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Coin Taxes

Luís C. Calderón Gómez and Mitchell A. Kane*

New kinds of private money are thriving, with increasing circulation, growing acceptance, and rapid technological innovation. But this new money suffers from an old problem: bank runs. Bank runs can destabilize even well-regulated and healthy banks, and their contagion can catalyze and amplify a system-wide financial crisis. Since the 1930s, policymakers have sought to protect our financial system from bank runs through public deposit insurance and other emergency response mechanisms. Those historically effective policy tools, however, are critically unavailable or ineffective in the context of these new types of money. As a result, these new types of money remain critically vulnerable to bank runs, and the potential for financial contagion from their failure poses catastrophic risks to society.

In light of traditional legal tools' inadequacy, this Article proposes an unconventional solution to the financial contagion risks these new kinds of money impose on society writ large: taxation. A corrective or Pigouvian tax—unlike traditional banking regulation or traditional response mechanisms—can effectively reduce the risk of financial contagion by forcing private money issuers to internalize the social costs of contagion in their private decision-making. In this Article, we make the case for such a tax, discuss its main design features, and explain how tax instruments can partly replicate the success of public deposit insurance. Further, we explain why tax instruments can be superior to traditional tools at addressing the risk of financial contagion from new money, challenging banking-law-centered policymaking. In doing so, we show that more than a second-best solution, Coin Taxes exemplify a set of efficient and adaptable alternative tools that policymakers could use to regulate new, innovative, or regulation-avoidant banking—from stablecoins to shadow banking.

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INTRODUCTION

Imagine a new form of money that is faster and cheaper to use, both within and across national borders. This new money is impervious to the whims of central bankers (and the mercurial politicians who appoint them). Moreover, this new money is not subject to the costly fees imposed by traditional financial intermediaries, significantly reducing the cost of everything from creating an account to moving money across borders.

But there is a catch. This "new money" is not created (or "issued" in banking parlance) by the Treasury Department but is rather issued, and largely self-regulated, by private for-profit actors. Given its position outside of the traditional banking law

regulatory sphere, new money could drastically increase financial stability risks throughout the world because of its vulnerability to bank runs capable of catalyzing and amplifying a broader financial crisis. Moreover, their light governmental supervision makes these new types of money ideal candidates to finance terrorism and avoid governmental sanctions.[1] Furthermore, these new types of money, if widely adopted, could fundamentally transform economic policymaking by effectively depriving the sovereign of its traditional monopoly over monetary policy.

This new money is not the stuff of science fiction. A relatively novel, but much talked about, digital asset—stablecoin—shows that there is an appetite for such instruments and that they already pose real threats to the economy.[2] Stablecoins are a type of digital currency whose value is pegged to some other asset (e.g., one stablecoin = one U.S. dollar or one Euro), therefore ensuring that its price is "stable"—unlike the prices of other cryptocurrencies such as Bitcoin or Ethereum. Stablecoins generally achieve this peg by committing to holding safe assets (such as gold or U.S. Treasury bonds) that can back the peg.[3] The market for stablecoins is large—and growing. The leading coin by market capitalization is Tether (also known as USDT), boasting a market capitalization of $180 billion.[4] Stablecoin issuers are incorporated in lightly regulated jurisdictions[5] and have, until recently, largely escaped regulation.[6] Tether makes money through user fees on money creation and,

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1. *See, e.g.*, *Update from the U.S. Treasury Department – Countering Illicit Finance, Counter-Terrorism, and Sanctions Evasion: Hearing Before S. Banking, Hous. & Urb. Aff. Comm.*, 118th Cong. (2024), https://www.banking.senate.gov/imo/media/doc/adeyemo_testimony_4-9-243.pdf [perma.cc/P2R8-U8J7] (statement of Adewale O. Adeyemo, Deputy Sec'y Treasury).

2. *See* BD. GOVERNORS FED. RSRV. SYS., FINANCIAL STABILITY REPORT 43 (2025), https://www.federalreserve.gov/publications/files/financial-stability-report-20250425.pdf [perma.cc/P56M-5D8A].

3. *See, e.g.*, *Transparency*, TETHER (Mar. 31, 2024), https://tether.to/en/transparency/?tab=reports [perma.cc/2ZSD-AUK4] (self-reporting Tether's collateral to maintain the peg, including eighty percent of reserves invested in "cash and cash equivalents" and five percent invested in Bitcoin).

4. *See Tether*, COINBASE, https://www.coinbase.com/price/tether [perma.cc/4FLL-ABXJ] (calculating a market cap size of $183 billion on September 7, 2026).

5. For example, Tether is incorporated in El Salvador, after moving from the Virgin Islands. *See, e.g.*, *Legal*, TETHER (Jan. 27, 2025), https://tether.to/en/legal [perma.cc/K5MM-DRSZ]. Strategic incorporation is a broad phenomenon across the crypto industry. *Cf.* Omri Marian, *Blockchain Havens and the Need for Their Internationally-Coordinated Regulation*, 23 FLA. TAX REV. 770, 777–81 (2020).

6. The European Union (EU) has taken the global regulatory lead with the regulation of stablecoins, through its Markets in Crypto-Assets Regulation (also known as MiCAR), part of which became applicable to stablecoins in June 2024. *See* Council Regulation 2023/1114, 2023 O.J. (L 150) 40, 40 [hereinafter MiCAR].

MiCAR seeks to comprehensively regulate the issuance, operation, and sale of stablecoins. *See, e.g.*, MiCAR, arts. 22, 23, 36, 38, 39, 47. MiCAR also categorizes large stablecoins as "significant," subjecting them to supervision by the European Banking Authority and to stricter regulatory requirements. *See* MiCAR, arts. 43, 45. Recent regulations seem to establish a forty percent cash reserve requirement for significant tokens. *See* CLIFFORD CHANCE, WHAT DOES MICAR MEAN FOR ISSUING AND OFFERING STABLECOINS AND OTHER CRYPTO-ASSETS IN THE EU? 8–9 (2024), https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2024/07/what-does-micar-mean-for-issuing-stablecoins-and-crypto-assets-in-the-eu.pdf [perma.cc/49ZD-4EJA].

Despite MiCAR's comprehensiveness, the regulation is unlikely to succeed in generating a well-regulated and safe, but dynamic, environment. Only one of the top ten largest stablecoins (by market capitalization) is compliant with MiCAR. *See Circle Is First Global Stablecoin Issuer to Comply with MiCA, EU's Landmark Crypto Law*, CIRCLE (July 1, 2024), https://www.circle.com/en/pressroom/circle-is-

similar to traditional banks, through interest on its reserves.

But what *exactly* are stablecoins? Despite their novelty, stablecoins possess some crucial attributes that make them just "like bank deposits," a paradigm of old money.[7] Consider three. First, a bank depositor typically transfers fiat currency (e.g., U.S. dollars) to the bank and receives some type of deposit receipt as evidence of the transfer in the moment and can verify the deposit at later points in time by making balance inquiries with respect to a dedicated account number. Likewise, the purchaser of a stablecoin (from a creator or "issuer," as opposed to a secondary-market seller) will typically transfer fiat currency to the issuer and receive evidence of such purchase in the form of a stablecoin token (e.g., USDT). Second, for demand deposits, the depositor has the right to withdraw account balance at any time in fiat currency. Likewise, the issuer of a redeemable stablecoin stands ready to redeem tokens at par for fiat currency. That is, a USDT holder can ask Tether to

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first-global-stablecoin-issuer-to-comply-with-mica-eus-landmark-crypto-law [perma.cc/7423-T6L7].

Tether, the largest stablecoin issuer (boasting a market share of around eighty percent) exited the EU market, dealing a blow to the European crypto system. *See* Alejandro Gonzalez Rossi, *The End (For Now) of Tether in Europe: Assessing the Impact of the Markets in Crypto-Assets Regulation*, COMPAR. DIGIT. L. BLOG (Feb. 19. 2025), https://lawandtech.ie/the-end-for-now-of-tether-in-europe-assessing-the-impact-of-the-markets-in-crypto-assets-regulation [perma.cc/NZ5X-78GG].

Even if Tether and other coins are delisted, it is unlikely that stablecoin issuers will change their behavior and consumers will likely purchase stablecoin through VPNs. *See infra* notes 164–170. Furthermore, MiCAR has gaping holes that issuers have already been willing to exploit. *See* Philip Stafford, *EU Prepares for Crypto Leap of Faith,* FIN. TIMES (June 28, 2024), https://www.ft.com/content/46bd8a05-78d5-43b6-a87b-e92b47d2eb26? [perma.cc/U928-4ATB] (describing issuers arguing they are "decentralized" or that they are backed by "non-fungible" tokens themselves based on gold, ensuring they remain outside of MiCAR's perimeter).

Moreover, if a giant like Amazon were to issue a coin, see *infra* Section I.A., but would structure its coin without an explicit reserve or "peg" to the dollar, it arguably would not be subject to MiCAR's prohibitions on size, because it would not be either an asset-referenced token or an e-money token. *See* Article 23; Mattias Lehmann, Presentation at the EBI Global Annual Conference, Dreaming about MiCAR, at slide 12 (2024), *available at* https://ebi-europa.eu/wp-content/uploads/2024/03/Slides-EBI-GAC-2024-Panel-3-Matthias-Lehmann.pdf [perma.cc/7U6D-Q7PG].

Perhaps more worrisomely, it is unclear whether the EU's heavy-handed regulatory approach will actually reduce systemic risk, as its onerous cash reserve requirements, for example, are likely to send stablecoin issuers into a search for yield and increase the riskiness of their portfolio. This, without indeed making these "banks" impervious to runs. *See infra* notes 72–74. Most importantly, even if MiCAR were to succeed in effectively regulating stablecoins and preventing insolvency-based runs, as previewed by the Diamond-Dybvig model, this would not make stablecoin issuers impervious to runs; other coordination mechanisms, such as deposit insurance, are needed to halt runs. *See infra* I.B.

The United States recently joined the EU in regulating stablecoins. The U.S. regulatory approach is much more permissive, and it critically fails to address stablecoins' financial stability risks. *See infra* note 19.

7. This is well-understood. In a hearing before the U.S. Senate Committee on Banking, Housing, and Urban Affairs, Jerome Powell, Chairman of the Federal Reserve, succinctly explained that "[t]hey are like money funds, they are like bank deposits, and they are growing incredibly fast but without appropriate regulation." *See* Joe Light and Jesse Hamilton, *Yellen to Convene U.S. Regulators to Discuss Stablecoins*, BLOOMBERG (July 16, 2021), https://www.bloomberg.com/news/articles/2021-07-16/yellen-to-convene-u-s-regulators-to-discuss-stablecoin-rules [perma.cc/S67K-8TVA] (quoting Jerome Powell); Gary B. Gorton & Jeffrey Zhang, *Taming Wildcat Stablecoins*, 90 U. CHI. L. REV. 909, 915–35 (2023); Luís C. Calderón Gómez, *Stopping Runs in the Digital Era*, 25 U. PA. J. BUS. L. 615, 606–14 (2023); Dan Awrey, *Bad Money*, 106 CORNELL L. REV. 1, 45 (2020); David Schwarcz, *Regulating Digital Currencies: Towards an Analytical Framework*, 102 B.U. L. REV. 1037, 1063 (2020).

redeem her tokens one-to-one to U.S. dollars.[8] Third, banks offer depositors payment services (paying at point of sale via debit card or personal check). Likewise, collateralized stablecoin can be used as a payment mechanism via peer-to-peer transfer of the cryptocurrency or via a centralized exchange.

Critically, new money's issuers share another essential quality with traditional banks: their vulnerability to bank runs. The run dynamics are quite simple. Rather than keep all deposits in cash, traditional banks and new money issuers, such as Tether, invest part of their deposits to make a profit, investing in assets from Treasury bills to corporate debt but also in illiquid and long-term loans.[9] As a result, if a critical mass of depositors seeks to withdraw their deposits in a short period of time (e.g., because they have lost confidence in the bank, because of a general market panic, or because they fear withdrawing too late and risking their deposit), banks face pressure to use all their liquid reserves and might have to sell their illiquid or long-term investments at "fire sale" prices. Foreseeing the bank's deteriorating financial position and fearing the bank's failure, more depositors run on the bank, causing further financial distress (and incentivizing more depositors to run). Historically, this feedback loop ends with the bank's failure and with some depositors (the slowest ones to withdraw) losing their money.[10] A critical point is worth highlighting here: depositors' expectations are self-fulfilling in this context, even a healthy bank will succumb to enough withdrawals. As will be discussed later, the economic damage of such a failure is often not contained to the bank's depositors, but instead catalyzes or amplifies broader financial contagion, affecting other banks and potentially the entire economy.[11] Bank runs are thus considered an unavoidable Achilles' heel of our banking system[12] and a "perennial" vulnerability[13] of traditional banks—afflicting even well-regulated and healthy banks.[14]

But we are not defenseless against bank runs. In the United States, traditional banks' vulnerabilities to bank runs have been effectively managed, and traditional bank runs are mostly a thing of yore.[15] Banking regulation and supervision has been

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8. Depositors' ability to redeem might be formally limited. For example, Tether requires a minimum of $100,000 for redemption requests. *Crystal Clear Fees*, TETHER (2025), https://tether.to/es/fees/ [perma.cc/ZY5D-SBDD]. Although the minimum might preclude small redemptions, being able to exchange the coins in exchanges *plus* the ability of large holders of the coin to legally redeem their coins for the peg amount (i.e., one USDT = one USD) ensures the practical redeemability of USDT—setting aside times of crisis.

