NexPay (electronic money institution, authorized by Central Bank of Lithuania).
Stably USD, formerly StableUSD (USDS)	Redeem by generating a personalized deposit address and sending USDS to this deposit address (minimum \$50). USD will be wired to the user’s bank account.	No. However, user’s bank may charge wire fees for receiving the funds.	No.	FDIC-insured escrow accounts managed by Prime Trust (trust in Nevada).
Stronghold USD	Redeem through Stronghold’s user interface. User can initiate a withdrawal request and get USD through wire transfer or ACH payment, typically within the same day.	No. However, user’s bank may charge fees.	No.	Reserves held in state-chartered trust company, Prime Trust (trust in Nevada). Prime Trust deposits the cash at FDIC-insured banks.
Facebook’s Diem (formerly Libra)	Redeem through Designated Dealers (Designated Dealers will be “well-capitalized financial institutions that will have the right to purchase Diem coins”).	Unclear – May have early redemption haircuts (fee for instant redeeming) in cases of illiquidity. May also have transaction fees, but they are not listed out.	Unclear – May have redemption stays (delayed redeeming) in cases of illiquidity.	Assets held in Reserve, which will be held by geographically distributed network of well-capitalized banks.

D. Are Stablecoin Issuers “Banks”?

First of all, what is a bank? Again, not surprisingly, economists and lawyers differ over its definition. Many banks nowadays engage in three primary business lines: (1) deposit taking, (2) commercial lending, and (3) payments.⁴⁶ For example, Bank of America accepts deposits from customers, issues loans to businesses, and facilitates payments.

The definition from an economics perspective is much simpler: engaging in the business of issuing short-term debt like demand deposits is the necessary and sufficient condition to be a bank.⁴⁷ In other words, a bank is a firm that issues short-term debt, regardless of whether it is recognized by the government as a bank and regardless of whether the redemption contract is explicit or implicit. To say this in another way, a bank is a production function and its output is short-term debt, just as the output of Ford is cars. The short-term debt need not be demandable, but it must be short-term. Examples include sale and repurchase agreements (“repos”), which are largely overnight maturity, as well as commercial paper which is mostly one to four days in maturity.

The existing regulatory framework does not share the same view. Consider the following statutory example. According to the Competitive Equality Banking Act of 1987, an institution is considered a bank for the purposes of the Bank Holding Company Act if it is either (1) an FDIC-insured institution or (2) an institution that accepts demand deposits and makes commercial loans.⁴⁸ It’s clear that neither money market funds nor stablecoin issuers are FDIC-insured institutions so the first prong is unsatisfied.

Regarding the second prong, one could argue that many stablecoins are demand deposits if they are debt contracts and can be redeemed without prior notice or limitation. What about commercial loans? Recall the Supreme Court’s decision in *Dimension Financial*.⁴⁹ At controversy in that case was not only the Federal Reserve’s attempted expansion of demand deposits but also the attempted expansion of commercial loans. In particular, the Federal Reserve wished to scope in “the purchase of retail installment loans or commercial paper, certificates of deposit, bankers’ acceptances, and similar money market instruments.”⁵⁰

The Court adopted a very narrow view of the term “commercial loan,” stating that the term is used in the financial community to describe the direct loan from a bank to a business customer. Specifically:

⁴⁶ See, e.g., Dan Awrey, *Unbundling Banking, Money, and Payments*, ECGI WORKING PAPER SERIES NO. 565/2021 (Feb. 2021), available at https://ecgi.global/sites/default/files/working_papers/documents/awreyfinal_1.pdf.

⁴⁷ See Douglas Diamond & Philip Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*, 91 JOURNAL OF POLITICAL ECONOMY 401 (1983); Gary Gorton & George Pennacchi, *Financial Intermediaries and Liquidity Creation*, 45 JOURNAL OF FINANCE 49 (1990); Tri Vi Dang, Gary Gorton, Bengt Holmström & Guillermo Ordoñez, *supra* note 31.

⁴⁸ See Omarova & Tahyar, *supra* note 40.

⁴⁹ 474 U.S. 361 (1986).

⁵⁰ *Id.* at 361.

As the Board’s characterization of these transactions as “commercial loan substitutes” suggests, however, money market transactions do not fall within the commonly accepted definition of “commercial loans.” The term “commercial loan” is used in the financial community to describe the direct loan from a bank to a business customer for the purpose of providing funds needed by the customer in its business. The term does not apply to, indeed is used to distinguish, extensions of credit in the open market that do not involve close borrower-lender relationships. Cf. G. Munn & F. Garcia, *Encyclopedia of Banking and Finance* 607 (1983). *These latter money market transactions undoubtedly involve the indirect extension of credit to commercial entities but, because they do not entail the face-to-face negotiation of credit between borrower and lender, are not “commercial loans.”*⁵¹

Given the narrow scope applied by the Supreme Court, neither money market funds nor stablecoin issuers would be considered to provide commercial loans. Thus, stablecoin issuers would not be considered banks under the Bank Holding Company Act.

Statutory definitions only show one aspect of the framework. In practice, we observe that a bank is a firm which (1) has a charter from a proper federal government authority (*e.g.*, the Office of the Comptroller of the Currency) or a proper state government authority (*e.g.*, the State of Connecticut Department of Banking or the New York State Department of Financial Services) and (2) has a master account at Federal Reserve.⁵² A master account must be approved by one of the twelve Federal Reserve Banks. Having one is necessary because the chartered institution needs to have direct access to the Federal Reserve’s payment systems, including Fedwire, in order to settle transactions with other banks using central bank money.⁵³ As a practical matter, it is not possible to be a bank without a master account.⁵⁴

Could a stablecoin issuer become a bank in practice? We first consider whether it can obtain a charter from the Office of the Comptroller of the Currency (“OCC”), which does not operate with a statutory definition of a bank under the National Bank Act. Instead, the OCC is authorized to charter an entity as a national bank if it is engaged in the “business of

⁵¹ *Id.* at 370 (emphasis added).

⁵² “A Master Account is the record of financial rights and obligations of an Account Holder and the Administrative Reserve Bank (or any other Reserve Bank maintaining a Master Account identified in Operating Circular 1) with respect to each other, where opening, intraday and closing balances are determined. A Master Account is identified by a Primary nine-digit Routing Transit Number (RTN).” See <https://www.frb services.org/financial-services/accounting/service-setup/master-account.html> (accessed Jul. 14, 2021).

⁵³ Randall Guynn, Margaret Tahyar, Jai Massari, Gabriel Rosenberg & Andrew Samuel, *Davis Polk Discusses Who Can Have a Federal Reserve Master Account*, The CLS Blue Sky Blog (May 12, 2021), available at <https://clsbluesky.law.columbia.edu/2021/05/12/davis-polk-discusses-who-can-have-a-federal-reserve-master-account/>.

⁵⁴ Kraken, a special-purpose depository institution with a Wyoming charter, has stated that one of its main purposes in getting a bank charter was so it could get a Federal Reserve master account. See The National Law Review, *The First Cryptocurrency Bank* (Sep. 22, 2020), available at <https://www.natlawreview.com/article/first-cryptocurrency-bank>.

banking.”⁵⁵ In 2003, the OCC promulgated a rule that set forth its authority to grant a bank charter to any entity engaged in at least one of the three core banking functions: receiving deposits, paying checks, or lending money.⁵⁶

FinTech firms do not want an outcome of being roped into the regulatory perimeter for deposit-taking institutions because of the corresponding regulatory and supervisory burdens. This is why the OCC announced in 2018 that it would start accepting applications from FinTech firms for special purpose bank charters that engage in one of the two core banking activities of paying checks or lending money, but that do *not* take deposits.⁵⁷ The OCC’s special purpose national bank (“SPNB”) charter would give FinTech applicants the opportunity to be regulated and supervised by a single federal agency⁵⁸ and apply for a master account at the Federal Reserve.⁵⁹ Former Comptroller Brian Brooks claimed that the OCC has the authority to issue such charters to non-depository institutions involved in payments and lending, but the OCC lost an initial challenge in court in 2019—*Lacewell v. Office of the Comptroller of the Currency*—when the New York State Department of Financial Services challenged the OCC’s authority.⁶⁰

As the OCC’s SPNB charter has been litigated, the OCC has granted regular national bank charters to FinTech companies such as Varo Bank⁶¹ and Anchorage Digital Bank.⁶² The latter

⁵⁵ 12 U.S.C. § 27(a).

⁵⁶ 12 C.F.R. § 5.20(e)(1). Typically, the OCC grants full-service charters to firms that conduct all three functions.

⁵⁷ *OCC Begins Accepting National Bank Charter Applications from Financial Technology Companies*, News Release (Jul. 31, 2018), available at <https://www.occ.gov/news-issuances/news-releases/2018/nr-occ-2018-74.html>. See also Howell E. Jackson, Margaret E. Tahyar & Carol Rodrigues, *Fintech Charters Memorandum*, Harvard Law School: The Case Studies CSP044 (May 2020), available at https://projects.iq.harvard.edu/files/financialregulation/files/fintech_charters_case_study.pdf.

⁵⁸ Having a national charter from the OCC would allow the chartered entity to preempt state laws. For example, a national bank charter would allow a firm to operate across the country without having to comply with state-by-state interest-rate-limit laws. See Congressional Research Service, *Federal Preemption in the Dual Banking System: An Overview and Issues for the 116th Congress*, CRS Report R45726 (May 17, 2019), available at <https://fas.org/sgp/crs/misc/R45726.pdf>

⁵⁹ According to the OCC, “[a] special purpose national bank is a national bank that engages in a limited range of banking or fiduciary activities, targets a limited customer base, incorporates nontraditional elements, or has a narrowly targeted business plan. Special purpose national banks include those banks whose operations are limited to certain activities, such as credit card operations, fiduciary activities, community development, or cash management activities. Special purpose national banks also include national banks that engage in limited banking activities, including one or more of the core banking functions of taking deposits, paying checks, or lending money.” *Comptroller’s Licensing Manual Supplement: Considering Charter Applications from Financial Technology Companies* (Jul. 2018), available at <https://www.occ.gov/publications-and-resources/publications/comptrollers-licensing-manual/files/considering-charter-apps-from-fin-tech-companies.html>.