9. For example, about twenty percent of Tether's assets are reportedly held in non-cash equivalents. *See* TETHER, TETHER: FINANCIAL FIGURES AND REPORT 4 (June 30, 2025), https://assets.ctfassets.net/vyse88cgwfbl/2SGAAXnsb1wKByIzkhcbSx/9efa4682b3cd4c62d87a4c88ee729693/ISAE_3000R__Opinion_Tether_International_Financial_Figure_RC187322025BD0201.pdf [perma.cc/W8AZ-VNDU].

10. *See infra* Section I.B.

11. *See infra* Section I.C.

12. *See* CARMEN M. REINHART & KENNETH S. ROGOFF, THIS TIME IS DIFFERENT: EIGHT CENTURIES OF FINANCIAL FOLLY 147–53, 203–06 (2009).

13. ROBERT Z. ALIBER & CHARLES P. KINDLEBERGER, MANIAS, PANICS AND CRASHES vii, 20 (7th ed. 2015).

14. *See infra* Section I.B.

15. At least in the United States. *But see infra* note 75 (discussing the 2023 bank runs).

insufficient to deter runs.[16] Rather, the United States has accomplished that feat primarily through the implementation of an effective scheme of public insurance of bank deposits (i.e., through the Federal Deposit Insurance Corporation, or FDIC),[17] and through other emergency response mechanisms that deter and halt runs.[18] Public deposit insurance is effective at stopping runs because it eliminates bank depositors' incentives to run; even if their bank fails, depositors need not panic about losing their deposits, because the government is insuring those deposits and will pay them in full.

The problem is, however, that while old money and new money are both vulnerable to runs, our effective prevention scheme—with public deposit insurance at its center—is generally only able to protect traditional banks from runs. Despite significant attention from policymakers and legal scholars,[19] and the implementation of lauded new "landmark" regulatory frameworks for certain kinds of new money,[20] new money instruments such as stablecoins remain for the

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16. *See infra* Section I.B.

17. *See infra* Section I.D.1.

18. *See infra* Section I.D.2–4.

19. *See supra* note 2. Scholars have loudly warned of stablecoins' vulnerability to runs. *See, e.g.*, Gorton & Zhang, *supra* note 7, at 915–35; Calderón Gómez, *supra* note 7, at 606–14; Awrey, *supra* note 7, at 45.

19. See Gorton & Zhang, *supra* note 7, at 920–29 (discussing how stablecoins are not "deposits"). *See also* Awrey, *supra* note 7, at 43–55 (2020) (discussing the inadequacy of the regulatory framework for money services businesses).

20. President Trump signed the Guiding and Establishing National Innovation for U.S. Stablecoins Act (GENIUS Act) on July 18, 2025. GENIUS Act, Pub. L. No. 91-508, 131 Stat. 934 (2025) [hereinafter GENIUS Act]. The GENIUS Act was aimed to "bring [stablecoins] into the mainstream" by "provid[ing] a clear regulatory framework for stablecoins" to "mak[e] the United States the crypto capital of the world". 171 Cong. Rec. S3327 (daily ed. June 11, 2025) (statement of Sen. Thune).

The GENIUS Act aims to bring stablecoins within the regular banking parameter and normalize the issuance of stablecoin. First, it generally restricts the issuance of stablecoins to compliant issuers. *See* GENIUS Act § 3. The Act requires issuers to have at least one-to-one reserves with respect to issued coins and provides that the reserves must comprise certain kinds of assets (e.g., Treasury bills). GENIUS Act § 4(a)(1)(A). The issuer must also publicly disclose its coin redemption policy, but the Act would bar issuers from including any discretionary limitations on timely redemptions. GENIUS Act § 4(a)(1)(B). The Act provides that stablecoin issuers are subject to general Bank Secrecy Act requirements, therefore imposing sanctions, money laundering and similar requirements on issuance of coins. *See* GENIUS Act § 5. Importantly, the Act prohibits the payment of interest on coins. GENIUS Act § 11. The Act also directs the relevant agencies to engage in supervision of stablecoin issuers, assessing both the soundness of the issuer and the potential effects that the failure of the issuer could have for the financial system. *See* GENIUS Act § 6(a).

The bill's critics have pointed out that the GENIUS Act has several significant problems. *See* 171 Cong. Rec. S3400–01 (daily ed. June 16, 2025) (statement of Sen. Reed). Several of Senator Reed's criticisms are relevant to this Article. First, the prudential regulatory regime is too light, allowing stablecoin issuers to operate with minimal capital requirements, leaving them without a sufficient capital cushion with which to respond to a run: one-to-one reserve requirements are not enough to ensure solvency in times of crises when there are fire sales. *See* GENIUS Act §§ 4(a)(4)(A), (4)(C). Second, the Act does not ensure that issuers' financial information is independently audited, increasing the odds that bad market signals generate a panic that issuers cannot credibly halt. *See* GENIUS Act §§ 4(a)(3), 10. Lastly, the Act does not provide for quick resolution mechanisms such as those executed by the FDIC, possibly making financial contagion harder (and slower) to control. GENIUS Act §§ 11.

But, most importantly, the Act does not require stablecoin issuers to be covered under a federal deposit insurance regime—in fact, the Act clarifies that they are not insured and cannot represent that

moment relatively unregulated and unsupervised, and—more importantly—effectively uninsured and uncovered by other bank run response mechanisms.[21] This vacuum has prompted legal scholars and regulators to warn of runs on stablecoins, and on similar financial instruments, and of the potential for broader contagion to the financial system, capable of triggering a crisis.[22] In fact, the most recent Financial Stability Oversight Council reports recognized stablecoin for this precise threat, identifying stablecoin as a key threat to the financial system because of its vulnerability to bank runs and its potential to catalyze a system-wide financial crisis, ranking it alongside other much more discussed threats such as the growth in private credit and shadow banking.[23]

Regulators' concern is not just that a run might destabilize one stablecoin issuer, but rather that, because these assets do not exist in a vacuum, the issuer's failure could unleash a catastrophic contagion across the financial system.[24] A stablecoin issuer's potential failure thus poses costs not only to coin holders, it also poses external risks to third parties who might be harmed by the financial contagion unleashed by its failure, from holders of other digital assets to traditional regulated banks and traditional bank customers who otherwise have no appetite for the risky asset *du jour*. In other words, Tether's failure would not just hurt "crypto bros"; its failure would also hurt mom and pop. We have seen such contagion dynamics play out before: Consider the "isolated" mortgage-backed securities or the triparty repo market and the way they catalyzed and amplified the—global—2008 financial crisis.[25]

Given that the hurdles to effectively regulating the risks of stablecoin (and other kinds of new money) are high as a practical matter, several legal scholars have instead argued for the displacement of these new kinds of money with alternate instruments—either central bank digital currency (CBDC) or tokenized bank deposits.[26] CBDC and

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they are insured. *See* GENIUS Act § 4(e). This leaves stablecoin issuers vulnerable to runs, as even well-regulated banks fail without deposit insurance. This did not escape opponents of the bill in the Senate, who warned that the bill's "fold[ing in] stablecoins into the traditional financial system, while applying weaker safeguards than banks or investment companies must adhere to" could cause "a massive financial crash facilitated by the stablecoin market." *See* 171 Cong. Rec. S2963 (daily ed. May 19, 2025) (statement of Sen. Warren).

The Genius Act is also not flexible. As Sen. Reed noted, its provisions are not easily modifiable. Moreover, it does not preview the evolution of the law, by not barring non-financial services companies from issuing stablecoins—such as Amazon—but rather requiring them to obtain regulatory permission. *See* Genius Act § 12(B)(i).

21. *See infra* Section I.A, Part II. *But see supra* notes 6 and 19 (discussing EU and U.S. regulatory frameworks).

22. *See infra* note 34.

23. *See supra* note 2; FINANCIAL STABILITY OVERSIGHT COUNCIL, ANNUAL REPORT 9 (2024) https://home.treasury.gov/system/files/261/FSOC2024AnnualReport.pdf [perma.cc/4NAQ-ELLP].

24. *See infra* Section I.C.

25. *See, e.g.*, Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 J. FIN. ECON. 425, 446–48 (2012); Fabio Panetta, Executive Board Member, Eur. Cent. Bank, For a Few Cryptos More: The Wild West of Crypto Finance, Speech at Columbia University (Apr. 25, 2022), https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp220425-6436006db0.en.html ("[T]he crypto market is now larger than the sub-prime mortgage market was when . . . it triggered the global financial crisis. And it shows strikingly similar dynamics.").

26. *See* Gorton and Zhang, *supra* note 7, at 956–64 (advocating that CBDC ought to displace

tokenized deposits may indeed come to displace stablecoins in part or in whole. But, for three reasons we believe it would be shortsighted to assume this will be the case.

Most prominent of all is that it might be too late already. The current administration's general pro-crypto stance has crystallized itself in a prohibition against the development of CBDCs that could compete with these new kinds of money, effectively ruling them out as a competitor to displace new money instruments such as stablecoins.[27] Perhaps even more importantly, recent legislation, such as the GENIUS Act, might have done enough to "legitimize" stablecoins by partially bringing them into the regulatory framework.[28] As a result, even if a competitor like CBDC were developed, it would be very difficult for it to displace types of new money (e.g., stablecoin) once they have become entrenched and legitimized (to a degree) in the legal system.

Secondly, even if there were the political will to do so, it may be practically difficult to regulate stablecoins out of existence.[29] For now, most stablecoins are collateralized with U.S. dollars or other short-term U.S. dollar denominated paper. So long as this is the case, it may be possible for the United States to exert substantial regulatory leverage—for example, by denying banks that hold stablecoin collateral the ability to have an account with the Federal Reserve (Fed).[30] But collateralization with U.S. dollars is a contingent feature. There is nothing to prevent issuers of stablecoins from collateralizing with a different fiat currency in a jurisdiction that does not seek to regulate the stablecoins out of existence (or from collateralizing with gold, for example).[31] Furthermore, if the stablecoin were collateralized with fiat currency that maintains a one-to-one U.S. dollar peg, then the coin could even be denominated in U.S. dollars, even though the holding of collateral would require

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privately issued stablecoin); Todd Phillips, *Tokenized Deposits: How I Learned to Stop Worrying and Love Stablecoins*, 42 REV. BANKING & FIN. L. (2023) (advocating for tokenized deposits to displace privately issued stablecoin).

27. *See* Exec. Order No. 14178, Strengthening American Leadership in Digital Financial Technology, 90 Fed. Reg. 8647 §§ 1(a)(v), 5 (Jan. 23, 2025), https://www.whitehouse.gov/presidential-actions/2025/01/strengthening-american-leadership-in-digital-financial-technology/ [perma.cc/D2LS-FBPR].

28. *See supra* note 19 (discussing the GENIUS Act).

29. *See infra* notes 158–163 (discussing the difficulty of banning them and referencing China's failed ban).

30. From 2013 to 2017, the U.S. Department of Justice conducted an anti-fraud initiative known as Operation Choke Point, in which it investigated the banks of businesses considered to be at high risk of conducting fraudulent activities. The aim of the investigations and subsequent lawsuits was two-fold: to enforce consumer protection law against the worst offenders' banks and—more importantly—to signal to other banks that their relationships with businesses engaged in fraudulent activities carried the risk of future lawsuits. The investigations resulted in numerous banks ending their relationships with these businesses, making it more difficult for these businesses to access the banking system. *See* Edward J. Balleisen & Melissa B. Jacoby, *Consumer Protection after the Global Financial Crisis*, 107 GEO. L.J. 813, 835–40 (2023). "Operation Choke Point 2.0" is a term used by some commentators to allege that a similar initiative is underway against the banks of cryptocurrency businesses to keep said crypto-businesses outside the banking system. *See* Jen Wieczner, *Is the Federal Government Trying to Kill Off Crypto?*, N.Y. MAG. (May 1, 2023), https://nymag.com/intelligencer/2023/05/is-the-federal-government-trying-to-kill-off-crypto.html [perma.cc/355B-XEAK].

31. *See e.g. EURC*, COINBASE, https://www.coinbase.com/price/euro-coin-2 [perma.cc/U294-73UC] (describing a stablecoin backed by Euros); *Tether Gold*, COINBASE, https://www.coinbase.com/price/tether-gold [perma.cc/HPM5-GW3H] (describing a stablecoin backed by gold).

no direct connection with the U.S. banking system or the Fed. It thus seems likely that if stablecoins are going to be forced out of existence, then this will have to occur in part through competitive pressures rather than regulatory ones.

This brings us to a third point. Stablecoins, and similar instruments, are likely to be perceived indefinitely by at least some market actors as superior to CBDC or tokenized deposits. We base that observation on the longstanding hostility to centralized, governmental action that has been a core part of the ethos of crypto since its origin.[32] Moreover, stablecoin issuers have been able to innovate in some ways that benefit consumers (e.g., by lowering transaction costs for cross-border payments),[33] and they may continue to outcompete traditionally slow actors like the government and large regulated banks. Even if stablecoins fell out of vogue, it is unlikely that future instruments would as well. As we discuss later, a tech giant like Amazon, seeking to save on transaction fees or to incentivize customer demand and loyalty, could quite quickly and easily create a coin with hundreds of billions of dollars of circulation.

If we are correct that stablecoins cannot be regulated or outcompeted into extinction—even if the political will for such a move existed—then we should plan for a financial regulatory environment in which stablecoins, and other types of new money, continue to exist and may become systemically relevant at some point. To be clear, we make no normative claim here that the continued existence of stablecoins is desirable; we make only the prediction that there is substantial likelihood that these types of new money will continue to exist and that we should devise a sound regulatory environment to address this likelihood. The EU and the United States have already sought to begin erecting a regulatory framework seeking to fold in stablecoin into the traditional banking system.[34] But, importantly, these new regulatory frameworks have not directly addressed the risk that these new types of money pose to the financial system.[35] Given the likelihood of their continued existence, what should we do about these new forms of money's vulnerability to runs—and the contagion risk they pose to our financial system?

Our basic thesis in this Article is that, although public insurance and backup response mechanisms have been the battle-tested strategy in the United States since 1933 to address the harms caused by financial contagion with respect to bank deposits, we believe the preferred strategy for addressing the run risk posed by these new types of money should be *taxation*. In this Article we defend our preference for *corrective* taxation (think carbon taxes or "sin" taxes on cigarettes) and begin the

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32. The proposal for Bitcoin as a peer-to-peer system was Nakamoto's solution to the costs and weaknesses of "trusted third party" banking institutions. SATOSHI NAKOMOTO, BITCOIN: A PEER-TO-PEER ELECTRONIC CASH SYSTEM (Oct. 31, 2008), https://bitcoin.org/bitcoin.pdf [perma.cc/MG42-NQSF].

33. DAVID DUONG, STABLECOINS AND THE NEW PAYMENTS LANDSCAPE 1 (Aug. 5, 2024) (comparing the average cost of a traditional remittance, 6.35%, and the cost of a remittance through stablecoin, 0.5-3.5%), https://coinbase.bynder.com/m/2bbf091481cb30cb/original/Market-Intelligence-Stablecoins-and-Payments.pdf [web.archive.org/web/20251107012823/https://coinbase.bynder.com/m/2bbf091481cb30cb/original/Market-Intelligence-Stablecoins-and-Payments.pdf].

34. *See supra* note 6 (describing MICAR and the GENIUS Act).

35. *See supra* notes 6 and 19.

work of describing and developing a regulatory tax on these new types of money.

Our proposed tax, which we refer to as a "Coin Tax," would be levied on the issue (and downstream transfers) of these new types of risky money, following the archetype of a typical corrective Pigouvian tax.[36] The Coin Tax would be designed to force the users of new types of money, such as stablecoin, to internalize the social costs of their actions (i.e., the financial contagion risks to third parties). In standard Pigouvian fashion, the tax should therefore reduce the activity taxed, and in doing so reduce the social harms brought by the taxed activity. So, just as carbon taxes discourage carbon production and reduce environmental degradation, Coin Taxes should discourage the creation and exchange of new risky money and in doing so reduce the potential social costs risked by their failure.

Our Article makes several significant contributions to the banking and tax law literature. First, it develops a conceptual framework that better captures the problems with certain (largely) unregulated coins that are subject to runs, allowing us to diagnose the social costs that they inflict more precisely and to evaluate possible remedies more effectively. Previous legal scholarship on stablecoins and shadow banking has persuasively identified their potential for significant social harm[37] but has not explicitly identified the underlying cause of such harm: financial contagion generated by under-insurance. Nor has the previous work systematically evaluated the range of tools available to regulators to combat the under-insurance problem. Concretely specifying the harm new money poses is now critical, as several other potential harms of these new types of money have been tentatively addressed by recent legislation—yet under-insurance and contagion risk remain unaddressed.[38] Second, the Article proposes a novel policy tool to target such harm: a Coin Tax. The Article contextualizes this tax, discusses its conceptual and historical analogues, analyzes its main design features, and adumbrates further lines of empirical investigation to effectively implement it. In doing so, the Article provides an effective policy tool to address banking law's "central" problem[39] in a variety of contexts. Third, from a methodological perspective, the Article connects literatures that have until now been unfortunately siloed: (i) the banking law literatures on the regulation of private money and bank runs and (ii) the tax law literature on corrective taxes.[40] Connecting them is generative, because it illuminates possible

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36. The term "Pigouvian" (or sometimes "Pigovian") is derived from the economist who classically proposed the idea in the context of pollution, Arthur Cecil Pigou. *See* ARTHUR C. PIGOU, THE ECONOMICS OF WELFARE (4th ed. 1932). In a nutshell, the term generally refers to a tax that imposes an action's social costs (or the action's "negative externalities") on an actor who does not bear or account for them, forcing him to fully internalize his action's social costs.

37. *See, e.g.*, PRESIDENT'S WORKING GRP. ON FIN. MKTS., REPORT ON STABLECOINS (2021), https://home.treasury.gov/system/files/136/StableCoinReport_Nov1_508.pdf [perma.cc/N9MG-GW2M]. *See also supra* note 7 (listing scholarly work identifying the financial stability risks of stablecoin).

38. *See supra* note 19.

39. *See* MORGAN RICKS, THE MONEY PROBLEM: RETHINKING FINANCIAL REGULATION 182 (2016).

40. The work at this intersection has been surprisingly thin and, to the extent it exists, has been undertaken by economists focused on general financial stability problems and on the general theoretical advantages of taxes over regulation in an optimal world. *See, e.g.*, John H. Cochrane, *Toward a Run-Free*

avenues for complementing traditional banking law tools on hard-to-regulate entities (e.g., shadow banking) with alternative legal tools.

Our Article proceeds as follows. Part I first sets out some relevant background and identifies crucial distinctions for the analysis to follow. We first discuss the type of "new money" that we seek to analyze in this Article, noting a few distinctive characteristics that drive our scholarly interest (and policymakers' worries). Next, we discuss the crucial distinction between the risk of insolvency versus the risk of illiquidity for banking (and banking-like institutions). In this vein we introduce and describe the basic parameters of the Diamond-Dybvig model for bank runs, which crucially demonstrates how even healthy and well-regulated banks can fail when a liquidity problem becomes a solvency problem. We then define the precise "problem" that we are addressing in this Article: the problem of "financial contagion," whereby a firm's failure catalyzes broader instability, bringing other firms down with it. In the final section of Part I, we describe the various legal instruments that have historically been used to address the problem of bank runs and financial contagion. Here, we discuss the core aspects of public insurance, bailouts, lender-of-last-resort schemes, and suspension of convertibility.

Part II is an evaluation of the various historical tools for limiting contagion in the context of this new form of private money and concludes that public insurance, suspension of convertibility, and bailouts are inadequate mechanisms.

Part III argues that taxation is the best alternative for regulating stablecoin. We introduce our idea for a Coin Tax and explain the way in which the proposed instrument has features of classic Pigouvian taxes (i.e., the instrument addresses a negative externality, financial contagion, that is left uncorrected by the market) but also has some crucial distinctions that would affect its design and implementation. Further, we discuss some basic design parameters for a Coin Tax and highlight its distinct advantages (e.g., tax incidence, administrability) over traditional regulatory tools, highlighting Coin Taxes' potential in addressing other problematic areas of our banking system.

I. BACKGROUND

A. Redeemable Fungible Tokens: Stablecoin and Beyond

As we mentioned above, the current paradigmatic example of the new, largely unregulated and uninsured types of money that threaten broad financial contagion is "stablecoin."[41] In common usage, the term stablecoin has come to describe a type

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Financial System, *in* ACROSS THE GREAT DIVIDE: NEW PERSPECTIVES ON THE FINANCIAL CRISIS 197, 217–18 (Martin Neal Baily & John B. Taylor eds., 2014).

41. Regulators have expressed deep concern over the current, and future, risks that stablecoin poses to financial stability. *See, e.g.*, Janet L. Yellen, Secretary, Treasury Dep't, Remarks from Secretary of the Treasury Janet L. Yellen on Digital Assets (Apr. 7, 2022), https://home.treasury.gov/news/press-releases/jy0706 [perma.cc/62SJ-9TFU]; Fabio Panetta, *supra* note 25; PABLO D. AZAR ET AL., FED. RSRV. BANK OF N.Y., STAFF REP. NO. 1034, THE FINANCIAL STABILITY IMPLICATIONS OF DIGITAL ASSETS 1 (2022).

of cryptocurrency that is—unlike better known crypto-assets such as Bitcoin or Ethereum—relatively stable in value. Stablecoin is a blockchain-based digital asset which allows one to readily convert highly volatile cryptocurrency into an assertedly stable digital asset in a digital wallet.[42] It is not difficult to subsequently convert stablecoin into fiat currency (e.g., U.S. dollars or Euros) or bank deposits denominated in fiat currency on various exchanges that offer that functionality (e.g., Coinbase or Binance). As we discussed, stablecoins are "like bank deposits";[43] however, they are not within the banking law regulatory perimeter and are therefore not regulated as such.[44] Consequently, they pose problems to our system similar to those posed by "unregulated" banks.

But stablecoin is not the only new money instrument that poses financial contagion risks to our financial system. Older instruments that are bank equivalents, such as money market funds (MMFs)[45] or repurchase agreements (repos)[46] have long been understood to suffer from similar bank run dynamics that banks—especially unregulated banks—do.[47] Further, current instruments, such as stablecoins, are evolving in ways that might make them more difficult to categorize, regulate, or contain. Some are turning themselves into decentralized instruments or collateralizing coins with NFTs (rather than assets with intrinsic value) and then having the NFTs reference assets with intrinsic value.[48]

Future instruments will undoubtedly pose similar risks, but—crucially—these future instruments could prove both more interconnected with the "real" (non-digital) economy than the stablecoins of today. Imagine Amazon, following Facebook's failed attempt at Libra, decided to get into the money business and issued a dollar-denominated coin (the "Bezos") redeemable one-to-one for U.S. dollars.[49] Amazon would have plenty of economic incentives to create its own

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42. *See* Emily Nicolle and Muyao Shen, *Tether Loses Dollar Peg as Crypto Anxiety Hits No. 1 Stablecoin*, BLOOMBERG (Mar. 12, 2022), https://www.bloomberg.com/news/articles/2022-05-12/tether-moves-to-reassure-market-after-biggest-stablecoin-slips [web.archive.org/web/20250205105303/https://www.bloomberg.com/news/articles/2022-05-12/tether-moves-to-reassure-market-after-biggest-stablecoin-slips] (reporting Tether's value fell from $1 to 94.55 cents); *see also* Ashley Capoot, *Stablecoin USDC Breaks Dollar Peg After Firm Reveals It Has $3.3 Billion in SVB Exposure*, CNBC (Mar. 11, 2023), https://www.cnbc.com/2023/03/11/stablecoin-usdc-breaks-dollar-peg-after-firm-reveals-it-has-3point3-billion-in-svb-exposure.html [perma.cc/NF39-HG4L] (reporting that USD Coin's value fell from one dollar to eighty-seven cents).

43. *See supra* note 7.

44. *See, e.g.*, Gorton & Zhang, *supra* note 7, at 919-35.

45. *See, e.g.*, Dan Awrey, *Unbundling Banking, Money, and Payments,* 110 GEO. L.J. 715, 767–68 (2022) (discussing MMF's lack of regulation and vulnerability to runs, and policymakers' recent unsuccessful efforts to regulate them).

46. *See, e.g.*, Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 J. FIN. ECON. 425, 446–48 (2012) (discussing the repo market, its vulnerability to runs, and its role in catalyzing and amplifying the financial crisis that led to the Great Recession).

47. That is true at least since the Great Recession, where their potential for systemic effects became evident. Edward Simpson Prescott, *Introduction to the Special Issue on the Diamond-Dybvig Model*, 96 FED. RSRV. BANK RICHMOND ECON. Q. 1, 2–6 (2010) (listing several markets that experienced bank-run dynamics leading to the Great Recession, including MMFs and repos)

48. *See* Stafford, *supra* note 6.

49. *See* Mitchell A. Kane, *Exit, Voice and Electivity: Confronting the Rise of Private Money and*

money, from reduced transaction fees to increased customer "stickiness." And Amazon could easily do it. The company currently has a market capitalization of more than $2 trillion.[50] For comparison, Tether, the largest stablecoin, has a market capitalization of around $115 billion,[51] not far from Amazon's *cash reserves* of around $75 billion.[52] In an instant, Amazon could issue the Bezos, promise dollar convertibility premised on its vast cash reserves, and immediately compete with Tether—the dominant stablecoin issuer.