⁶⁰ See Lev Menand & Morgan Ricks, *Policy Spotlight: Lacewell v. OCC*, JUST MONEY, available at <https://justmoney.org/lacewell-v-occ/>.

⁶¹ OCC Press Release, *Acting Comptroller of the Currency Presents Varo Bank, N.A. Its Charter* (Jul. 31, 2020), available at <https://www.occ.treas.gov/news-issuances/news-releases/2020/nr-occ-2020-99.html>.

⁶² OCC Press Release, *OCC Conditionally Approves Conversion of Anchorage Digital Bank* (Jan. 13, 2021), available at <https://www.occ.gov/news-issuances/news-releases/2021/nr-occ-2021-6.html>. Under the regular

is particularly relevant as Anchorage is the first federally chartered bank that deals solely with cryptocurrencies. For example, Anchorage provides its clients with a line of credit that is secured with cryptocurrencies such as Bitcoin and Ethereum.⁶³ This gives holders of those cryptocurrencies liquidity without needing to sell them outright.

States have started catering to FinTech firms as well. The state of Wyoming established a special purpose depository institution (“SPDI”) charter, aimed at cryptocurrency businesses seeking access to Federal Reserve services and to be “qualified custodians” for purposes of the SEC’s custody rule. The SPDI charter permits deposit taking but prohibits commercial lending, which is intended to allow the SPDI to seek Federal Reserve services without the SPDI’s parent being considered a bank holding company. Under Wyoming’s SPDI charter, the Wyoming Division of Banking would be the chartered bank’s primary regulator.⁶⁴ Kraken became the first cryptocurrency company to receive an SPDI bank charter.

Following in the footsteps of Wyoming, the state of Nebraska recently passed a law that creates a state bank charter for depository institutions dealing with cryptocurrencies, and these new state-chartered digital asset banks would be allowed to apply for access to the Federal Reserve’s payments system.⁶⁵ The state of Texas is now jumping into the race as well. The Texas Department of Banking recently stated that its state-chartered banks may store cryptocurrencies for their clients.⁶⁶

In this vortex of innovation, interest in gaining access to a Federal Reserve master account is growing among FinTech companies. However, Reserve Banks can decide which institutions receive master accounts regardless of whether the institution has a charter from the OCC or from a state like Wyoming or Nebraska.⁶⁷ Thus, in a practical sense, stablecoin issuers cannot become banks simply by receiving a charter from the OCC or from a state banking authority.⁶⁸

national bank charter, these firms would take insured deposits and would be required to obtain FDIC insurance. See OCC, *supra* note 59, at 2-3.

⁶³ Martin Young, *Digital Bank Anchorage Offers Ethereum-backed Loans to Institutions* (Jun. 4, 2021), available at <https://cointelegraph.com/news/digital-bank-anchorage-offers-ethereum-backed-loans-to-institutions>.

⁶⁴ Wyoming first authorized SPDI charters with the enactment of House Bill 74 in 2019, which created the Special Purpose Depository Institutions Act (“SPDI Act”) at Wyo. Stat. § 13-12-101, et seq.

⁶⁵ Nate DiCamillo, *Nebraska Legislature Approves Framework for Digital Asset Banks*, COIN DECK (May 21, 2021), available at <https://www.coindesk.com/nebraska-legislature-approves-framework-for-digital-asset-banks>.

⁶⁶ Texas Department of Banking, *Authority of Texas State-Chartered Banks to Provide Virtual Currency Custody Services to Customers* (Jun. 10, 2021), available at <https://www.dob.texas.gov/sites/default/files/files/news/Industry notices/in2021-03.pdf>.

⁶⁷ See, e.g., Guynn et al., *supra* note 53.

⁶⁸ Another issue is raised here—namely, the interoperability of FinTech firms and the Federal Reserve is not going to go away. An analogous issue concerns clearing agency licenses, which allow firms to engage in security clearing. Under Section 17A of the Securities Exchange Act of 1934 and Rule 17Ab2-1, an entity wishing to clear securities must register with the SEC. Securities and Exchange Commission, *Clearing Agencies*, available at <https://www.sec.gov/tm/clearing-agencies> (accessed Jul. 14, 2021). Notably, Paxos (a FinTech firm) is applying for

Part II. Money Market Funds in the 20th Century

Suffice it to say, policymakers who were considering whether to regulate money market funds as banks in the 1970s did not foresee the need for future government bailouts. In this Part, we provide a historical overview of money market funds and the consequences of labeling them as securities when it was obvious that their economic content was equivalent to a demand deposit. If there were any confusion about this point, the runs on money market funds in 2008 and in March 2020 provide further evidence.

A. Regulation Q

Money market funds arose as a creature of regulatory arbitrage. The Glass-Steagall Act of 1933 prohibited the payment of interest on demand deposits and authorized the Federal Reserve to set maximum interest rates paid by commercial banks on savings deposits.⁶⁹ Following the instruction set forth by Congress, the Federal Reserve soon after implemented Regulation Q.

Up through the mid-1960s, Regulation Q was not binding. Interest rate caps were set above market interest rates and above the average interest rates paid on savings deposits by member banks.⁷⁰ Then the 1970s arrived. Inflation, as measured by the Consumer Price Index, hit double-digits in that decade as energy shocks roiled the United States. With elevated inflation for the foreseeable future, consumers began to demand a higher return on their savings. Thus, money market funds were born—literally as a workaround to the interest rate cap set by Regulation Q.

Under a typical arrangement, “investors” would buy “shares” of money market funds akin to “depositors” putting money into a “demand deposit.” But unlike other mutual funds, money market funds promised to maintain a stable share price of \$1.00 per share, redeemable on demand. Thus, the investors in money market funds could receive \$1.00 per share on demand plus the yield that was earned during the investment.⁷¹

B. The 2008 Run on Money Market Funds

It’s not surprising that a financial instrument designed to perfectly mimic a demand deposit would have the same upsides and downsides as a demand deposit. When bank depositors believe that the bank is no longer able to provide a full redemption of their deposits, they run on the bank with the hope of withdrawing their deposits before it’s too late. Money market funds are similarly susceptible to runs except the phenomenon is known as “breaking the buck.” When the share price of a money market fund deviates more than 0.5 percent from its stable \$1.00 share price, investors will no longer be able to redeem one share for one dollar

such a license. *Cryptocurrency Firm Paxos to Apply for Clearing Agency License*, Reuters (Apr. 6, 2021), available at <https://www.reuters.com/technology/cryptocurrency-firm-paxos-apply-clearing-agency-license-2021-04-06/>.

⁶⁹ R. Alton Gilbert, *Requiem for Regulation Q: What It Did and Why It Passed Away*, 68 ST. LOUIS FEDERAL RESERVE BANK REVIEW 22 (1986).

⁷⁰ *Id.* at 26.

⁷¹ Securities and Exchange Commission, *Fact Sheet: Reforming Money Market Funds* (Jun. 5, 2013), available at <https://www.sec.gov/opa/Article/press-release-2013-101---related-materials.html>.

akin to bank depositors not being able to withdraw the full value of their deposits. Breaking the buck can unleash a market-wide panic as investors rush to sell their shares.

Such a market-wide panic occurred in 2008. Following Lehman's bankruptcy declaration on September 15, 2008, a money market fund named the Reserve Primary Fund broke the buck on September 16, 2008, due to its exposure to debt issued by Lehman Brothers,⁷² leading many investors to pull their money out of the fund. That same week, prime institutional money market funds experienced substantial redemptions, with investors withdrawing approximately \$300 billion (14 percent of their assets).

Runs on money market funds can destabilize the entire short-term credit market.⁷³ When a money market fund is inundated with redemption requests in a panic, the fund may have insufficient cash to meet the redemptions. The fund may seek to raise cash by declining to roll over its maturing holdings of commercial paper or other short-term claims, or by selling its assets in illiquid markets at fire sale prices. These actions by money market funds reduce the supply of short-term credit in the economy, raise the price of short-term credit, and drive down the market values of short-term debt instruments in the financial system—thus creating additional pressures on money market funds, other investors in the short-term funding markets, and borrowers in these markets. This is precisely what occurred in September 2008.⁷⁴

In order to stop the outflows from spiraling out of control and crippling the financial system, the government undertook two unprecedented emergency actions. On September 19, 2008, the Treasury Department announced a guaranty program for money market funds, analogous to providing deposit insurance in order to prevent depositors from running on a bank. The move was stunning. According to the initial announcement:

The U.S. Treasury Department today announced the establishment of a temporary guaranty program for the U.S. money market mutual fund industry. For the next year, the U.S. Treasury will insure the holdings of any publicly offered eligible money market mutual fund – both retail and institutional – that pays a fee to participate in the program.

President George W. Bush approved the use of existing authorities by Secretary Henry M. Paulson, Jr. to make available as necessary the assets of the Exchange Stabilization Fund for up to \$50 billion to guarantee the payment in the circumstances described below.⁷⁵

⁷² Burcu Duygan-Bump, Patrick Parkinson, Eric Rosengren, Gustavo A. Suarez & Paul Willen, *How Effective Were the Federal Reserve Emergency Liquidity Facilities? Evidence from the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility*, 68 J. FIN. 715 (2013).

⁷³ See Van Der Weide & Zhang, *supra* note 13.

⁷⁴ *Id.*

⁷⁵ U.S. Treasury Press Release, *Treasury Announces Guaranty Program for Money Market Funds* (Sep. 19, 2008), available at <https://www.treasury.gov/press-center/press-releases/Pages/hp1147.aspx>.

A week later, the Treasury Department released additional details of its guarantee program:

All money market mutual funds that are regulated under Rule 2a-7 of the Investment Company Act of 1940, maintain a stable share price of \$1, and are publicly offered and registered with the Securities and Exchange Commission will be eligible to participate in the program. Treasury first announced this program on Friday, September 19.

The temporary guarantee program provides coverage to shareholders for amounts that they held in participating money market funds as of the close of business on September 19, 2008. The guarantee will be triggered if a participating fund's net asset value falls below \$0.995, commonly referred to as breaking the buck.⁷⁶

In addition, on September 19, 2008, the Federal Reserve authorized the establishment of the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (“AMLF”).⁷⁷ Under the AMLF, the Federal Reserve provided non-recourse loans to U.S. banking firms secured by high-quality asset-backed commercial paper purchased by the banking firm from a money market fund. The AMLF helped money market funds that held asset-backed commercial paper to meet investor demands for redemptions. Without additional liquidity for money market funds, forced sales of commercial paper would have further depressed the price of short-term debt securities and further raised the price of short-term funding in the U.S. financial system.