There are aspects that could make the Bezos even more disruptive from a financial stability perspective than existing stablecoins. Amazon could, following the blueprint of its previous money losing strategies for explosive growth, offer advantages for payment in Bezos, such as rebates of x percent on purchases on Amazon. Amazon is expected to process almost $650 billion in retail sales this year in the United States alone.[53] Converting just a portion of these transactions into Bezos would not only make the Bezos one of the largest circulating coins, but would—perhaps more importantly and dangerously from a financial stability perspective—integrate the Bezos into a significant portion of the e-commerce in the United States, operating in millions of homes and throughout the world. In doing so, Bezos would become much more integrated with non-crypto parts of the economy than current stablecoins (such as Tether).

Now imagine that Amazon had even bigger ambitions. It could seek to forge a consortium that accepted the coin as payment with other tech giants, such as Apple, Microsoft, and Alphabet. Some back-of-the-envelope math can quickly demonstrate the magnitude of such a tie-up.[54] The combined market capitalization of these four giants exceeds $10 trillion.[55] A ten percent annual return on market capitalization would yield $1 trillion. For context, that would be enough to place the

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Private Taxation (Jan. 2026) (unpublished manuscript, on file with author) (hypothesizing introduction of the "Bezos" and its potential to displace sovereign-issued fiat currency).

50. *Amazon.com Inc.*, YAHOO FIN., https://finance.yahoo.com/quote/AMZN/ [perma.cc/QJJ7-SDSN] (last visited July 12, 2024) (estimating a market capitalization of $2.03 trillion).

51. *See Tether*, COINMARKETCAP, https://coinmarketcap.com/currencies/tether/ [perma.cc/E53V-SWKT] (last visited July 12, 2024).

52. *See* AMAZON, 2023 ANNUAL REPORT 40 (2024), https://s2.q4cdn.com/299287126/files/doc_financials/2024/ar/Amazon-com-Inc-2023-Annual-Report.pdf [perma.cc/E5C7-WZ7S].

53. *See Amazon Sales Forecast Dashboard*, MOMENTUM COM. (2024), https://www.momentumcommerce.com/velocity/apps/monthly-forecast?node=-1 [perma.cc/VL25-N9TL] (forecasting of $641.3 billion of retail sales for 2024).

54. This tie-up is not so unlikely. When Facebook sought to unsuccessfully launch Libra, it was able to convince the likes of Uber, Vodafone, Spotify, Visa, and Mastercard to join its alliance in using Libra. *See* Hannah Murphy, *Facebook Libra: The Inside Story of How the Company's Cryptocurrency Dream Died*, FIN. TIMES (Mar. 10, 2022), https://www.ft.com/content/a88fb591-72d5-4b6b-bb5d-223adfb893f3 [perma.cc/VUT7-KH98].

55. The number currently hovers around ten trillion dollars. *See supra* note 43 (estimating Amazon's market capitalization at $2.03 trillion); *Apple*, YAHOO FIN., https://finance.yahoo.com/quote/AAPL/ [perma.cc/8VDC-PERN] (last visited July 12, 2024) (estimating a market capitalization of $3.49 trillion); *Microsoft*, YAHOO FIN., https://finance.yahoo.com/quote/MSFT/ [perma.cc/QQ4E-J26V] (last visited July 12, 2024) (estimating a market capitalization of $3.38 trillion); *Alphabet*, YAHOO FIN., https://finance.yahoo.com/quote/GOOG/ [perma.cc/MYH8-LKGW] (last visited July 12, 2024) (estimating a market capitalization of $2.30 trillion).

consortium on the nineteenth place in the world in terms of gross domestic product—around the size of Switzerland or Saudi Arabia.[56] That is, it is not unthinkable for a (risky and unregulated) redeemable coin to quickly become a currency rivalling widely used *sovereign* currencies. As such, our analysis does not only consider the risks posed by current instruments, such as stablecoin, but also applies to the potentially catastrophic risks posed by future instruments.[57]

So, we need a term that both captures instruments such as "traditional" stablecoin, its current evolutions, and future instruments such as the Bezos. Moreover, we need a term that focuses on the features that make these types of new money worrisome from our perspective—the features that potentially make them vulnerable to runs and cause contagion risk.

We will therefore use the term Redeemable Fungible Token (RFT) to refer to the types of instruments that pose the problems that concern us (and regulators). We focus on two features of these new forms of private money. The first is that RFTs are easily *redeemable*. That is, a token holder can request to convert her coin into fiat currency or an equivalent. Just as traditional bank depositors are able to withdraw their deposits for dollars, stablecoin (or Bezos) holders are able to redeem their tokens and receive fiat currency. This feature—the ability to redeem—makes RFTs vulnerable to runs in the same way that banks are.[58] Second, RFTs are *fungible*. That is, they are not unique and can easily be used as a method of exchange, mimicking the convenience of cash and other types of money.

Keep in mind a couple of technical distinctions. An RFT should be distinguished from fiat cryptocurrency (like Bitcoin), which is not redeemable by the issuer into either fiat sovereign currency (e.g., dollars) or fiat currency equivalents (e.g., Treasury bills, gold). (To "convert" Bitcoin into cash, one must sell it to somebody else, not redeem from the issuer.) It should also be distinguished from NFTs, which are neither fungible nor redeemable. And lastly, we distinguish RFTs from tokenized bank deposits which are account-based and thus not fungible across the various tokens issued by the issuer, therefore lacking some of the convenience that RFTs provide to their holders.

As sketched in the introduction, RFTs possess certain key features of bank deposits. But RFTs are critically not bank deposits. The term "deposit" has particular regulatory significance and, at least under current law, does not apply to RFTs.[59] Similarly, RFT issuers share crucial features of banks, but are not banks for

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56. *See GDP Ranking*, WORLD BANK (June 30, 2024) https://datacatalog.worldbank.org/search/dataset/0038130/GDP-ranking [perma.cc/QR64-5TCH].

57. *See* Saule T. Omarova & Graham S. Steele, *Banking and Antitrust*, 133 YALE L.J. 1162, 1249–52 (2024) (discussing political and economic power concentration implications of the success of such an instrument).

58. This insight is not novel. Scholars have recently warned of stablecoins' vulnerability to runs. *See, e.g.*, Gorton & Zhang, *supra* note 7, at 915–35; Calderón Gómez, *supra* note 7, at 606–14; Awrey, *supra* note 7, at 45. Banking regulators have similarly worried about stablecoins' vulnerability to bank runs. *See supra* note 34.

59. See Gorton & Zhang, *supra* note 7, at 920–29 (discussing how stablecoins are not "deposits"). *See also* Awrey, *supra* note 7, at 43–55 (2020) (discussing the inadequacy of the regulatory

regulatory purposes.[60] Regarding overlap of features, consider three. First, banks and RFT issuers are each a type of financial intermediary that may engage in *maturity transformation*. That is, they receive funds from net savers and deliver funds to net borrowers, but on different temporal terms (e.g., "I hold your deposits for an indefinite amount of time determined by you and use them to lend to an entrepreneur who needs a loan for a fixed amount of time").[61] Net savers retain rights to receive funds back at a time that is earlier than the date on which net borrowers must repay loans. Second, the intermediaries promote the *facilitation of payments*. A traditional bank may allow an account holder the ability to pay at point of service with a debit card; the issuer of RFTs may create a mechanism allowing direct transfer of the RFTs via digital wallet. Third, the intermediaries usually collateralize deposits in some fashion,[62] seeking to prove their value to depositors. This *collateralization* is heavily regulated and federally insured in the case of banks within the FDIC network. This collateralization is effectively unregulated in the case of RFT issuers.[63]

In our discussion below, we will assume that what functionally ties banks and RFT issuers into the same class (regardless of legal terminology and characterization under the "bank" label) of financial intermediaries is the presence of maturity transformation, facilitation of payments, and a degree of collateralization. As we will see below, these functional variables affect each other in important ways. For example, maturity transformation is an important function in the economy. Intermediation between short-term lenders and long-term borrowers has value. But maturity transformation negatively impacts collateralization because it makes the intermediary's collateral less liquid even though the intermediary has pledged to meet requests for funds from savers on demand. That risk of illiquidity can lead to panic, bank runs, and financial contagion. But the dynamics at work here are subtle, as discussed in the next section.

B. Insolvency Risk versus Illiquidity Risk

Understanding the problem of contagion, and the options available to regulators, should be informed by the theoretical underpinnings of modern thinking on bank runs. Diamond and Dybvig developed the seminal economic model of bank runs, showing how even "healthy" regulated banks can nonetheless be vulnerable to bank runs.[64]

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framework for money services businesses).

60. Gorton & Zhang, *supra* note 7, at 929-35 (discussing why stablecoins are not "banks").

61. This definition of maturity transformation is standard, even in accounts that question the relevance of maturity transformation (and maturity mismatches) to current banking regulation. *See* Itamar Drechsler, Alexi Savov & Philipp Schnab, *Banking on Deposits: Maturity Transformation Without Interest Rate Risk*, 76 J. Fin. 1091, 1091–92 (2021).

62. That might be by maintaining reserves of valuable assets (*e.g.*, U.S. dollars, Treasury bills, or gold), or, for example, by having an algorithmic mechanism that purports to maintain depositors' trust in the stability of the coin.

63. *But see supra* note 6 (discussing the EU's MiCAR).

64. Douglas W. Diamond & Phillip H. Dybvig, *Bank Runs, Deposit Insurance, and Liquidity*,

Traditional banking analysis distinguished between solvency and liquidity problems in the context of bank runs. A healthy (that is, solvent) bank may lack sufficient liquidity to meet the demands of all depositors. It is, of course, an inherent feature of fractional reserve banking (i.e., our current model of banking, where a bank invests a portion of its deposits, keeping another portion as its reserves to redeem deposits) that a solvent bank cannot meet the demands of all depositors at once, but rather can meet demands only up to the level of reserves required to be held. But when will depositors in fact demand funds in excess of reserves? It is no surprise that if a bank is insolvent or failing, then all depositors will rationally seek to get funds out as soon as possible and thus trigger a run. But Diamond and Dybvig show how run risk is present for solvent banks as well.

A simplified version of their model[65] will suffice to highlight the prisoner's dilemma inherent in banking and to display the dynamics that Diamond and Dybvig highlighted in their Nobel Prize-winning contributions. Suppose that a bank has three depositors who deposit identical amounts (i.e., each depositing 33% of the bank's total deposits). All depositors benefit from having their deposits at the bank and would prefer to continue having their deposits at the bank, receiving interest from the bank for doing so. Consistent with applicable regulatory reserves requirements, the bank lends 50% of its deposits to an entrepreneur for a fixed period of time, who invests the borrowed amounts at a high rate of return.[66] In exchange, the bank charges the entrepreneur an interest rate that allows it to pay for the interest rates to depositors and earn a reasonable profit. However, the entrepreneur's investment requires that the capital be deployed for a fixed period of time—so the entrepreneur is unable to repay the bank in full on demand. The bank is "healthy" and solvent: that is, the bank's assets (i.e., loan extended to entrepreneur, initial capital, and deposits held in liquid form) exceed its liabilities (i.e., demand deposits by the depositors).

As should be evident, this arrangement presents an equilibrium for all parties. The bank makes a profit in the interest rate differential between its loan to entrepreneur and the interest paid on deposits to the depositors. The depositors are also better off: They like having their money in the bank, and they earn an interest rate on their deposits. Lastly, so is the entrepreneur: She is able to invest the capital at a high rate of return and pay off the interest on her loan, keeping the rest as profit.

But, due to the loan to the entrepreneur, the bank is unable to redeem two or more full deposits at a time (because it only has 50% reserves but would need 66% for two withdrawals). A bank's inability to fully convert all deposits at any moment due to reserve requirements (again, a ubiquitous feature of fractional reserve banking) means that this equilibrium is unstable and the bank is vulnerable to

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91 J. POL. ECON. 401, 402 (1983).

65. For a simplified version of this model, see, for example, Calderón Gómez, *supra* note 7, at 618–20 (2023); ROBERT GIBBONS, GAME THEORY FOR APPLIED ECONOMISTS 73–75 (1992).

66. *See supra* note 6 (discussing MiCAR).

depositor runs: If two depositors seek to get their deposits out, the bank will only be able to honor half of the withdrawal from the second depositor (up to the bank's 50% reserves), and will have to try to force the entrepreneur to repay amounts on its loans.[67]

A simple dynamic underlies the depositors' tendencies to run on the bank. Depositors might see themselves in a prisoner's dilemma: Although they are better off cooperating and keeping their money in the bank (earning an interest rate), they cannot all withdraw their money at the same time. If they happen to need cash and are second in line, they will only receive partial repayment—and the last depositor in line will not be able to get anything from the bank! As such, the depositors have a strong incentive to avoid being the "slowest." That leads to another equilibrium: a "preemptive" run on the bank by the depositors hoping not to be the last ones to withdraw.[68]

A key feature of this model is that runs can happen even in the presence of otherwise optimal conditions. For example, the depositors need not (i) be irrational nor (ii) possess information that the bank is insolvent in order to run. Incomplete or imperfect information will do the trick. A mere lack of perfect information (e.g., knowing for certain that every other depositor also prefers leaving their money in the bank indefinitely)[69] is sufficient to trigger a run.[70] Similarly, lacking perfect information about the bank's financial position might mean that noisy signals (e.g., general capital markets turmoil) can cause depositors to run on the bank—even if the bank's investments are not involved in such turmoil and the bank remains solvent, but illiquid.[71] Lacking (i) perfect information about other depositors' preferences for liquidity and about the bank's financial condition and (ii) a cooperation mechanism that could break an impasse, depositors will thus act rationally in seeking to get their money out of the bank and fuel a devastating run on the bank.