C. The 2020 Run on Money Market Funds

After the 2008 episode, regulators at the SEC understood the need for structural reform. In 2014, the SEC implemented reforms that required prime institutional money market funds to “float their NAV” (*i.e.*, no longer maintain a stable price) and provide non-government money market funds with new tools like liquidity fees and redemption gates to address runs.⁷⁸ The structural reforms took effect on October 14, 2016.

However, these structural reforms did not address the underlying issue: redemptions are essentially demand deposits and, as demonstrated by history, runs on deposits did not stop until FDIC insurance was implemented.⁷⁹ Not surprising, when market volatility spiked again, investors lined up for redemptions.

In March 2020, as volatility spread through global markets because of COVID-19, investors requested substantial redemptions from prime and tax-exempt money market funds in the belief that these funds would not be able to honor their redemption requests at full value.⁸⁰

⁷⁶ U.S. Treasury Press Release, *Treasury Announces Temporary Guarantee Program for Money Market Funds* (Sep. 29, 2008), available at <https://www.treasury.gov/press-center/press-releases/Pages/hp1161.aspx>.

⁷⁷ See Van Der Weide & Zhang, *supra* note 13.

⁷⁸ SEC, Money Market Funds, available at <https://www.sec.gov/spotlight/money-market.shtml>.

⁷⁹ See Gorton, *supra* note 18.

⁸⁰ U.S. Treasury Press Release, *President's Working Group on Financial Markets Releases Report on Money Market Funds*, available at <https://home.treasury.gov/news/press-releases/sm1219>. See also Lei Li, Yi Li, Marco

The Federal Reserve had to step in once again. With the approval of the Treasury Secretary, the Federal Reserve established the Money Market Mutual Fund Liquidity Facility (“MMLF”) on March 18, 2020.⁸¹ The 2008 version of the emergency facility provided non-recourse loans to U.S. banking firms secured by high-quality asset-backed commercial paper purchased by the banking firm from a money market fund. The MMLF operated in a similar fashion, except that the Federal Reserve benefited from \$10 billion of credit protection provided by the Treasury Department’s Exchange Stabilization Fund and thus was able to expand the eligible collateral set from asset-backed commercial paper to a much wider array of short-term debt securities.

Two runs in twelve years. Policymakers can learn a couple of lessons from studying money market funds. First, given the fact that stablecoin issuers are essentially taking deposits, holders of stablecoins will run when market volatility spikes. In fact, we have already seen this occur. Second, one way to eliminate contagion-inducing runs is to bring stablecoin issuers within the regulatory perimeter for deposit-taking institutions. As the market for stablecoins grows and become more systemically important, runs on stablecoin issuers could destabilize the financial system similar to runs on money market funds in both 2008 and 2020.⁸²

Part III. The Free Banking Era of the 19th Century

This Part describes the experience of privately produced money during the Free Banking Era of the 19th century. There are three main takeaways from our historical experience. First, the use of private bank notes was a failure because they did not satisfy the NQA principle. Second, the U.S. government took control of the monetary system under the National Bank Act. Third, runs on demand deposits only ended with deposit insurance in 1934.

A. The Creation of Private Money

The closest analogy to stablecoins is found in the Free Banking Era, when entry into banking was relatively easy and banks could issue their own banknotes. As shown in the table below,⁸³ starting in 1837, some states changed the way that bank charters were granted.⁸⁴ These states allowed free banking—that is, anyone could open a bank. However, there were rules.

Macchiavelli & Xing Zhou, *Liquidity Restrictions, Runs, and Central Bank Interventions: Evidence from Money Market Funds* (May 2021), available at <https://ssrn.com/abstract=3607593>.

⁸¹ See Van Der Weide & Zhang, *supra* note 13.

⁸² Federal Reserve Chair Jerome Powell has said, “Really the question is stablecoins, and my point with stablecoins is they’re like money funds, they’re like bank deposits, and they’re growing incredibly fast but without appropriate regulation... And if we’re going to have something that looks just like a money-market fund or bank deposit ... we really ought to have appropriate regulation and today we don’t.” Reuters, *Fed’s Powell ‘Legitimately Undecided’ on Central Bank Digital Currency* (Jul. 15, 2021), available at <https://www.reuters.com/business/finance/feds-powell-says-hes-undecided-central-bank-digital-currency-2021-07-15/>.

⁸³ The information presented in this table is from Rockoff, *infra* note 87, as compiled by Rolnick and Weber, *infra* note 87.

⁸⁴ See Kenneth Ng, *Free Banking Laws and Barriers to Entry in Banking, 1838-1860*, 48 JOURNAL OF ECONOMIC HISTORY 877 (1988); Andrew Economopoulos & Heather O’Neill, *Bank Entry during the Antebellum Period*, 27 JOURNAL OF MONEY, CREDIT AND BANKING 1071 (1995).

Banks had to back their note issuance one-for-one with state bonds that were deposited with the state treasurers (the banks received the coupons from these bonds). Each state specified the exact bonds that were eligible to back notes.

Table 4: Free Banking States and Chartered Banking States

Free Banking States	Year Free Banking Law Passed	States without Free Banking
Michigan	1837	Arkansas
Georgia	1838	California
New York	1838	Delaware
Alabama	1849	Kentucky
New Jersey	1850	Maine
Illinois	1851	Maryland
Massachusetts	1851	Mississippi
Ohio	1851	Missouri
Vermont	1851	New Hampshire
Connecticut	1852	North Carolina
Indiana	1852	Oregon
Tennessee	1852	Rhode Island
Wisconsin	1852	South Carolina
Florida	1853	Texas
Louisiana	1853	Virginia
Iowa	1858	
Minnesota	1858	
Pennsylvania	1860	

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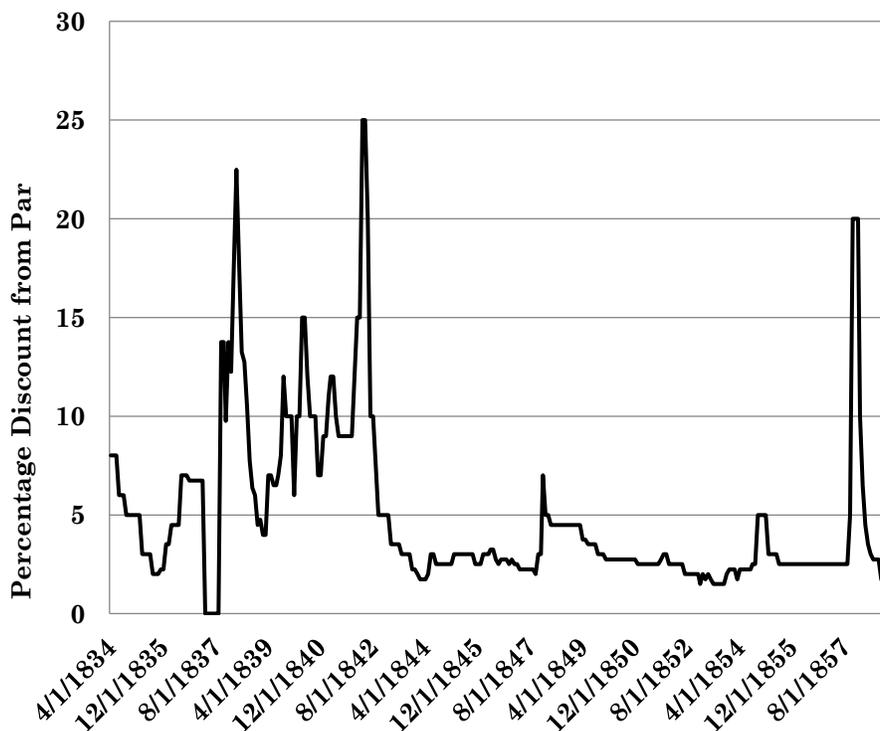
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These private bank notes circulated as money, as the alternative was a bewildering array of different coins from around the world. But, the private bank notes, whether issued by chartered banks or free banks, did not trade at par away from the issuing bank. For example, a note issued by a bank in Tennessee might circulate at a 20 percent discount in Philadelphia, as shown in Figure 1 below.⁸⁵ The discounts were in bank note reporters, weekly newspapers

⁸⁵ The data are from Gary Gorton & Warren E. Weber, *Quoted Discounts on State Bank Note Discounts in Philadelphia, 1832-1858*, Federal Reserve Bank of Minneapolis Dataset (Apr. 3, 2018), available at <https://researchdatabase.minneapolisfed.org/concern/datasets/2801pg356>.

that were in all major cities (see picture above). The prices reported were secondary market prices. If a store took in notes from banks all over the country, that store would sell them to note brokers who made markets in these notes.

Figure 1: Planters Bank of Tennessee Note Discount in Philadelphia



For many years, the literature asserted that there were wildcat banks during this period. These were banks that either (1) did not deposit the requisite bonds, or (2) in some states, where bonds were valued at par and not market value, defrauded the public by issuing notes that they would never redeem in specie (gold or silver).⁸⁶ Counterfeiting was a big problem, but the system was not chaos. Bank failures were not due to wildcat banking as has often been alleged.⁸⁷ In fact, it functioned well from the point of view of efficient market theory.⁸⁸ A bank note was a perpetual, zero-coupon, bond with an embedded put option to redeem the note for specie on demand at the issuing bank. From the put option, the implied volatility can

⁸⁶ See Arthur Rolnick & Warren Weber, *Free Banking, Wildcat Banking and Shinplasters*, Federal Reserve Bank of Minneapolis Quarterly Review (Fall 1982), available at <https://www.minneapolisfed.org/research/quarterly-review/free-banking-wildcat-banking-and-shinplasters>.

⁸⁷ See Hugh Rockoff, *The Free Banking Era: A Reexamination*, 6 JOURNAL OF MONEY CREDIT AND BANKING 141 (1974); Arthur Rolnick & Warren Weber, *The Causes of Free Bank Failures: A Detailed Examination*, 14 JOURNAL OF MONETARY ECONOMICS 267 (1984).