Another key result of the model is that the bank need not be unhealthy or badly regulated for it to fall victim to a run. In our example above, the bank is solvent (i.e., its assets exceed its liabilities) and is properly capitalized.[72] Yet a mere liquidity mismatch—a mismatch intrinsic to the business of banking[73]—can be

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67. Diamond & Dybvig, *supra* note 64.

68. *See* GIBBONS, *supra* note 65 (summarizing this dynamic in a simple prisoner's dilemma model).

69. The Diamond-Dybvig model shows how if the distribution of liquidity preferences in the depositors is stochastic, then deposit insurance is needed to ensure that depositors' ignorance of others' liquidity preferences does not trigger a run. *See, e.g.*, Diamond & Dybvig, *supra* note 64, at 411.

70. *See, e.g.*, Diamond & Dybvig, *supra* note 64, at 403.

71. *See* Gary Gorton, *Bank Suspension of Convertibility*, 15 J. MON. ECON. 177 (1985).

72. This capitalization figure is merely an assumption that does not change the model's main results but is rather adopted to clearly show the difference between a liquidity crisis, a solvency crisis, and when a liquidity crisis can turn into a solvency one. Other models, for example, operate with the simplified (but unrealistic) assumption that the bank lacks sufficient liquidity to honor a single deposit in a two-person game. *See, e.g.*, Martin Brown et al., *Understanding Bank-Run Contagion* 6–7, (Eur. Cent. Bank, Working Paper Series No. 1711, 2014), https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1711.pdf [perma.cc/3SA4-LW9E].

73. Diamond & Dybvig, *supra* note 64, at 403 ("Illiquidity of assets provides the rationale both

enough to cause a solvency problem for the bank. Because the bank either cannot render liquid some of its investments (e.g., the long-term loan to the entrepreneur) or will suffer large losses from doing so, a *liquidity* (i.e., "I have the money, just not right now") problem can cause a *solvency* problem (i.e., "I don't have the money"). This is not the stuff of theory: Large fire sales prompted by unexpected redemptions and withdrawals amplified and deepened the Great Recession.[74]

The Diamond-Dybvig model provided a much-needed theory to frame policymakers' understandings of bank runs and has laid "the foundations of modern banking research."[75] It showed that under imperfect information, consumers were acting rationally in running on a bank—even if that bank was actually *solvent* before their run. Depositors' expectations of a bank run were therefore a self-fulfilling prophecy, and banking regulators now had to consider "preemptive" bank runs a persistent problem.

This key finding—that even solvent, not just illiquid, banks could be victims of a run driven by rational but imperfectly informed depositors—had deep implications for banking law. Even in a world of perfect balance sheet regulation—a world where regulators were magically able to accurately and efficiently assess and regulate bank's balance sheets and their deposits—banks could *still* fall victim to bank runs. In other words, "healthy" and well-regulated banks could fail. This finding controverts the longstanding historical belief that banks failed only because of their "bad management or bad banking practices, or as inevitable reactions to prior speculative excesses, or as a consequence but hardly a cause of the financial economic collapse in process."[76] The finding also bolsters the case for *public* policies

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for the existence of banks and for their vulnerability to runs.").

74. Ben Bernanke, Chairman of the Federal Reserve during the Great Recession, aptly compared the Great Recession and the 1907 panic, showing how both crises started from runs that were amplified by fire sales.

> The recent crisis echoed many aspects of the 1907 panic. Like most crises, the recent episode had an identifiable trigger—in this case, the growing realization by market participants that subprime mortgages and certain other credits were seriously deficient in their underwriting and disclosures. Pervasive uncertainty about the size and incidence of losses in turn led to sharp withdrawals of short-term funding from a wide range of institutions; these funding pressures precipitated fire sales, which contributed to sharp declines in asset prices and further losses. Institutional changes over the past century were reflected in differences in the types of funding that ran: In 1907, in the absence of deposit insurance, retail deposits were much more prone to run, whereas in 2008, most withdrawals were of uninsured wholesale funding, in the form of commercial paper, repurchase agreements, and securities lending.

See Ben S. Bernanke, Chairman, Fed. Rsrv. Bd., The Crisis as a Classic Financial Panic, Speech at the Fourteenth Jacques Polak Annual Research Conference, Washington, D.C. (Nov. 8, 2013) https://www.federalreserve.gov/newsevents/speech/bernanke20131108a.htm [perma.cc/R7RT-LZPU].

75. *See Douglas Diamond*, NOBEL PRIZE (Mar. 27, 2024), https://www.nobelprize.org/prizes/economic-sciences/2022/diamond/facts/ [perma.cc/D5Z2-UBQ8] (explaining the rationale behind awarding Diamond and Dybvig the Nobel Prize for Economics in 2022). *See* COMM. FOR THE PRIZE IN ECON. SCIS. IN MEMORY OF ALFRED NOBEL, SCIENTIFIC BACKGROUND ON THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL 2022: FINANCIAL INTERMEDIATION AND THE ECONOMY (Oct. 10, 2022), https://www.nobelprize.org/uploads/2022/10/advanced-economicsciencesprize2022.pdf [perma.cc/Y3E5-EQ4J].

76. MILTON FRIEDMAN & ANNA JACOBSON SCHWARTZ, A MONETARY HISTORY OF THE

to alleviate the risk of financial contagion, through response mechanisms rather than regulation, as we discuss in the next section.

C. Understanding Contagion Risk

A key part of our argument remains undefined: "contagion risk."[77] Let us go back to our simplified Diamond-Dybvig model, but now we can assume that we do not have just one bank, but two: First Bank and Second Bank. We need not assume that the banks in the model are deeply interconnected,[78] just that the exact nature of their interrelationship is not completely known to all depositors.[79]

Now assume, that as in the model above, depositors run on First Bank, a solvent—but illiquid—bank, causing First Bank's failure. (The underlying reason for the failure is not important.)[80] What happens next? Depositors will take the First Bank's failure and make inferences from it about the Second Bank.[81] Just as depositors might have engaged in a preemptive run based on noisy information about capital markets turmoil that made them fear for their bank's solvency, Second Bank's depositors might engage in a preemptive run on their bank when they see the First Bank fail. "Is mine next?" they will rightly wonder. Again, this type of preemptive run might start regardless of the state of Second Bank: The bank might be solvent, insolvent, liquid, or illiquid.

A run on a single bank is thus unlikely to remain contained—and will likely set off a domino effect threatening other banks. As a result, the harm of a bank's failure is not merely internal to the bank and its depositors, but rather, it will have

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UNITED STATES, 1867-1960, at 358 (2008) (describing the banking system's beliefs in the 1920s and 1930s).

77. Our use of contagion risk is relatively uncontroversial in the literature. *See, e.g.*, Augusto Hasman, *A Critical Review of Contagion Risk in Banking*, 27 J. ECON. SURVS. 978, 978 (2013) ("The term 'contagion' refers to the transmission of an idiosyncratic shock that affects one bank, or possibly a group of banks, and how this shock is transmitted to other banks or economic sectors. This notion of contagion is part of the broader concept of systemic risk, which may result from contagion or a common shock affecting all banks simultaneously.") For our purposes, distinguishing whether the contagion is information- or panic-driven is irrelevant. A large literature has sought to explore the question. *See id.* at 980–88 (reviewing the theoretical and applied literature). Laboratory evidence has suggested that both theories are partly explanatory of financial contagion. *See, e.g.*, Brown et al., *supra* note 72, at 24. We are agnostic as to which theory best explains contagion, and we have sought to frame our explanation below in a manner consistent with either theory of contagion, modeling a situation in which depositors both run for panic and information reasons.

78. Interconnectedness is a key determinant of contagion. *See* Matthew Elliott, Benjamin Golub, & Matthew O. Jackson, *Financial Networks and Contagion*, 104 AM. ECON. REV. 3115, 3116–17 (2014).

79. Knowledge of interconnectedness would of course make the domino effect dynamics of a bank run much more dramatic. *See* Gary Gorton & Andrew Metrick, *Securitized Banking and the Run on Repo*, 104 J. FIN. ECON. 425 (2012). A large empirical literature has sought to study the precise mechanisms that propagate financial contagion. *See* Hasman, *supra* note 77, at 980–88; Rajkamal Iyer & José-Luis Peydró, *Interbank Contagion at Work: Evidence from a Natural Experiment* (Eur. Cent. Bank, Working Paper No. 1147, 2010), https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1147.pdf [perma.cc/6YG4-DEQQ]. *See also* Viral V. Acharya & Tanju Yorulmazer, *Information Contagion and Bank Herding*, 40 J. MONEY, CREDIT & BANKING 215 (2008) (modelling how contagion spreads through information about banks' common investment returns).

80. *See, e.g.*, Iyer & Peydró, *supra* note 79 (finding that an idiosyncratic failure due to fraud has negative contagion effects on other banks if the banks have credit exposure to one another).

81. *See* Brown et al., *supra* note 72.

external effects. Such a failure will likely harm a variety of third parties, such as the Second Bank's depositors and borrowers, who might have only a tenuous connection to the failed First Bank. For a recent example, just consider how Silicon Valley Bank's announcement that it would realize a $1.8 billion loss to increase its liquidity to fund increased demand for deposit withdrawals[82] caused a banking panic on both sides of the Atlantic, with several large bank failures (including that of Silicon Valley Bank).[83]

Now let us return to our definition. We can think of "contagion risk" as the risk imposed by the First Bank on the Second Bank, Second Bank's depositors, and other counterparties. Assume First Bank was deciding how to run its business and chose a business model that produced higher net returns to its shareholders but was overall riskier (i.e., had a higher probability of resulting in a bank failure and the resulting contagion). We could say that there is an *externality* to First Bank's decision to engage in a risky business model. That is, First Bank is disregarding external social costs (the costs of financial contagion on Second Bank and its counterparties) in making its business decisions.

As we will see later, RFTs work in a similar way. Yet they operate outside of the regulatory perimeter, in an opaque, risky, and uninsured fashion. As such, the critical insight is that—relative to other banks—we view RFTs as posing a similar *externality* on society as First Bank: They functionally operate a risky, largely unregulated, and uninsured bank, which poses increased external contagion risks to society.

D. Available Public Instruments to Address Contagion Risk

Policymakers have no shortage of instruments to address the contagion risk produced by bank runs, however. This section will provide a brief overview of their options. First and foremost, banking regulators throughout the world have settled on public insurance, such as the FDIC deposit insurance in the United States, as the tool of choice to prevent bank runs and their spread. Second, despite their unpopularity, governments throughout the world have regularly used bailouts of financial institutions in stress to prevent broader contagion. Third, and relatedly, policymakers have used lender-of-last-resort programs paired with regulatory schemes to allay contagions. Fourth, while currently out of vogue, policymakers (and banks themselves) have historically suspended the convertibility of deposits in times of crisis to allay panics.

1. Public Deposit Insurance

Public insurance of bank deposits has been widely seen as the antidote to the

82. Jonathan Weil & Ben Eisen, *Banks Lose Billions in Value After Tech Lender SVB Stumbles*, WALL ST. J. (Mar. 9, 2023), https://www.wsj.com/articles/bond-losses-push-silicon-valley-bank-parent-to-raise-capital-125e89d4?mod=article_inline [perma.cc/2DB4-S789].

83. *See* Candice Choi, *The Banking Crisis: A Timeline of Key Events,* WALL ST. J. (May 11, 2023), https://www.wsj.com/articles/bank-collapse-crisis-timeline-724f6458 [perma.cc/2SKN-A2GJ]. *See* Iyer & Peydró, *supra* note 79.

vulnerabilities highlighted by the Diamond-Dybvig model.[84] As Milton Friedman and Anna Jacobson wrote in their seminal work on monetary history, deposit insurance was the "structural change most conducive to monetary stability,"[85] which has made "bank failures a rarity"[86]—at least with respect to traditional regulated banks.[87] Governments have adopted these schemes worldwide[88] and multilateral economic organizations are constantly recommending these schemes.[89]

In the United States, public insurance has been regulators' most prominent policy tool to stop bank runs, with quite a successful domestic history of stopping traditional runs.[90] As Bernanke notes, "The most familiar type of panic that has occurred historically, involving runs on banks by retail depositors, ha[s] been made largely obsolete by deposit insurance, central bank backstop liquidity facilities, and the associated government supervision of banks."[91]

Deposit insurance has a long history in the U.S. banking system. Bank deposit insurance first appeared in Oklahoma in 1907, right after a series of bank runs that year.[92] The Oklahoma experiment quickly expanded and within a decade, seven other states adopted deposit insurance.[93] However, efforts to pass it at a federal level stalled, with forty-five bills introduced in the first decade of the twentieth century.[94] Not until 1933 did Congress pass federal deposit insurance and only did so as a temporary measure.[95]

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84. *See, e.g.,* FRIEDMAN & SCHWARTZ, *supra* note 76, at 12. To a considerable extent, public insurance is still seen as the antidote to such vulnerabilities. In discussing the Great Recession, Ben Bernanke noted that a "key vulnerability of the [financial] system was the heavy reliance on the shadow banking sector, as well as some of the largest banks, on various forms of short-term wholesale funding." Yet unlike traditional banks, shadow banks do not "benefit from a government-provided safety net, including deposit insurance and backstop liquidity", making this slice of the financial sector vulnerable to a run "reminiscent of the banking panics of an earlier era." Ben S. Bernanke, Chairman, Fed. Rsrv. Bd., Some Reflections on the Crisis and the Policy Response, Speech at the Russell Sage Foundation and The Century Foundation Conference on "Rethinking Finance," New York, N.Y. (Apr. 13, 2012), https://www.federalreserve.gov/newsevents/speech/bernanke20120413a.htm [perma.cc/S4R3-3BHC].

85. *See* FRIEDMAN & SCHWARTZ, *supra* note 76, at 434.

86. *See* FRIEDMAN & SCHWARTZ, *supra* note 76, at 11

87. *See* GARY GORTON, MISUNDERSTANDING FINANCIAL CRISES: WHY WE DON'T SEE THEM COMING 27 (2012) ("Deposit insurance was another success, as no further systemic crises were experienced in the United States [from 1933, when it was initially implemented,] until 2007").

88. Asli Demirgüç-Kunt, Edward Kane & Luc Laeven, *Deposit Insurance Database* 11 (IMF, Working Paper WP/14/118, 2014) https://www.imf.org/external/pubs/ft/wp/2014/wp14118.pdf [web.archive.org/web/20251117141958/https://www.imf.org/external/pubs/ft/wp/2014/wp14118.pdf].

89. *See, e.g.*, Samuel H. Talley & Ignacio Mas, *Deposit Insurance in Developing Countries* (WORLD BANK WPS 548, 1990), http://documents.worldbank.org/curated/en/720291468172458661/Deposit-insurance-in-developing-countries [web.archive.org/web/20190731152440/http://documents.worldbank.org/curated/en/720291468172458661/Deposit-insurance-in-developing-countries].

90. Bernanke, *supra* note 84 ("The most familiar type of panic that has occurred historically, involving runs on banks by retail depositors, ha[s] been made largely obsolete by deposit insurance, central bank backstop liquidity facilities, and the associated government supervision of banks.").

91. Bernanke, *supra* note 84.

92. GORTON, *supra* note 87, at 136.

93. Carter H. Golembe, *The Deposit Insurance Legislation of 1933: An Examination of Its Antecedents and Its Purposes*, 75 POL. SCI. Q. 181, 187 (1960).

94. *Id.* at 188.

95. Banking Act of 1933, Pub. L. No. 73–66, § 8, 48 Stat. 162 [hereinafter Banking Act of 1933];

The Banking Act of 1933 established the Federal Deposit Insurance Corporation (FDIC).[96] The FDIC would serve to insure deposits in covered banks, up to a certain limit. The limit was initially set at $2,500,[97] and is currently set at $250,000 per depositor per bank.[98] The FDIC generally compensates depositors of a failed bank quickly, usually paying the insured deposit amount within days.[99] The FDIC pays such amounts from its fund, set to a minimum percentage of the estimated deposits the FDIC insures, currently set at 1.35%.[100] Those funds are raised through *ex ante* periodic insurance premiums paid by covered banks, and by *ex post* extraordinary assessments levied on members to make up for any fund shortfall.[101] As of 2023, the FDIC insured deposits of $10.6 trillion.[102] Apart from insuring deposits, the FDIC has a broad mandate, including bank supervision responsibilities[103] and managing the resolution and receivership of failed banks.[104]

The politics of (and rationale behind) public insurance were not always straightforward. Gorton highlights the popularity of deposit insurance in the early twentieth century, noting how deposit insurance was "an outcome of the Populist movement, the largest mass movement in U.S. history."[105] This movement was not primarily worried with the protection of small depositors from bank failures, however. Golembe notes that "it [was] to restore to the community, as quickly as possible, circulating medium destroyed or made unavailable as a consequence of bank failures."[106] (Concerns about moral hazard were not unheard of at the time of deposit insurance's passage—yet they did not meaningfully detract from the

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see also GORTON, *supra* note 87, at 136.

96. Banking Act of 1933, §8.

97. Banking Act of 1933, §8.

98. The $250,000 limit was permanently set by the Helping Families Save Their Homes Act of 2009, Pub. L. No. 111-22, § 204(a). The 250,000 limit applies per bank, per depositor, per ownership category. The "ownership category" in which the depositor holds the deposit (*e.g.*, a single deposit account, a retirement account, a joint deposit account) will also allow a depositor to get extra coverage at a given bank. *See Deposit Insurance FAQs*, FDIC (Apr. 1, 2024), https://www.fdic.gov/resources/deposit-insurance/faq/index.html [perma.cc/W55G-NHBK].

99. *Deposit Insurance FAQs*, *supra* note 98. According to the FDIC, in 2023, depositors received their insured funds within two business days. *See* FDIC, ANNUAL REPORT 2023, at 80 (2024), https://www.fdic.gov/about/financial-reports/reports/2023annualreport/2023-arfinal.pdf [perma.cc/M9MT-6BFV] [hereinafter *FDIC 2023 Annual Report*].

100. Dodd-Frank Act, Pub. L. No. 111–203, § 332, 124 Stat. 1376.

101. After the 2023 banking panic and the failure of two large banks, the FDIC experienced around $22 billion in losses. That resulted in the FDIC's deposit insurance fund falling below its 1.35 fund reserve ratio. As a result, the FDIC issued a special assessment to members with at least $5 billion in uninsured deposits, as a significant part of the shortfall was due to the payout of uninsured deposits in the failed banks. *See FDIC 2023 Annual Report*, *supra* note 91, at 28–29.

102. FDIC, ANNUAL REPORT 2023, *supra* note 99, at 6.

103. For an overview of the FDIC's recent work on bank supervision, see *id.* at 31-51.

104. For an overview of the FDIC's recent work on failed bank receivership and resolution, including its work on the failures of Silicon Valley Bank, First Republic, and Signature Bank, see FDIC, ANNUAL REPORT 2023, *supra* note 99, at 79–85.

105. GORTON, *supra* note 87, at 137–38.

106. Carter H. Golembe, *The Deposit Insurance Legislation of 1933: An Examination of Its Antecedents and Its Purposes*, 75 POL. SCI. Q. 181, 189 (1960). *See also* GORTON, *supra* note 87, at 138 ("People wanted insurance because they did not want panics.").

enthusiasm of deposit insurance supporters who desperately wanted to stop panics.)[107] Therefore, we can see public insurance as a popular effort to prevent panics and bank runs—rather than merely as a way for depositors to protect their own holdings.

While deposit insurance has had a relatively successful history in stopping traditional bank runs in the United States (i.e., bank runs on traditional regulated banks), deposit insurance is not a panacea. International experience has been highly disappointing. As of 2013, 112 countries had explicit deposit insurance, with the International Monetary Fund and other economic institutions constantly advising countries to adopt public insurance schemes.[108] But studies about deposit insurance's effectiveness worldwide show that these schemes do not generally reduce bank instability—and, in fact, some schemes actually encourage bank risk-taking and increase bank instability.[109] Some of these effects might be due to design issues, as only a small minority of countries have adjusted their premiums to risk,[110] and most of the schemes are (partly or wholly) privately funded—as opposed to being funded publicly.[111] Yet the experience abroad shows that public insurance does not always work and that a specific regulatory context is needed to successfully address potentially fatal moral hazard issues.

2. Bailout

A somewhat derided, yet often used, tool to stop financial contagion is to bail out institutions in distress to prevent their failure from fueling system-wide panics. Despite their political toxicity, bailouts need not be seen as a result of government naiveté or a "giveaway" to bad bank behavior. As the Diamond-Dybvig model highlights, a well-regulated and solvent bank might nonetheless suffer from a liquidity crisis that later turns into a solvency crisis (with the resulting need for a bailout). As a result, a bailout, while unpopular, may be seen as an appropriate policy directed at increasing social welfare.[112]

Given their "dirty-word" status,[113] bailouts are hard to define, as policymakers

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107. GORTON, *supra* note 87, at 137–38.

108. Demirgüç-Kunt et al., *supra* note 88, at 11.

109. Asli Demirgüç-Kunt & Enrica Detragiache, *The Determinants of Banking Crises in Developing and Developed Countries*, 45 IMF STAFF PAPERS 81, 99 (1998) (finding that "the presence of an explicit insurance scheme, although it may have reduced the incidence of self-fulfilling bank runs, appears to have worsened banking sector fragility through moral hazard"). Patricia A. McCoy, *The Moral Hazard Implications of Deposit Insurance: Theory and Evidence*, *in* 5 INTERNATIONAL MONETARY FUND, CURRENT DEVELOPMENTS IN MONETARY AND FINANCIAL LAW VOL. 5, 417, 419 (2008).

110. *See* Demirgüç-Kunt et al., *supra* note 88, at 27 fig.10.

111. For example, around ninety percent of high-income countries fund their deposit insurance schemes exclusively through private premiums. *See* Demirgüç-Kunt et al., *supra* note 88, at 26 fig.7.

112. *See* TIMOTHY F. GEITHNER, STRESS TEST: REFLECTIONS ON FINANCIAL CRISES 509 (2014) ("Herein lies the paradox. In a brutal financial crisis like ours, actions that seem reasonable—letting banks fail, forcing their creditors to absorb losses, balancing government budgets, avoiding moral hazard—only make the crisis worse. . . . [T]he actions necessary to ease the crisis seem inexplicable and unfair.").

113. *See* Bobby Allyn, *The White House Is Avoiding One Word When It Comes to Silicon Valley Bank: Bailout*, NPR (Mar. 13, 2023), https://www.npr.org/2023/03/13/1163180140/silicon-valley-

are loathe to categorize any action as a bailout.[114] In current scholarship, bailouts are defined as *ex post* funds provided to an institution, generally on an ad hoc basis (i.e., not pursuant to an existing regulatory scheme) to prevent the institution's collapse.[115] Bailouts might have strings attached—such as the government's acquisition of property in exchange for the bailout[116] or the recognition of losses by the company's debtholders (other than depositors).[117] But, generally, bailouts provide needy firms with extra liquidity so that they can honor withdrawal requests (or similar transactions) and avoid bankruptcy, which would have contagion effects on other firms.

Several features of bailouts stand out. First, they are generally *ex post* measures. That is, they are reactive, not prophylactic—although they are meant to prevent contagion. Second, they are generally provided to single institutions, not to the

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bank-is-it-a-bailout-barofsky [perma.cc/85GR-5WUP]. These sentiments are evident in the statutory scheme as well. *See* Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010) (codified as amended in 12 U.S.C. §§ 5301–5641) (stating that one of the goals of the Act was to "to protect the American taxpayer by ending bailouts").

114. See Eric Posner & Anthony Casey, *A Framework for Bailout Regulation*, 91 NOTRE DAME L. REV. 479, 480 (2015).

115. Posner and Casey provide a similar definition. *See id.* at 481. An exact definition is not too important for our purposes. The main features of bailouts that will preoccupy us are that (i) bailouts are ex-post remedies; (ii) bailouts are provided to single institutions; (iii) bailouts are provided from public funds; and (iv) bailouts are provided on an ad hoc basis (including pursuant to a statutory exception or an emergency powers provision), therefore being subject to political decision-making (and political pressure); and (v) bailouts sometimes have strings attached.

116. During the panic that led to the Great Recession, the U.S. government bailed out the American International Group (AIG). The government provided much-needed funds to AIG, yet in return it acquired significant equity stakes in the company. The government would later go on to sell these equity stakes, netting a gain. Such schemes are not uncontroversial. AIG's CEO and largest shareholder, Greenberg, sued the government arguing that the equity acquisition feature of the bailout constituted a taking without due compensation. The Court of Federal Claims agreed with Greenberg, yet concluded, in a somewhat head-scratching fashion, that Mr. Greenberg had no remedy, as the AIG equity that Mr. Greenberg sued for would have been worthless but for the federal government's intervention. The Federal Circuit later reversed Mr. Greenberg's pyrrhic victory. For a quick summary of the story, see Liz Moyer, *Maurice Greenberg Loses Bid for Damages from A.I.G. Bailout*, N.Y. TIMES (May 9, 2017), https://www.nytimes.com/2017/05/09/business/dealbook/aig-bailout-maurice-greenberg.html [web.archive.org/web/20230315222507/https://www.nytimes.com/2017/05/09/business/dealbook/aig-bailout-maurice-greenberg.html].