⁸⁸ See Gary Gorton, *Pricing Free Bank Notes*, 44 JOURNAL OF MONETARY ECONOMICS 33 (1999); Gary Gorton, *Reputation Formation in Early Bank Note Markets*, 104 JOURNAL OF POLITICAL ECONOMY 346 (1996).

be calculated. This is a measure of risk, and it correlates well with various characteristics of the different states.

The market was an “efficient market” in the sense of financial economics, but varying discounts made actual transactions (and legal contracting) very difficult. It was not economically efficient. There was constant haggling and arguing over the value of notes in transactions. Private bank notes were hard to use in transactions. Here’s an explanation from a 19th century source:

It is difficult for the modern student to realize that there were hundreds of banks whose notes circulated in any given community. The bank-notes were bits of paper recognizable as a species by shape, color, size and engraved work. Any piece of paper which had these came with the prestige of money; the only thing in the shape of money to which the people were accustomed. The person to whom one of them was offered, if unskilled in trade and banking, had little choice but to take it. A merchant turned to his ‘detector.’ He scrutinized the worn and dirty scrap for two or three minutes, regarding it was more probably ‘good’ if it were worn and dirty than if it was clean, because those features were proof of long and successful circulation. He turned it up to the light and looked through it, because it was the custom of the banks to file the notes on slender pins which made holes through them. If there were many such holes the note had been often in bank and its genuineness was ratified. All the delay and trouble of these operations were so much deduction from the character of the notes as current cash. A community forced to do its business in that way had no money. It was deprived of the advantages of money.⁸⁹

In other words, the NQA principle was violated. Without NQA, the community had no money. Stablecoins that do not satisfy this principle also will not be able to serve as money in transactions.

B. The National Bank Act

The National Bank Act was passed in 1863, establishing national banks in the United States. These banks could issue national bank notes, but they had to be backed with U.S. Treasury bonds deposited with the U.S. Treasury. Subsequent legislation imposed a prohibitively high tax on bank notes other than national bank notes. In other words, the era of privately issued bank notes was over. For the first time in U.S. history, there was a uniform currency that satisfied the NQA principle.⁹⁰

⁸⁹ William Graham Sumner, *A HISTORY OF BANKING IN THE UNITED STATES* (1896).

⁹⁰ This is essentially the route the Peoples Bank of China has taken with respect to cryptocurrencies; they are all prohibited in favor of the PBOC’s central bank digital currency. See Omkar Godbole, *China Says Banks Must Block Crypto Transactions*, Coin Desk (Jun. 21, 2021), available at <https://www.coindesk.com/pboc-says-banks-must-block-crypto-transactions>.

The creation of a uniform national currency was economically efficient. Xu and Yang “find that the composition of agricultural production shifted from non-traded crops to traded crops and that employment in trade-related professions and businesses grew. Counties with access to national banks also saw significant manufacturing output growth that was primarily driven by sourcing more inputs. These higher levels of manufacturing output persisted for two decades.”⁹¹ In fancier vernacular, the United States became an optimal currency area (“OCA”). According to Brunnermeier, James, and Landau: “An OCA is typically characterized by geographic proximity and the ability of participants to dispense of the exchange rate as an adjustment tool. In turn, that implies some commonality of macroeconomic shocks and a sufficient degree of factor mobility.”⁹²

The National Bank Act, however, did not end banking panics. These occurred during the National Banking Era, but the runs were on demand deposits, not bank notes.⁹³ Demand deposits paid interest and they grew significantly even before the Civil War.⁹⁴ The table below shows the dates of the banking panics prior to the Federal Reserve System.⁹⁵ Then, of course, there were the panics during the Great Depression, peaking in March 1933. Afterward, we experienced about 75 years before the global financial crisis.

⁹¹ See Chenzi Xu and He Yang, *Monetizing the Economy: National Banks and Local Economic Development*, Stanford GSB Working Paper (Feb. 2021), available at https://chenzi-xu.com/docs/nationalbanks_xu_yang.pdf; see also Matthew Jaremski, *National Banking's Role in U.S. Industrialization, 1850–1900*, 74 JOURNAL OF ECONOMIC HISTORY 109 (2014).

⁹² Markus Brunnermeier, Harold James & Jean-Pierre Landau, *Digital Currency Areas*, VOX (Jul. 3, 2019), available at <https://voxeu.org/article/digital-currency-areas>. The concept of an optimal currency area is due to Robert Mundell, *A Theory of Optimum Currency Area*, 51 AMERICAN ECONOMIC REVIEW 657 (1961).

⁹³ See Gary Gorton, *Banking Panics and Business Cycles*, 40 OXFORD ECONOMIC PAPERS 751 (1988).

⁹⁴ This was, in part, due to a design problem with the National Bank Act, which did not recognize that U.S. Treasury bonds also have a convenience yield. See Gary Gorton, Toomas Laarits & Tyler Muir, *Mobile Collateral versus Immobile Collateral*, JOURNAL OF MONEY, CREDIT AND BANKING (forthcoming).

⁹⁵ The data in Table 6 are from Charles Calomiris & Gary Gorton, *The Origins of Banking Panics: Models, Facts, and Bank Regulation*, FINANCIAL MARKETS AND FINANCIAL CRISES, ed. Glenn Hubbard (1991).

Table 5: Banking Panics and Business Cycles

Height of Panic	Nearest Peak	Comments
August 1814 – January 1817	January 1812	War-related
April – May 1819	November 1818	
May 1837	April 1837	
October 1839 – March 1842	March 1839	
October 1857	May 1857	
December 1861	September 1860	War-related
September 1873	September 1873	
May 1884	May 1884	
November 1890	November 1890	
June – August 1893	April 1893	
October 1896	March 1896	
October 1907	September 1907	
August – October 1914	May 1914	War-related

C. The Legal Basis to Create and Regulate Money

How did the government enact such significant reforms to the monetary system? It was not without controversy. Article I, Section 8 of the United States Constitution enumerates the many powers that Congress possesses, including the power to “coin money, regulate the value thereof, and of foreign coin, and fix the standard of weights and measures.” There are, however, two important follow-up questions: (1) Can Congress create a currency that’s the only game in town by taxing privately created currencies out of existence? The answer is “yes,” as decided by the Supreme Court based on facts that emerged during and after the Civil War. (2) Can Congress create a fiat currency that is not backed by gold or silver? The answer also is “yes,” based on the Supreme Court’s *Legal Tender Cases*. We briefly discuss each in turn.

1. Singular National Currency

Congress passed the National Bank Act in 1863 to help finance the Civil War. As described above, national banks were chartered and allowed to issue a uniform national currency. Uptake was not immediate, as many stayed with using state bank notes. Subsequent legislation required *all* banks to pay a 10 percent tax on payments that they made in currency notes other than national bank notes:

That every national banking association, state bank, or state banking association shall pay a tax of ten percentum on the amount of notes of any person, state bank, or state banking association used for circulation and paid out by them after the 1st day

of August, 1866, and such tax shall be assessed and paid in such manner as shall be prescribed by the Commissioner of Internal Revenue.⁹⁶

The constitutionality of the tax came before the Supreme Court in *Veazie Bank v. Fenno*,⁹⁷ a case brought by a state-chartered bank in Maine that issued its own bank notes subject to the tax. The bank refused to pay the 10-percent tax, alleging it to be unconstitutional on two fronts: “The first is that the tax in question is a direct tax, and has not been apportioned among the states agreeably to the Constitution. The second is that the act imposing the tax impairs a franchise granted by the state, and that Congress has no power to pass any law with that intent or effect.”⁹⁸ In a six-two decision, the Court determined that Congress had the authority to tax the bank notes and that it was not a direct tax. If it had been a direct tax, its incidence would have had to be “apportioned among the several states, according to their respective numbers.” Importantly, the Court also stated:

Having thus, in the exercise of undisputed constitutional powers, undertaken to provide a currency for the whole country, it cannot be questioned that Congress may constitutionally secure the benefit of it to the people by appropriate legislation. To this end, Congress has denied the quality of legal tender to foreign coins, and has provided by law against the imposition of counterfeit and base coin on the community. *To the same end, Congress may restrain by suitable enactments the circulation as money of any notes not issued under its own authority.* Without this power, indeed, its attempts to secure a sound and uniform currency for the country must be futile.⁹⁹

Thus, Congress has the authority to issue a uniform currency and to impose a tax on competing currencies to ensure that its uniform currency is successfully adopted.

2. Fiat Currency

Almost everyone takes this for granted now, but Congress also has the ability to issue fiat currency—that is, currency not backed by specie. In its efforts to finance the Civil War, the government passed the Legal Tender Act in 1862, which authorized the creation of paper money not redeemable in specie (the “greenbacks”). This was controversial because this new paper money had to be accepted for all taxes, debts, and other obligations, even those contracted *prior* to 1862. In *Hepburn v. Griswold*, the Court ruled by a four-to-three majority that Congress lacked the power to make the notes legal tender, as it violated Fifth Amendment guarantees against deprivation of property without due process of law.¹⁰⁰ Following the decision, an apparently displeased President Ulysses S. Grant sent the

⁹⁶ Congress passed this law on July 13, 1866. Richard H. Timberlake, *CONSTITUTIONAL MONEY: A REVIEW OF THE SUPREME COURT’S MONETARY DECISIONS* (2013).

⁹⁷ 75 U.S. 533 (1869).

⁹⁸ *Id.* at 540.

⁹⁹ *Id.* at 549 (emphasis added).

¹⁰⁰ 75 U.S. 603 (1870).

nominations of two new justices to the Senate for confirmation—Justices Joseph P. Bradley and William Strong.¹⁰¹ During its next session, the Supreme Court reversed its prior decision in *Hepburn v. Griswold*. Specifically, in *Knox v. Lee* and *Parker v. Davis*,¹⁰² the Supreme Court held that making paper money the legal tender of the land did not conflict with Article I of the U.S. Constitution.

Part IV. Policy Choices

Based on historical lessons, the government has a couple of options: (1) transform stablecoins into the equivalent of public money by (a) requiring stablecoins to be issued through FDIC-insured banks or (b) requiring stablecoins to be backed one-for-one with Treasuries or reserves at the central bank; or (2) introduce a central bank digital currency and tax private stablecoins out of existence.