117. *See* Federal Reserve Act, § 13(3)(A) (establishing that any discount lending program must be one of "broad-based eligibility"). During the March 2023 banking panic, the United States used a systemic risk exception to guarantee all deposits (including deposits in excess of the FDIC limit guarantee of $250,000) of failed banks like Signature Bank, in effect "bailing out" the uninsured depositors. However, the Federal Reserve clarified that while depositors will be protected, "[s]hareholders and certain unsecured debtholders will not be protected. Senior management has also been removed." Press Release, Fed. Rsrv., Joint Statement by Treasury, Federal Reserve, and FDIC (Mar. 12, 2023), https://www.federalreserve.gov/newsevents/pressreleases/monetary20230312b.htm [perma.cc/V689-9FXL]; FDIC, ANNUAL REPORT 2023, *supra* note 99. *See also* Greg Feldberg and Carey Mott, *The 2023 Banking Crisis: Lessons About Bail-In*, YALE SCH. MGMT. (July 6, 2023), https://som.yale.edu/story/2023/2023-banking-crisis-lessons-about-bail [perma.cc/DJ9T-GD9K] ("The FDIC forced losses on the bondholders and shareholders of these three banks, where it may once have protected them in a 'systemic risk exception' (SRE) event. Perhaps more interesting is that the FDIC performed these bail-ins both under an SRE designation (SVB and Signature) and not (First Republic).").

market as a whole.[118] Third, they are generally authorized and enacted through discretionary or ad hoc procedures. Some of them might be justified through statutory means (especially after Dodd-Frank),[119] yet their implementation still involves discretionary action, such as the declaration of a systemic emergency or the use of emergency powers.[120] (As we will see, this technical distinction is important because it makes bailouts subject to political pressures and political responsibility.) Fourth, bailouts involve transfers of value from the public (i.e., taxpayers) to private actors (e.g., banks and their shareholders or debtholders). Fifth, bailouts (increasingly) have strings attached for the institutions bailed out.

3. Lender of Last Resort

A third policy available in regulators' toolkit is the use of "Lender of Last Resort" (or LOLR) schemes.[121] These include both permanent schemes, such as the Federal Reserve's discount window,[122] and temporary funding facilities, such as the Bank Term Funding Program (implemented to provide liquidity during the March 2023 banking panic)[123] and the Term Auction Facility (implemented during the 2008 Financial Crisis).[124]

Generally, LOLR schemes work to provide additional liquidity to banks in times of stress so that they can honor their commitments, such as honoring deposit withdrawals.[125] Regulators can provide emergency liquidity in a variety of ways,

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118. Since Dodd-Frank, the Federal Reserve is not allowed to lend to "any person." It must instead make any credit facility or program of "broad-based eligibility," meaning that no institution can be singled for a bailout, at least without further Congressional approval or with a declaration of an "emergency exception." *See* Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376, 2113 (2010); Eric A. Posner, *What Legal Authority Does the Fed Need During a Financial Crisis?*, 101 MINN. L. REV. 1529, 1575–78 (2017) (criticizing the narrowing of the Federal Reserve's powers).

119. *See* Posner, *supra* note 118, at 1575–78 (2017) (discussing Dodd Frank's narrowing of agencies' powers to bail out an institution).

120. *See, e.g.*, Martin J. Gruenberg Chairman, Chairman of the Federal Deposit Insurance Corporation, Recent Bank Failures and the Federal Regulatory Response, Address to the Committee on Banking, Housing, and Urban Affairs of the United States Senate 1-2 (Mar. 28, 2023), https://www.banking.senate.gov/imo/media/doc/Gruenberg%20Testimony%203-28-23.pdf [perma.cc/N2PP-X489] (declaring an emergency exception to bail out the uninsured depositors of Signature Bank).

121. *See generally* WALTER BAGEHOT, LOMBARD STREET (1873) (providing the seminal classical discussion of lender of last resort schemes); Stanley Fischer, *On the Need for an International Lender of Last Resort*, 13 J. ECON. PERSPECTIVES 85, 86–92 (1999) (summarizing modern thinking on the features of LOLR schemes).

122. *See* 12 U.S.C. § 347b (2024); *Discount Window Lending,* FED. RSRV. (2024), https://www.federalreserve.gov/regreform/discount-window.htm [perma.cc/PUD4-5MBD].

123. *See Federal Reserve Board Announces It Will Make Available Additional Funding to Eligible Depository Institutions to Help Assure Banks Have the Ability to Meet the Needs of All Their Depositors*, FED. RSRV. (Mar. 12, 2023), https://www.federalreserve.gov/newsevents/pressreleases/monetary20230312a.htm [perma.cc/ZUU7-GG9N] (announcing the program).

124. *See Federal Reserve and Other Central Banks Announce Measures Designed to Address Elevated Pressures in Short-Term Funding Markets,* FED. RSRV. (Dec. 12, 2007), https://www.federalreserve.gov/newsevents/pressreleases/monetary20071212a.htm [web.archive.org/web/20260124210343/https://www.federalreserve.gov/newsevents/pressreleases/monetary20071212a.htm] (announcing the program).

125. Janet Yellen, Secretary, Treasury Dep't, Remarks at the American Bankers Association's

from long-term lending to short-term collateralized lending,[126] to asset purchases at prices higher than open market prices.[127] In this way, the LOLR schemes stop runs by allowing banks to honor their deposit requests and by preventing a bank's liquidity crisis from becoming a solvency crisis through fire sales of the bank's other assets.

Perhaps more importantly, credible and well-publicized LOLR schemes should reduce incentives for runs *ex ante*. In our simplified Diamond-Dybvig model described above, the depositors would not need to preemptively run on a bank to avoid being the last in line, as emergency liquidity would ensure that the bank is able to meet its obligations (at least as long as the bank is able to qualify for such emergency liquidity).

As such, LOLR schemes are functionally quite similar to public insurance, given their aim to prevent runs by changing depositor incentives. That being said, LOLR schemes are different from public insurance schemes in two main ways. First, they differ in timing: LOLR policies provide liquidity to the bank to meet its obligations *prior* to there being a bank failure. Second, they differ in their incidence (i.e., the source of the emergency liquidity funds). In the United States, public insurance of banks is supposed to be funded through insurance premiums paid by covered banks, while funds used in LOLR schemes are public funds.

LOLR schemes are also quite functionally similar to bailouts, in that emergency liquidity (from public funds) is provided to banks in dire need and that some LOLR schemes are created on an ad hoc basis in response to an evolving crisis.[128] However, unlike bailouts, LOLR schemes tend to be available broadly to all interested banks, not to a select few.[129] More importantly, insofar as LOLR schemes are less subject to discretion than bailouts, they are a quicker and more credible instrument to provide emergency liquidity. Lending from the discount

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Washington DC Summit (Mar. 21, 2023), https://home.treasury.gov/news/press-releases/jy1354 [perma.cc/TD3J-C2U9] (quoting Janet Yellen, Secretary of the Treasury) ("The Fed's new lending facility—the Bank Term Funding Program—is designed to help banks meet the needs of all of their depositors.").

126. *See Bank Term Funding Program Terms and Conditions*, FED. RSRV. (Jan. 24, 2024), https://www.federalreserve.gov/newsevents/pressreleases/files/monetary20240124a1.pdf [perma.cc/TZX2-7LQS] (providing loans for up to a year collateralized by assets eligible for open-market Federal Reserve purchases, such as Treasury bonds).

127. BEN S. BERNANKE, 21ST CENTURY MONETARY POLICY: THE FEDERAL RESERVE FROM THE GREAT INFLATION TO COVID-19, at 312 (2022). The Federal Reserve can only buy Treasuries, government-guaranteed securities, and GSE-issued MBS. In order to buy other kinds of assets, it would need to invoke 13(3) powers. This has happened in the past: The Federal Reserve bought commercial paper in the Great Recession and corporate bonds, municipal bonds, and bank loans in 2020. *Id.* at 332. Bernanke notes, however, that "the Fed's purchases of alternative assets in those two episodes were comparatively quite modest in size, were aimed at preventing breakdowns in specific credit markets, and were kept legally and conceptually separate from QE and monetary policy." In addition, these purchases were also Congressionally approved in the CARES Act. *Id.*

128. For example, the Bank Term Funding Program was implemented pursuant to the Federal Reserve's 13(3) powers.

129. *See Bank Term Funding Program Terms and Conditions*, *supra* note 126 (discussing collateral requirements and not limiting eligibility based on solvency).

window, for example, is broadly available and does not require policymaker intervention or specially delegated authority.[130] (But other temporal schemes have been specifically enacted to react to a crisis pursuant to the Federal Reserve's 13(3) emergency powers.)[131]

A key (and much debated) aspect of LOLR schemes is the stigma associated with borrowing from them. That is, borrowing from the government might be seen as a negative signal by the bank's counterparties, interpreting it as a signal of the bank's impending collapse, thus fueling a preemptive run by depositors. A large bank CEO put it succinctly: "Even the oft-used label 'the lender of last resort' conveys desperation. . . . The day you hit it for anything other than a test you effectively have told the world you failed."[132]

4. Suspension of Convertibility

Another historically common way to stop bank runs is to give the bank victim to a run a "break."[133] That can be done straightforwardly by suspending the convertibility of deposits, and it works quite intuitively. If a *solvent* bank has a liquidity problem caused by a run, then more time should allow (i) the bank to convert its assets into cash so as to honor its depositors' requests, (ii) the depositors to calm down if the bank run was caused by an exogenous shock,[134] and (iii) regulators to find ways to effectively respond to the bank run. In a traditional Diamond-Dybvig model, a suspension of convertibility might not only work as a response to runs but might also work to prevent runs, if depositors know that a solvent bank will be able to prevent a liquidity crisis by suspending convertibility. In that case, depositors' concerns about a liquidity crisis will be alleviated and they will not have an incentive to engage in a preemptive run on the bank.[135]

These suspensions have taken many forms, with some dating back to the eighteenth century. Lore has it that in 1720, the Bank of England defended itself from a bank run by organizing friends of the bank in front of the line of running depositors. The Bank then paid its friendly "depositors" slowly in sixpence coins, with its friendly

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130. *See generally* 12 C.F.R. § 201 (2024) (containing Regulation A, which sets forth the structure of the discount window lending program).

131. *See* BERNANKE, *supra* note 127, at 332 (discussing the 2020 invocation of emergency powers).

132. David Wessel, *How to Fix What Ails the Fed's Discount Window*, BROOKINGS (Mar. 12, 2024), https://www.brookings.edu/articles/how-to-fix-what-ails-the-feds-discount-window/ [perma.cc/9LLF-Q5L3] (quoting William Demchak, CEO of PNC Financial Services Group).

133. Diamond & Dybvig, *supra* note 67, at 410–13 (discussing how suspension of convertibility can efficiently stop runs only in limited circumstances (i.e., when the Bank knows what the normal amount of withdrawals is, and such an amount is not stochastic), but how even with imperfect information, "suspension can generally improve on the uninsured demand deposit contract by preventing runs").

134. *See, e.g.*, CHARLES P. KINDLEBERGER & ROBERT Z. ALIBER, MANIAS, PANICS, AND CRASHES: A HISTORY OF FINANCIAL CRISES 210–11 (5th ed. 2005).

135. Diamond & Dybvig, *supra* note 67, at 410–13; Gorton, *supra* note 71. The reality, however, is more complicated, with some arguing that badly timed or badly coordinated breakers might actually incentivize runs.

depositors returning the coins to the bank through another door. And so on. The technique bought the bank several days and ensured that it remained open.[136]

The technique evolved into bank holidays, which were a common way to prevent runs until the emergence of public insurance. Even in the early twentieth century, bank holidays were a common way for the government to buy time for banks in distress.[137] (In fact, one of the main causes of the bank failures of the 1930s was that banks were forced into fire sales of their assets by bank runs.)[138]

Although bank holidays are no longer a common way to stop runs,[139] this approach has not been completely abandoned. Market breakers are a frequent way to halt instability and runs in the public equity markets, for example.[140] Moreover, as more and more "banks" emerge out of banking law's perimeter, scholars have sought to reimagine suspension of convertibility in new contexts. As one of us has argued, courts could serve to enforce suspension of convertibility for issuers of digital assets when other policy tools are unavailable and when doing so is of systemic importance.[141]

II. EVALUATION OF TRADITIONAL INSTRUMENTS IN A WORLD OF RFTS

Our examination above has shown that traditional instruments for regulating financial contagion have various shortcomings but have, nonetheless, frequently proved effective in achieving their ultimate regulatory goal in the context of traditional banks. In this part, we argue that this menu of instruments is likely insufficient to effectively eliminate the financial contagion risk of RFTs. We think bailouts, LOLR schemes, and suspensions can be dismissed relatively quickly and discuss them first. Public insurance has more merit, but we argue this instrument will also be inadequate. Lastly, we examine potential private solutions and discuss how they do not seem well suited to address financial contagion risk.

A. Bailouts, LOLR Schemes, and Suspension Not Full Solutions

Although attractive in some contexts, in the context of RFTs, bailouts, LOLR schemes, and suspensions do not present complete or particularly desirable solutions to the problem of bank runs and financial contagion. These measures (1)

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136. KINDLEBERGER & ALIBER, *supra* note 134, at 210.

137. *See* FRIEDMAN & SCHWARTZ, *supra* note 76, at 161 n.43, 163, 164–68.