A. Transform Private Money into Public Money

Choosing the first option would effectively turn stablecoins into public money. One way to achieve this outcome is to bring stablecoin issuers within the insured-bank regulatory perimeter. Another way to achieve this outcome is to require stablecoins to be backed one-for-one by Treasuries or central bank reserves. Stablecoins cannot become “money” until this occurs. Indeed, their prices would have fluctuating discounts based on varying perceptions of their risks—back in the Free Banking Era and in violation of the NQA principle.

If stablecoins are to be transformed into public money, then updates or modifications to the regulatory infrastructure would have to be made. We discuss a few here, which involve the Glass-Steagall Act, the Dodd-Frank Act, and new legislation from Congress.

1. Section 21 of the Glass-Steagall Act

Most are unaware of the fact that section 21 of the Glass-Steagall Act is still on the books. It was not repealed by the many deregulatory statutes since 1933. Under section 21 of the Glass-Steagall Act, it is unlawful for a non-bank entity to engage in deposit-taking.¹⁰³ The Department of Justice has the authority to interpret section 21 of the Glass-Steagall Act, and has opined on this issue before in the context of money market funds. As discussed above, in 1979, the Department of Justice stated that depositors are creditors whereas holders of money market fund shares are equity owners. The investor’s ability to redeem shares is simply a way to transfer ownership, not to transform the investor into a creditor.

The Department of Justice’s 1979 interpretation is consistent with a view that some stablecoins are deposits. Importantly, the holders of many stablecoins are *not* equity owners of the stablecoin issuer. They are a creditor of their depository—for instance, an explicit contract stating 1,000 stablecoins for 1,000 U.S. dollars. Therefore, one avenue to regulate many stablecoin issuers is for the Department of Justice to update and publicize their

¹⁰¹ Timberlake, *supra* note 96.

¹⁰² 79 U.S. 457 (1871).

¹⁰³ 12 U.S.C. § 378(a)(2).

interpretation of section 21 of the Glass-Steagall Act. The result would be that some stablecoin issuers are in violation of section 21 of the Glass-Steagall Act *as it exists today*. This would not ban the existence of those stablecoins, but it would force those stablecoin issuers to conduct their business within an FDIC-insured bank, which is what Facebook is now doing with its stablecoin, Diem.¹⁰⁴

This proposal does have shortcomings. First, not all stablecoins are redeemed via debt contracts. The ones that are modeled after money market funds—with equity contracts instead of debt contracts—would be excluded just like money market funds. Second, this interpretation could have ramifications beyond stablecoin issuers. It could impact e-money payment platforms as well. The defining feature of modern payment platforms is that they issue multi-purpose monetary liabilities that are close functional substitutes for conventional bank deposits. This includes other bank-like entities such as PayPal, Venmo, WeChat Pay, and AliPay. These platforms accept cash, checks, and electronic funds transfers in exchange for the issuance of monetary liabilities. And they allow customers to make and receive multiple payments. This can involve accumulating positive balances—akin to deposits in a bank. Thus, depending on the specifics on the interpretation, these payments platforms also could be brought within the regulatory perimeter.

2. Title VIII of the Dodd-Frank Act

During the 2008 global financial crisis, regulators learned that weaknesses in the nonbanking sphere (*e.g.*, insurance companies and investment banks) could impact the broader financial sector. When the housing bubble burst, nonbanks like Bear Stearns, Lehman Brothers, and AIG were among the first firms to fail, triggering the broader panic.¹⁰⁵ None of these companies was subject to significant consolidated oversight or regulation. In Title I of the Dodd-Frank Act, Congress created the Financial Stability Oversight Council (“FSOC”) to combat the risk of systemic nonbank financial companies.

The FSOC is composed of ten voting members and five nonvoting members. The voting members are the Secretary of the Treasury, the Chair of the Board of Governors of the Federal Reserve System, the Comptroller of the Currency, the Director of the Consumer Financial Protection Bureau, the Chair of the Securities and Exchange Commission, the Chairman of the Federal Deposit Insurance Corporation, the Chairman of the Commodity Futures Trading Commission, the Director of the Federal Housing Finance Agency, the Chairman of the National Credit Union Administration, and an independent member with insurance expertise who is appointed by the President, by and with the advice and consent of the Senate. The five nonvoting members are the Director of the Office of Financial

¹⁰⁴ Nikhilesh De, *Facebook-backed Diem Partners with Silvergate Bank to Issue US Dollar Stablecoin*, COIN DESK (May 12, 2021), available at <https://www.coindesk.com/facebook-backed-diem-partners-with-silvergate-bank-to-issue-us-dollar-stablecoin>.

¹⁰⁵ Jeremy Kress, *The Last SIFI: The Unwise and Illegal Deregulation of Prudential Financial*, 71 STAN. L. REV. ONLINE 171 (2018).

Research, the Director of the Federal Insurance Office, and state insurance, banking, and securities regulators.¹⁰⁶

The FSOC could designate stablecoin issuance as a systemic *payment activity* under Title VIII of the Dodd-Frank Act. The statute states:

The purpose of this subchapter is to mitigate systemic risk in the financial system and promote financial stability by—

- (1) authorizing the Board of Governors to promote uniform standards for the—
 - (A) management of risks by systemically important financial market utilities; and
 - (B) conduct of systemically important *payment*, clearing, and settlement *activities* by financial institutions;
- (2) providing the Board of Governors an enhanced role in the supervision of risk management standards for systemically important financial market utilities;
- (3) strengthening the liquidity of systemically important financial market utilities; and
- (4) providing the Board of Governors an enhanced role in the supervision of risk management standards for systemically important payment, clearing, and settlement activities by financial institutions.¹⁰⁷

FSOC designation would give the Federal Reserve the authority to regulate the activity of stablecoin issuance by any financial institution. The Federal Reserve could then require stablecoins to be issued from FDIC-insured banks or require stablecoin issuers to hold cash reserves at the Federal Reserve one-for-one (*i.e.*, transform stablecoins into public money).

There are two potential shortcomings with this approach. The first is that some would argue stablecoins are currently *not* systemically important. While that might be right, there's no doubt that the stablecoins industry is growing rapidly and that FSOC has the ability to designate payment activities that “are, or are likely to become, systemically important.”¹⁰⁸ The second is that the FSOC designation process is not airtight. FSOC had previously designated MetLife as a systemically important financial institution, and a federal district court judge ruled that the designation was arbitrary and capricious.¹⁰⁹

3. New Legislation

The previous approach of using FSOC designation to issue stablecoins out of insured banks or back stablecoins one-for-one with central bank reserves can be accomplished another way. Congress can pass legislation that essentially transforms stablecoins into public money.

¹⁰⁶ U.S. Treasury, *Nonbank Designations – FAQs*, available at <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/fsoc/designations/nonbank-designations-faqs>.

¹⁰⁷ 12 U.S.C. § 5461(b).

¹⁰⁸ 12 U.S.C. § 5463.

¹⁰⁹ *MetLife Inc. v. Financial Stability Oversight Council*, 177 F. Supp. 3d 219 (D.D.C. 2016).

For example, Congress could pass legislation that requires stablecoin issuers to become FDIC-insured banks or to run their business out of FDIC-insured banks. As a result, stablecoin issuers would be subject to regulations and supervisory activities that come along with being an FDIC-insured bank. Congress could tailor the suite of regulations and supervisory activities. Some believe that the suite of regulations that go along with a regular bank charter would be too onerous since stablecoin issuers only operate in the money market space of taking deposits and facilitating payments. In their minds, the ideal outcome would be subjecting stablecoin issuers to the regulations corresponding to a narrow bank charter—for example, limiting the assets of stablecoin issuers to only central bank reserves or short-term U.S. Treasuries in exchange for being exempt from certain parts of standard bank regulation.

Congress also could pursue a more comprehensive and aggressive approach that would not only target stablecoin issuers but would fix the underlying definitions related to banking that have created sub-optimal regulatory arbitrage for decades. Doing so would have the benefit of adapting to technological development. Stablecoins will not be the last attempt to create private money with new technology. But the fundamental economic concepts remain identical—namely, if an entity is offering a business that is essentially equivalent to taking deposits, then regulate that entity like a bank and require it to obtain deposit insurance.

Recall that money market funds were deemed by the Department of Justice to not be in the business of taking deposits because the redemption process was based upon exchanging equity instead of debt. The Department of Justice’s technical distinction between equity and debt changed the course of financial history. Learning from that mistake, Congress could scope in *all forms of runnable* financial instruments that are *functionally equivalent* to deposits.¹¹⁰ Congress should assert that the term “deposits” includes *any* financial instruments that are redeemable on demand or within a very short time period, irrespective of its status as equity or debt.

In addition, Congress could clarify the term “commercial lending.” In the *Dimension* case, the Supreme Court argued that “money market transactions undoubtedly involve the indirect extension of credit to commercial entities but, because they do not entail the face-to-face negotiation of credit between borrower and lender, are not ‘commercial loans.’”¹¹¹ Therefore, as understood by Supreme Court Justices in the 1980s, buying corporate debt securities was not commercial lending. The “face-to-face negotiation” standard is untenable in the modern financial system. Every financial economist would agree that if a corporation needed to borrow money, it could either go directly to a bank for a loan or issue debt in the broader credit markets. Whether the contract was negotiated face-to-face or not is irrelevant.

¹¹⁰ John Crawford, *A Better Way to Revive Glass-Steagall*, 70 STAN. L. REV. ONLINE 1 (2017). See also Arthur E. Wilmarth, Jr., *TAMING THE MEGABANKS: WHY WE NEED A NEW GLASS-STEAGALL ACT* (2020).

¹¹¹ See discussion in Part I, *supra*.

By harmonizing the legal definitions with the standard definitions understood by financial economists, Congress could bring both stablecoin issuers and money market funds inside the bank regulatory perimeter. Of course, such a legislative change—particularly given its impact on the multi-trillion-dollar money market fund industry—would be met with resistance. Critics would allege that these financial entities provide credit to the broader economy and additional regulations would reduce their ability to provide that credit. That is true, but the benefits outweigh the costs. In both 2008 and 2020—when market volatility spiked due to the failure of Lehman Brothers and the onset of COVID-19, respectively—“depositors” lost confidence that money market funds could maintain the implicit contract and so they rushed to redeem their shares for cash.¹¹² Facing surges in redemptions, money market funds had to fire sell their assets, which sent short-term funding markets into disarray and sent contagion spreading throughout the financial system. Both times, the U.S. Treasury and the Federal Reserve had to step in to backstop the money market fund industry. The benefit of increased financial stability would be tremendous.

Finally, having Congress implement legislation is important for another reason. The status quo will result in substantial regulatory fragmentation. As discussed previously, the OCC and state banking regulators have already started to experiment—pursuing ways to provide access to some advantages of being a bank, while limiting the amount of regulatory oversight and barriers to entry.

Going down the path of having multiple special charters and no uniform regulatory framework would be the least desirable outcome. (It really would be the Free Banking Era again.) A major issue that’s pointed out again and again by scholars and policymakers who evaluate the U.S. regulatory framework is the sub-optimally high level of fragmentation among state agencies, among federal agencies, and between state and federal agencies. While fragmentation may lead to unexpected experiments to evaluate which policies are superior, it also leads to regulatory arbitrage. It’s easier for financial institutions to cherry pick the most lenient regulators and supervisors. Financial entities shopped for the best regulators in the lead-up to the 2008 global financial crisis, as the Office of Thrift Supervision found itself providing consolidated supervision over massive entities like General Electric, AIG, American Express, and Morgan Stanley.¹¹³ Thus, having a uniform national framework is imperative.

¹¹² See Lawrence Schmidt, Allan Timmermann & Russ Wermers, *Runs on Money Market Mutual Funds*, 106 AMERICAN ECONOMIC REVIEW 2625 (2016); Patrick McCabe, *The Cross Section of Money Market Fund Risks and Financial Crises*, Federal Reserve Working Paper 2010-51 (Sep. 2010), available at <https://www.federalreserve.gov/pubs/feds/2010/201051/201051pap.pdf>.

¹¹³ Dain C. Donelson & David Zaring, *Requiem for a Regulator: The Office of Thrift Supervision’s Performance During the Financial Crisis*, 89 N.C. L. REV. 1777 (2010).

B. Replace Private Digital Money with Public Digital Money

If stablecoins are not transformed into public money, there is an alternative way to tackle the associated risks. Congress could require the Federal Reserve to issue a central bank digital currency as a substitute to privately produced digital money like stablecoins.¹¹⁴

Countries will not use paper and metal coins forever. In the 19th century, as the form of money evolved, the federal government instituted a uniform national currency via the National Bank Act and then taxed the remaining privately produced money out of existence. The present-day analogue is for the federal government to create a central bank digital currency. The question then becomes whether policymakers would want to have central bank digital currencies coexist with stablecoins or to have central bank digital currencies be the only form of money in circulation. As discussed previously, Congress has the legal authority to create a fiat currency and to tax competitors of that uniform national currency out of existence.

1. Benefits of Digital Currency

The benefits of implementing a central bank digital currency are to increase the convenience yield, reduce the costs of payment systems, and maintain monetary sovereignty. These benefits are distinct from facilitating monetary policy issues like breaking through the zero lower bound or fiscal policy issues like targeting helicopter drops of money.¹¹⁵

With respect to the convenience yield, a retail central bank digital currency should make it possible to lower the costs resulting from the time spent getting to a cash delivery point, withdrawing money, and then using it to make payments. Funds could be transferred from a bank account, credit card, or other payment service to the central bank digital currency wallet via a phone. No more long waits to move money cross-border. Conversely, a user could convert a central bank digital currency at par into any other form of money. Simply put, a central bank digital currency would enhance the convenience yield because it would be more efficient than paper currency and coins.

The largest benefits would accrue to the wholesale market. The 2008 global financial crisis revealed the size of the wholesale banking market. Global supply chains and global banking are very large, and gross capital flows have grown enormously in the past three decades.¹¹⁶ Yet cross-border transactions are currently exceedingly slow because of various hurdles.

¹¹⁴ A central bank digital currency is a digital asset—tokenized on a blockchain—that only the central bank may issue or destroy. It is traded at par against banknotes and reserves. Central bank digital currency tokens are analogous to paper currency, as direct claims on the central bank, but are transferred electronically. Token holdings are recorded in ledger accounts maintained by the central bank or by payment service providers.

¹¹⁵ See, e.g., Julia Coronado & Simon Potter, *Securing Macroeconomic and Monetary Stability with a Federal Reserve-backed Digital Currency*, PIIIE POLICY BRIEF 20-4 (Mar. 2020), available at <https://www.piie.com/publications/policy-briefs/securing-macroeconomic-and-monetary-stability-federal-reserve-backed>.

¹¹⁶ See, e.g., Maurice Obstfeld, *Financial Flows, Financial Crises, and Global Imbalances*, 31 JOURNAL OF INTERNATIONAL MONEY AND FINANCE 469 (2012); Stefan Avdjiev, Bryan Hardy, Sebnem Kalemli-Ozcan & Luis Servén, *Gross Capital Flows by Banks, Corporates and Sovereigns*, BIS Working Papers No. 760 (Dec. 4, 2018), available at <https://www.bis.org/publ/work760.htm>.

There is a lack of standardization across jurisdictions with respect to operating hours, data standards, and regulatory requirements. Banks are forced to rely on their correspondent bank network to facilitate a cross-border transaction. As a result, there are significant delays in payments processing, potentially leading up to waiting times of multiple days or even a week. A central bank digital currency would ease these difficulties. To be sure, there would have to be interoperability between the central bank digital currencies of all countries because foreign exchange conversions would still need to take place.

The second benefit of having a central bank digital currency is that payment systems are costly.¹¹⁷ The costs of making payments were estimated to be as much as 3 percent of GDP.¹¹⁸ In the Netherlands, the total cost of all point-of-sale payments was estimated to be 0.65 percent of GDP in 2002.¹¹⁹ Banks' costs payment services were estimated at 0.49 percent of GDP in Norway,¹²⁰ and 0.77 percent of GDP in Portugal.¹²¹ Finally, Schmiedel, Kostova, and Ruttenberg estimate the cost in EU countries was 1 percent of GDP.¹²² These figures clearly show that the costs related to payment activities are not negligible.

Third, the introduction of a central bank digital currency allows the government to maintain monetary sovereignty.¹²³ We discuss this next.

2. Coexistence Between Private and Public Currencies

Can privately produced stablecoins—ones that are not insured by the government and are not required to be backed one-for-one at the Federal Reserve—coexist with public money?¹²⁴

¹¹⁷ Report to the G20, *Central Bank Digital Currencies for Cross-Border Payments* (Jul. 2021), available at <https://www.bis.org/publ/othp38.pdf> (“CBDCs have the potential to enhance the efficiency of cross-border payments, as long as their design follows the ‘Hippocratic Oath for CBDC design’ and its premise to ‘do no harm.’”).

¹¹⁸ David Humphrey, Magnus Willeson, Ted Lindblom & Goran Bergendahl, *What Does It Cost to Make a Payment?*, 2 REVIEW OF NETWORK ECONOMICS 159 (2003).

¹¹⁹ Hans Brits & Carlo Winder, *Payments Are No Free Lunch*, De Nederlandsche Bank Working Paper (Oct. 2005), available at <https://www.dnb.nl/en/publications/research-publications/occasional-studies/nr-02-2005-payments-are-no-free-lunch/>.

¹²⁰ Olaf Gresvik and Grete Øwre, *Costs and Income in the Norwegian Payment System 2001. An Application of the Activity Based Costing Framework*, Norges Bank Working Paper No. 8/2003 (2003), available at <https://www.norges-bank.no/en/news-events/news-publications/Papers/Working-Papers/2003/20038/>.

¹²¹ Banco de Portugal, *Retail Payment Instruments in Portugal: Costs and Benefits* (Jul. 2007), available at <https://www.bportugal.pt/sites/default/files/anexos/pdf-boletim/study%20-%20july%202007.pdf>.

¹²² Heiko Schmiedel, Gergana Kostova & Wiebe Ruttenberg, *The Social and Private Costs of Retail Payment Instruments: A European Perspective*, European Central Bank Occasional Paper Series, No. 137 (Sept. 2012), available at <https://www.ecb.europa.eu/pub/pdf/scpops/ecbocp137.pdf>.

¹²³ Federal Reserve Chair Jerome Powell has remarked, “I think that may be the case and I think that’s one of the arguments that are offered in favor of digital currency... That, in particular, you wouldn’t need stablecoins, you wouldn’t need cryptocurrencies if you had a digital U.S. currency—I think that’s one of the stronger arguments in its favor.” Reuters, *Powell Says a Fed Digital Currency Could Undercut Need for Cryptocurrencies* (Jul. 14, 2021), available at <https://www.reuters.com/business/feds-powell-says-stablecoins-need-appropriate-regulatory-framework-2021-07-14/>.

¹²⁴ Note that if stablecoins were insured by the government or were required to be backed by cash or Treasuries, they would essentially become a national currency.

In other words, should the sovereign have a monopoly on money issuance? As shown by revealed preference in the table below,¹²⁵ the answer is yes. The provision of NQA money is a public good, which only the government can supply.¹²⁶

Table 6: Central Banks and Banknote Monopolies

Country	Central Bank Founded	Decision on Banknote Monopoly
Austria	1816	1816
Norway	1816	1818
Denmark	1818	1818
United Kingdom	1694	1844
France	1800	1848
Belgium	1850	1850
Netherlands	1814	1863
Spain	1874	1874
Germany	1876	1876
Japan	1882	1883
Finland	1811	1886
Portugal	1846	1888
Sweden	1668	1897
United States	1913	1913
Italy	1893	1926

The intuition for this result is quite straightforward. As David Ricardo put it:

In the use of money, everyone is a trader; those whose habits and pursuits are little suited to explore the mechanism of trade are obliged to make use of money, and are no way qualified to ascertain the solidity of different banks whose paper is in circulation; accordingly we find that men living on limited incomes, women, laborers, and mechanics of all descriptions, are often severe sufferers by the failure of country banks.¹²⁷

¹²⁵ Forrest Capie, Stanley Fischer, Charles Goodhart & Norbert Schnadt, *THE FUTURE OF CENTRAL BANKING* (1994).

¹²⁶ There have been instances when a government currency coexisted with private bank notes. For example, Fung, Hendry, and Weber study a period in Canada when both private bank notes and government notes were simultaneously in circulation. The private money did not achieve the NQA principle. The authors conclude that only government regulation can do that. Ben Fung, Scott Hendry & Warren E. Weber, *Canadian Bank Notes and Dominion Notes: Lessons for Digital Currencies*, BANK OF CANADA STAFF WORKING PAPER 2017-5 (2017), available at <https://www.bankofcanada.ca/2017/02/staff-working-paper-2017-5/>.

¹²⁷ *THE WORKS AND CORRESPONDENCE OF DAVID RICARDO*, ed., P. Sraffa. 11 vols. (1951-1973).

In other words, during transactions, agents have to determine the value of a unit of private money being offered. Not everyone can be sufficiently informed to make an accurate judgement. The uninformed—the “men living on limited incomes, women, laborers, and mechanics of all descriptions”—will be taken advantage of. This sentiment was expressed by Congress during the debate about the National Bank Act and taxing state-chartered bank notes:

The advantages of uniformity were not hidden from the states—men of that day who had been taught in the bitter school of experience what were the disadvantages of a mongrel currency. The great advantage to the business of the community of a uniform currency would lie in economy of exchange. This point was clearly made by Secretary Chase in his Report of 1861, when he recommended the system for the first time, and it was reiterated in his Report of 1862. Western people especially stood in need of a sound currency, both for use among themselves and in their transactions with eastern banks.¹²⁸

For all these reasons, the United States decided to have a single uniform sovereign currency in 1863.

3. Design of Digital Currency

Examining the many design parameters of central bank digital currencies is outside the scope of this article. But, in general, there are two ways to design a retail central bank digital currency. The first is as a digital currency token and the second is in the form of a deposit account with the central bank. We argue in favor of the former design and briefly discuss our rationale.

Under the first design option, a central bank digital currency would be issued as a digital currency token (*i.e.*, a digital version of physical cash). Thus, if you were to withdraw \$50 from your bank account, you could choose the \$50 to be either in the form of digital cash (on your phone or in your blockchain “wallet”) or physical cash.¹²⁹ As the BIS describes it, “Users could pay with a CBDC just as today, with a debit card, online banking tool or smartphone-based app, all operated by a bank or other private sector payment provider. However, instead of these intermediaries booking transactions on their own balance sheets as is the case today, they would simply update the record of who owns which CBDC balance. In this way, the central bank avoids the operational tasks of opening accounts and administering payments for users, as private sector intermediaries would continue to perform retail payment

¹²⁸ John Wilson Million, *The Debate on the National Bank Act of 1863*, 2 JOURNAL OF POLITICAL ECONOMY 251 (1894).

¹²⁹ The central bank would stand behind these two monies, one paper and one digital, and would exchange one for the other at par, as needed.

services.”¹³⁰ This is the most straightforward option and the least likely to cause unintended consequences.

The second design option would allow households and businesses to establish deposit accounts directly with the central bank. Such accounts have been labeled “FedAccounts.”¹³¹ One of the main arguments for FedAccounts is financial inclusion.¹³² In 2019, the FDIC reported that 5.4 percent of American households did not have a bank account, down from 8.2 percent in 2011.¹³³ Of these unbanked people, 48.9 percent reported that they did not have enough money to meet the minimum balance requirements of banks. The FDIC reports that: “About two-thirds of the decline in the unbanked rate between 2011 and 2019 was associated with improvements in the socioeconomic circumstances of U.S. households over this period.” There is a more direct way to address financial inclusion. For example, policymakers could require commercial banks to provide free, no-minimum accounts to users, or by limiting or eliminating fees. Better yet, fix the underlying problem of economic inequality, which should be addressed through fiscal policy rather than linking it to the central bank.¹³⁴

More importantly, what does the central bank do with all the money that is deposited into these accounts? The amount deposited depends on the interest rate offered. Whatever the rate, the Federal Reserve’s policy regarding this rate will affect the inflow and outflow of deposits (cash) at the central bank, a complication because it amounts to an open market operation. In addition, the amounts that flow into these accounts would be very large—hundreds of billions, or even trillions, of dollars. Money in bank deposit accounts, money market funds, repo, commercial paper, and so on could all go into the central bank. The Federal Reserve would buy securities with this money, but there are not enough Treasuries because Treasuries are desired by the U.S. private sector for their convenience yield.¹³⁵ This means that the Federal Reserve would have to buy other securities such as corporate bonds,

¹³⁰ Agustín Carstens, *Digital Currencies and the Future of the Monetary System*, Remarks at the Hoover Institution policy seminar (Jan. 27, 2021), available at <https://www.bis.org/speeches/sp210127.htm>.

¹³¹ See John Crawford, Lev Menand & Morgan Ricks, *FedAccounts: Digital Dollars*, 89 GEO. WASH. L. REV. 113 (2021).

¹³² This is not the only argument in favor of FedAccounts. See Part II of Crawford, Menand & Ricks for a full discussion of potential benefits.

¹³³ FDIC, *How America Banks: Household Use of Banking and Financial Services* (Oct. 19, 2020), available at <https://www.fdic.gov/analysis/household-survey/index.html>.

¹³⁴ Financial inclusion is currently not in the Federal Reserve’s mandate. See Board of Governors of the Federal Reserve System, *Statement on Longer-Run Goals and Monetary Policy Strategy* (Jan. 26, 2021), available at https://www.federalreserve.gov/monetarypolicy/files/FOMC_LongerRunGoals.pdf. See also Lars Peter Hansen, *Central Banking Challenges Posed by Uncertain Climate Change and Natural Disasters*, University of Chicago working paper (Jun. 9, 2021), available at <http://larspeterhansen.org/wp-content/uploads/2021/06/CRNYU.pdf> (arguing that “[b]y adhering to their mandated roles, [central banks] retain their critically important distance from the political arena.”); Paul Tucker, *UNELECTED POWER: THE QUEST FOR LEGITIMACY IN CENTRAL BANKING AND THE REGULATORY STATE* (2018).

¹³⁵ See Arvind Krishnamurthy & Annette Vissing-Jorgensen, *The Aggregate Demand for Treasury Debt*, 120 JOURNAL OF POLITICAL ECONOMY 233 (2012).

commercial and residential mortgage-backed securities, and other asset-backed securities.¹³⁶ Of course, it's not the size of the purchases that is an issue; the Federal Reserve could buy a lot more if it wanted. The problem is that this would introduce distortions into the capital markets, as the private sector would over-produce the highest risk securities that the Federal Reserve purchases.¹³⁷ This occurred in the Euro-zone.¹³⁸ As Nyborg put it: "if central bank money is available only against igloos, or igloo-backed securities, igloos will be built."¹³⁹ In short, the Federal Reserve would be engaging in fiscal policy with all the political ramifications that would entail and jeopardizing its independence.

Conclusion

The more things change, the more they stay the same. It is still the case that regulation is being outpaced by innovation—thereby creating an uneven playing field—as it is easier and cheaper for more technologically advanced firms to offer similar products and services.

In this case, it is also true that the problems associated with privately produced money are the same as they were one hundred and fifty years ago. We stress three points from our review of history. First, the use of private bank notes was a failure because they did not satisfy the NQA principle. Second, the U.S. government took control of the monetary system under the National Bank Act and subsequent legislation in order to eliminate the private bank note system in favor of a uniform currency—namely, national bank notes. Third, runs on demand deposits only ended with deposit insurance in 1934.

Currently, it does not appear that stablecoins are used as money. But, as stablecoins evolve further, the stablecoin world will look increasingly like an unregulated version of the Free Banking Era—a world of wildcat banking. During the Free Banking Era, private bank monies circulated at time-varying discounts based on geography and the perceived risk of the issuing bank. Stablecoin prices are independent of geography but not independent of the perceived risk of their backing assets. If they succeed in differentiating themselves from fiat cryptocurrencies and become used as money, then they will likely trade at time-varying

¹³⁶ Currently, the Federal Reserve cannot buy corporate bonds and private-label asset-backed securities during normal times.

¹³⁷ Proponents of FedAccounts recognize this potential problem as well. See Crawford et al., *supra* note 131, at 145 ("Market depth is limited, and the central bank could end up dominating these markets, pushing asset prices around and distorting credit allocation. Optimal portfolio composition therefore cannot be determined a priori. It depends on the available supply of suitable investment assets in relation to the desired base money supply (which is a function of monetary policy).").

¹³⁸ See, e.g., Sjoerd Van Bakkum, Marc Gabarro & Rustom M. Irani, *Does a Larger Menu Increase Appetite? Collateral Eligibility and Bank Risk-Taking*, 31 REVIEW OF FINANCIAL STUDIES 943 (2018).

¹³⁹ Kjell G. Nyborg, COLLATERAL FRAMEWORKS: THE OPEN SECRET OF CENTRAL BANKS (2016). See also Stefano Pegoraro & Mattia Montagna, *Issuance and Valuation of Corporate Bonds with Quantitative Easing*, ECB WORKING PAPER SERIES NO. 2520 (Jan. 2021), available at <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2520~9bb4771fac.en.pdf>; Roberto A. De Santis & Andrea Zaghini, *Unconventional Monetary Policy and Corporate Bond Issuance*, ECB WORKING PAPER SERIES NO. 2329 (Nov. 2019), available at <https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2329~62f5d264a5.en.pdf>; Karamfil Todorov, *Quantify the Quantitative Easing: Impact on Bonds and Corporate Debt Issuance*, 135 JOURNAL OF FINANCIAL ECONOMICS 340 (2020).

discounts as well. Policymakers have a couple of ways to address this development, and they better get going.

Appendix

Sources for Tables 2 and 3

Name	Sources
Tether	<p>What is the coin pegged to? USD: https://tether.to/, under “100% backed”</p> <p>Market Cap: https://coinmarketcap.com/currencies/tether/</p> <p>Is the contract equity or debt? Equity: https://tether.to/legal/, section 3</p> <p>How to redeem it? Redemption process: https://tether.to/redeem-tethers-to-bank-account/</p> <p>Tether available to redeem in US, except New York, as per its settlement with the NY Attorney General: https://ag.ny.gov/sites/default/files/2021.02.17 - settlement agreement - execution version.b-t signed-c2_oag signed.pdf, p.11, section 57c</p> <p>Is there a cost to redeem? Yes: https://tether.to/fees/</p> <p>Is there a notice period? No, but verification process can delay redemption. Accounts must be verified before redeeming can occur: https://tether.to/redeem-tethers-to-bank-account/</p> <p>Verification process: https://tether.to/verify-tether-account/</p> <p>How are the underlying assets custodied? Tether banks with Deltec Bank & Trust: https://www.nasdaq.com/articles/tether-confirms-that-it-is-banking-with-bahamas-based-deltec-2018-11-01</p> <p>Tether still partners with Deltec as of 2021: https://www.coindesk.com/tether-bank-deltec-stablecoin-reserves</p>
USDC	<p>What is the coin pegged to? USD: https://www.centre.io/usdc-faq, under “What is USDC and why is it important and needed?”</p> <p>Market Cap: https://coinmarketcap.com/currencies/usd-coin/</p>

Is the contract equity or debt?

Debt:

<https://support.usdc.circle.com/hc/en-us/articles/360001233386>, section 2

How to redeem it?

Redemption process:

<https://www.centre.io/usdc-faq>, under “How does USDC work technically?”

<https://f.hubspotusercontent30.net/hubfs/9304636/PDF/centre-whitepaper.pdf>, p.10-11

Minimum redemption amount:

<https://support.usdc.circle.com/hc/en-us/articles/360015269732-Redeeming-USDC-FAQ>, under “Are there any minimum redemption amounts for USDC?”

Is there a cost to redeem?

No:

<https://support.usdc.circle.com/hc/en-us/articles/360015269732-Redeeming-USDC-FAQ>, under “Are there any fees for redeeming USDC?”

Is there a notice period?

No, but there is a verification process for each redemption:

<https://www.centre.io/usdc-faq>, under “How does USDC work technically?”

How are the underlying assets custodied?

Licensed CENTRE token-issuing member:

<https://f.hubspotusercontent30.net/hubfs/9304636/PDF/centre-whitepaper.pdf>

TrueUSD

What is the coin pegged to?

USD:

<https://cryptonews.com/coins/trueusd/>

Market Cap:

<https://coinmarketcap.com/currencies/trueusd/>

Is the contract equity or debt?

Debt:

<https://www.trusttoken.com/terms-of-use>, under “TrueCoin Services”

How to redeem it?

Redemption process:

<https://support.trusttoken.com/hc/en-us/articles/360024952672-How-do-I-mint-and-redeem-TrueUSD-and-other-TrueCurrencies->

Is there a cost to redeem?

No:

<https://support.trusttoken.com/hc/en-us/articles/360019876351-What-are-the-fees-for-mints-and-redemptions->

Is there a notice period?

No:

<https://support.trusttoken.com/hc/en-us/articles/360024952672-How-do-I-mint-and-redeem-TrueUSD-and-other-TrueCurrencies->

How are the underlying assets custodied?

Escrow accounts:

<https://blog.truistoken.com/who-are-the-correspondent-banks-and-trustee-partners-for-trueusd-e12508f0d5a2>

Paxos

What is the coin pegged to?

USD:

<https://www.paxos.com/paxos-launches-new-stablecoin-paxos-standard-pax/>

Market Cap:

<https://coinmarketcap.com/currencies/paxos-standard/>

Is the contract equity or debt?

Debt:

<https://www.paxos.com/paxos-standard-terms-conditions/>, section 4.1, section 9

How to redeem it?

Redemption process:

<https://cryptonews.com/coins/paxos-standard-token/>, under “How Does Paxos Standard Token Work?”

<https://www.paxos.com/paxos-standard-terms-conditions/>, section 9

Is there a cost to redeem?

No:

<https://www.paxos.com/paxos-standard-terms-conditions/>, section 13

Is there a notice period?

No, immediate redemption:

<https://www.paxos.com/the-new-paxos-platform-move-from-pax-to-dollars-instantly/>

How are the underlying assets custodied?

Paxos Trust Company:

<https://www.paxos.com/paxos-standard-terms-conditions/>, section 4

Gemini Dollar

What is the coin pegged to?

USD:

<https://www.gemini.com/dollar>

Market Cap:

<https://coinmarketcap.com/currencies/gemini-dollar/>

Is the contract equity or debt?

Debt:

<https://www.gemini.com/legal/user-agreement#section-redemption>, under “Redemption”

How to redeem it?

Redemption process:

<https://support.gemini.com/hc/en-us/articles/360001352466-How-do-I-buy-or-sell-my-Gemini-dollar-GUSD->

Is there a cost to redeem?

No:

<https://support.gemini.com/hc/en-us/articles/360001352466-How-do-I-buy-or-sell-my-Gemini-dollar-GUSD->

Is there a notice period?

No:

<https://support.gemini.com/hc/en-us/articles/360001352466-How-do-I-buy-or-sell-my-Gemini-dollar-GUSD->

How are the underlying assets custodied?

State Street Bank and Trust Company:

<https://www.coindesk.com/crypto/gemini-dollar>

US banks eligible for FDIC “pass through” insurance:

<https://www.gemini.com/blog/gemini-launches-the-gemini-dollar-us-dollars-on-the-blockchain>

EURSToken

What is the coin pegged to?

Euro:

<https://eurs.stasis.net/>, under “What is EURS?”

Table 2 Footnote / Table 3 How to redeem it?

EURS not directly redeemable through STASIS, but it is redeemable through other institutions and digital asset exchanges:

<https://eurs.stasis.net/qa/>, under “About EURS” / “Can I exchange EURS for fiat euros?”

Some of the institutions/exchanges listed in the above source no longer operate: ePayments was suspended:

<https://cointelegraph.com/news/suspended-epayments-platform-will-relaunch-without-crypto>

DSX no longer works:

<https://dsxglobal.com/>

Gozo no longer works:

<https://gozo.pro/>

Market Cap:

<https://coinmarketcap.com/currencies/stasis-euro/>

Is the contract equity or debt?

Equity:

<https://stasis.net/blog/>, under “There Are a Lot of Stable Coin Projects—Here’s How Ours is Different” / “How does EURs fit into all this?”

How are the underlying assets custodied?

Partner institutions:

<https://eurs.stasis.net/qa/>, under “About STASIS” / “Who manages the reserves and how?”

Names of partner institutions are listed in the “On-demand verification” document:

<https://stasis.net/transparency/>

**Stably USD,
formerly
StableUSD
(USDS)**

What is the coin pegged to?

USD:

<https://www.stably.io/stablecoins/>

Market Cap:

<https://coinmarketcap.com/currencies/stableusd/>

Is the contract equity or debt?

Debt:

<https://www.stably.io/terms-of-service/>, section 2.1

How to redeem it?

<https://medium.com/stably-blog/stableusd-usds-is-the-newest-stablecoin-to-join-binances-stablecoin-market-24c69bc4a897>, under “How to Redeem USDS”

Is there a cost to redeem?

No:

<https://medium.com/stably-blog/stableusd-usds-is-the-newest-stablecoin-to-join-binances-stablecoin-market-24c69bc4a897>, under “Fees”

Is there a notice period?

No:

<https://www.stably.io/stablecoins/>, under “Our Stablecoin’s Features”

How are the underlying assets custodied?

Prime Trust:

<https://www.stably.io/stablecoins/>

**Stronghold
USD**

What is the coin pegged to?

USD:

<https://stronghold.co/stronghold-usd>, under “FAQ” / “Why Stronghold USD?”

Market Cap:

Unknown market cap:

<https://coinmarketcap.com/currencies/stronghold-usd/>

Inactive for retail investors:

<https://cryptobriefing.com/stronghold-just-another-stablecoin/>

Is the contract equity or debt?

Debt:

<https://stronghold.co/terms-of-service>, section 4.3, section 5

[https://media-](https://media-nucleo.s3.amazonaws.com/media/asset/73/whitepaper/RBFACISPBC9S.pdf)

[nucleo.s3.amazonaws.com/media/asset/73/whitepaper/RBFACISPBC9S.pdf](https://media-nucleo.s3.amazonaws.com/media/asset/73/whitepaper/RBFACISPBC9S.pdf), p.2,
p.7

How to redeem it?

Redemption process:

<https://media-nucleo.s3.amazonaws.com/media/asset/73/whitepaper/RBFACISPBC9S.pdf>, p.7

Is there a cost to redeem?

No:
<https://stronghold.co/legal>, section 5

Is there a notice period?

No:
<https://media-nucleo.s3.amazonaws.com/media/asset/73/whitepaper/RBFACISPBC9S.pdf>, p.7

How are the underlying assets custodied?

Prime Trust:
<https://news.bitcoin.com/ibm-backs-the-development-of-latest-new-stablecoin-stronghold-usd/>

Prime Trust deposits the cash at FDIC-insured banks:
<https://www.coindesk.com/ibm-is-helping-launch-a-price-stable-cryptocurrency-insured-by-the-fdic>

Facebook's Diem (formerly Libra)

What is the coin pegged to?

Single currency and multiple currencies:
<https://www.diem.com/en-us/white-paper/#cover-letter>, under “Offering single-currency stablecoins in addition to the multi-currency coin”

Market Cap:

N/A. Diem not yet released:
<https://coingeek.com/facebook-diem-announces-us-stablecoin-launch/>

Is the contract equity or debt?

Debt:
<https://www.diem.com/en-us/white-paper/#the-economic-and-the-libra-reserve>, under “Emergency Operations”

How to redeem it?

Designated Dealers:
<https://www.diem.com/en-us/white-paper/#compliance-and-the-prevention-of-illicit-activity>, under “Details of compliance and safety controls across the Libra network” / “D. Association will distribute Libra Coins through regulated Designated Dealers”

Is there a cost to redeem?

Unclear, may have redemption fees:
<https://www.diem.com/en-us/white-paper/#the-economic-and-the-libra-reserve>, under “Emergency Operations”

May also have transaction fees:
<https://www.diem.com/en-us/white-paper/#the-economic-and-the-libra-reserve>, under “The importance of full backing and risk mitigation”

Is there a notice period?

Unclear, may have redemption stays:

<https://www.diem.com/en-us/white-paper/#the-economic-and-the-libra-reserve>,
under “Emergency Operations”

How are the underlying assets custodied?

Reserve:

<https://www.diem.com/en-us/white-paper/#the-economic-and-the-libra-reserve>,
under “Custody and Designated Dealers”