138. *See* FRIEDMAN & SCHWARTZ, *supra* note 76, at 355–56 (discussing how bank failures in the late '20s and early '30s were caused primarily by a deterioration of banks' balance sheets due to the plummeting value of the bonds they held—such decreases in value themselves caused by "fire sales" of those bonds by distressed banks).

139. For example, despite the unprecedented speed of deposit withdrawals in the March 2023 banking crisis, neither Silicon Valley Bank nor First Republic Bank suspended deposit withdrawals. *See, e.g.*, FDIC, FDIC'S SUPERVISION OF FIRST REPUBLIC BANK 19–21 (2023), https://www.fdic.gov/sites/default/files/2024-03/pr23073a.pdf [perma.cc/4YPX-CT8M] (discussing First Republic's crisis); MICHAEL S. BARR, REVIEW OF THE FEDERAL RESERVE'S SUPERVISION AND REGULATION OF SILICON VALLEY BANK 22–24 (2023), https://www.federalreserve.gov/publications/files/svb-review-20230428.pdf [perma.cc/DB89-92KG]. *See also* Choi, *supra* note 83 (summarizing key events).

140. *See* 17 C.F.R. § 240.6h-1 (2021) (discussing circuit breakers).

141. *See* Calderón Gómez, *supra* note 7.

are vulnerable to political decision-making, critically making their implementation both unlikely and slow; (2) present heightened moral hazard problems in the context of RFTs; and (3) pose unique implementation challenges.

First, some of these are vulnerable to a degree of political decision-making,[142] making these tools less credible as a liquidity measure to prevent runs *ex ante* and more prone to critical implementation delays, which both increase the risk of financial contagion and its costs. These concerns are especially salient in the context of RFTs, where issuers are usually incorporated into lightly regulated foreign jurisdictions and for whom political support is not assured.

Second, all of these measures suffer from increased moral hazard problems, given the context in which typical RFT issuers operate.[143] As the recent collapses of firms operating in the crypto space (e.g., FTX and Celsius) illustrate, firms operating in current environments where RFTs are issued and exchanged tend to be (i) aggressively risk-taking, (ii) avoidant of and resistant to regulation, and (iii) lacking in transparency to investors, depositors, and regulators. All of these increase the problem of moral hazard because (i) increased risk-taking can feed into more market concentration and increase the likelihood and significance of financial contagion;[144] (ii) direct banking regulation, which is practically unavailable here, is necessary to stop banks from shifting their risk to the government through deposit insurance;[145] and (iii) credible and comprehensive information is necessary for private (e.g., token holder or counterparty) monitoring of operations, a key disciplining force.[146] These increased moral hazard problems can not only make these policies less effective in reducing runs and ensuring financial stability,[147] but can actually result in *net* increases of financial instability, as evidenced by international experience.[148]

Third, each of these policy options suffers from unique drawbacks that make their use unlikely or inadvisable in the context of systemic instability caused by a run on RFTs. In the context of RFTs, discrete bailouts are unlikely to work well,

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142. GEITHNER, *supra* note 112, at 509 (recounting policymakers' political dilemma in responding to financial crises); Posner, *supra* note 118, at 1555 (arguing that political considerations stopped Hank Paulson, Secretary of the Treasury at the time, from responding effectively to Lehman Brothers' collapse). *See generally* SARAH BINDER & MARK SPINDEL, THE MYTH OF INDEPENDENCE: HOW CONGRESS GOVERNS THE FEDERAL RESERVE (2017) (discussing the political limitations on the Federal Reserve).

143. *See* Fischer, *supra* note 121, at 92–94 (discussing the acute moral hazard issues with an LOLR scheme).

144. Levent Altinoglu & Joseph E. Stiglitz*, Collective Moral Hazard and the Interbank Market*, 15 AM. ECON. J.: MACROECONOMICS 35 (2023).

145. *See* Douglas Diamond & Phillip Dybvig, *Banking Theory, Deposit Insurance, and Bank Regulation*, 59 J. BUS. 55, 59 (1986) [hereinafter *Banking Theory*] ("If there were no regulation, much of the risk in the entire economy would be transferred to the government via deposit insurance.").

146. *See* McCoy, *supra* note 109, at 432.

147. *See* Asli Demirgüç-Kunt & Enrica Detragiache, *Does Deposit Insurance Increase Banking System Stability? An Empirical Investigation* 25 (IMF, Working Paper WP/00/3, 2000), https://www.imf.org/en/Publications/WP/Issues/2016/12/30/Does-Deposit-Insurance-Increase-Banking-System-Stability-3382 [perma.cc/MG4U-JLSK].

148. *See* Aslı Asli Demirgüç-Kunt & Edward J. Kane, *Deposit Insurance Around the Globe: Where Does It Work?*, 16 J. ECON. PERSPECTIVES 175 (2002).

given the high interconnectedness of issuers and other market participants employing RFTs, such as RFT exchanges.[149] Moreover, especially after the Great Recession's bailouts and Dodd-Frank, regulators are seen as needing strong legal authorization for bailouts. A bailout of an RFT issuer, such as Tether, would likely lack any plausible legal authorization under current law.[150] For their part, LOLR schemes are similarly an inadequate solution. There is no regulatory framework that would plainly allow for an injection of extra liquidity to RFT issuers or exchanges, for example. Creating new government lending facilities is possible, yet it is also unlikely given current legal frameworks, which allow the Federal Reserve to exclusively lend to certain institutions and to only receive certain kinds of high-value collateral, though bureaucrats and politicians alike might not be politically inclined to support risky issuers with public funds.[151] Suspension is unlikely to fully work. It would need to be part of a coordinated government effort to suspend the redeemability of coins, an unlikely and difficult solution to implement.[152]

B. Public Deposit Insurance is Not an Adequate Solution

Would public insurance work to reduce the financial contagion problem posed by RFTs? We will set aside the political economy question of passage and implementation for now, a key question given that these measures to insure RFT issuers might be perceived by the public as another toxic bailout.[153] As we have seen, public deposit insurance is no panacea, and its design is key to its effectiveness.[154] Warning against a Pollyannaish view of public insurance, researchers have argued that "[p]olicymakers should view the positive correlation between poorly designed deposit insurance and banking crises as a wakeup call" and realize that these schemes do not work in every context.[155]

Policymakers and scholars generally agree that public deposit insurance must have several key design features to succeed. First, the public deposit insurance must seek to cover all "banks," so as to avoid problems of adverse selection (i.e., only unhealthy banks will seek to join the insurance pool).[156] Relatedly, it must prevent

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149. As such, broader (i.e., both more expensive to the taxpayer and politically costly) bailouts might be required.

150. *See* Calderón Gómez, *supra* note 7, at 645–47 (discussing the inadequacy of response mechanisms to a run on stablecoin).

151. *Id.*

152. *See infra* note 187.

153. Policymakers' responses to the 2023 banking crises were quickly perceived as a toxic bailout, a perception against which the Biden administration fought. *See* Joey Garrison, *Is It A Bank Bailout? On SVB, White House Fights Comparisons To 2008 As Biden Confronts Bank Crisis*, USA TODAY (Mar. 15, 2023), https://www.usatoday.com/story/news/politics/2023/03/15/president-biden-fights-bailout-comparisons-2008-amid-bank-crisis/11477422002/ [perma.cc/2WBC-RJKK].

154. *See supra* Section I.D.1; GORTON, *supra* note 79, at 27 ("Whether a deposit system will succeed or not depends on the details of the design.").

155. *See* Asli Demirgüç-Kunt & Edward J. Kane, *Deposit Insurance Around the Globe: Where Does It Work?*, 16 J. ECON. PERSPECTIVES 175, 186 (2002).

156. *See* FIN. STABILITY FORUM, GUIDANCE FOR DEVELOPING EFFECTIVE DEPOSIT INSURANCE SYSTEMS 21 (2001), https://www.fdic.gov/deposit/deposits/international/guidance/finalreport.pdf [perma.cc/CLE2-WR8H] [hereinafter *FSB Report on Effective Deposit Insurance*]; Kevin

entrance to the scheme to institutions that do not comply with some minimum risk requirements.[157] Second, the public deposit insurance mechanism must regulate the rates that insured institutions can offer. This is meant to control the moral hazard problem and prevent banks from competing over deposits by offering very high interest rates, knowing that if they fail, any losses will be borne by the scheme.[158] Third, the system must be coupled with some degree of public and private supervision or examination to alleviate problems of moral hazard.[159] A key element of effective monitoring or supervision is the availability of credible information about the institution's financial health.[160] Fourth, the imposition of risk-adjusted insurance premiums has been hailed as a feature that can significantly alleviate moral hazard problems.[161] Implementing these is dependent on institutional competence and capacity and the availability of information about institutions' riskiness (the availability of which is itself dependent on adequate supervision and monitoring of member institutions).[162]

These essential features, however, cannot be easily replicated for a "public insurance" model for RFTs. That is because these features critically depend on (i) some effective assertion of jurisdiction by the United States and effective imposition of regulations (e.g., capital reserve standards) over the regulated entities,[163] (ii) voluntary cooperation from the regulated entities, and (iii) comprehensive and credible information on the financial health of the regulated entities.[164] All of these are unlikely to happen in the context of RFTs—even with the partial folding in of some new

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Davis, REPORT TO THE AUSTRALIAN TREASURY: STUDY OF FINANCIAL SYSTEM GUARANTEES 75 (2004) https://treasury.gov.au/sites/default/files/2020-01/study-of-fsg-p2003-45061.pdf [web.archive.org/web/20240819021242/https://treasury.gov.au/sites/default/files/2020-01/study-of-fsg-p2003-45061.pdf]; Demirgüç-Kunt et al., *supra* note 147, at 18.

157. *See FSB Report on Effective Deposit Insurance*, *supra* note 156, at 22; GORTON, *supra* note 87, at 27.

158. GORTON, *supra* note 87, at 27; Demirgüç-Kunt & Detragiache, *supra* note 147, at 18.

159. *See* Demirgüç-Kunt & Kane, *supra* note 155, at 192–93; Demirgüç-Kunt & Detragiache, *supra* note 147, at 19; *FSB Report on Effective Deposit Insurance*, *supra* note 156, at 14.

By reducing the negative payoffs from bank failure to depositors, deposit insurance reduces private monitoring and supervision of banks. *See* McCoy, *supra* note 109, at 423; Jonathan R. Macey & Geoffrey P. Miller, *Bank Failures, Risk Monitoring, and the Market for Bank Control*, 88 COLUM. L. REV. 1153, 1165 (1988). As such, public monitoring (and incentivizing private monitoring through insurance caps or other mechanisms) is essential to the success of the enterprise. Several reforms can achieve that objective, ranging from limits on the amount of deposits insured to reforms of banking rules to allow for easier bank acquisitions. *See* Demirgüç-Kunt & Kane, *supra* note 155, at 192 (proposing the former); Macey & Miller, *supra*, at 1202–25 (proposing the latter).

160. *See* GORTON, *supra* note 87, at 27; Demirgüç-Kunt & Detragiache, *supra* note 147, at 15 n.16.

161. *See* Demirgüç-Kunt & Detragiache, *supra* note 147, at 15 n.16.

162. *See FSB Report on Effective Deposit Insurance*, *supra* note 156, at 14–15, 29; Diamond & Dybvig, *Banking Theory*, *supra* note 145, at 61; GORTON, *supra* note 87, at 27.

163. As we have discussed, MiCAR evidences the real limits that there are to effective regulation of cryptoassets. *See supra* note 6.

164. *See generally* FIN. STABILITY BD. & INT'L MONETARY FUND, IMF-FSB SYNTHESIS PAPER: POLICIES FOR CRYPTO-ASSETS 20–22 [hereinafter *FSB/IMF Report on Crypto*] (highlighting these high-level principles for the regulation of crypto assets), https://www.fsb.org/wp-content/uploads/R070923-1.pdf [web.archive.org/web/20240826020352/https://www.fsb.org/wp-content/uploads/R070923-1.pdf].

types of money like stablecoin into the traditional banking regulatory perimeter.[165]

First, U.S. regulators currently lack sufficient means to compel all RFT issuers into joining a public insurance scheme. Regulators would have to stretch current law[166] or enact new statutes (possibly designating RFT issuers as "banks")[167] to bring some RFT issuers, such as stablecoin issuers, into the fold. But, even with these proposals, it is unlikely that RFT activity would actually fold into the U.S. regulatory perimeter, especially if these proposals impose significant *net* costs on the issuers. After all, RFT issuers could "leave" to friendlier jurisdictions[168] and argue that they are not subject to U.S. jurisdiction because they are not incorporated in the United States nor sell tokens to U.S. persons.[169] That is what has happened in the EU, where attempts to regulate stablecoin have resulted in issuers formally leaving the jurisdiction rather than complying.[170] But as China's failed experiment with banning cryptocurrencies evidences, interested depositors in the United States (or the EU) could still access and buy RFTs easily with widely available tools like virtual private networks.[171] The United States' efforts to regulate these offshore entities would not only face extraterritoriality problems[172] and possible international pushback, but might also push trading activity even further from the U.S. regulatory sphere—a sphere in which some new money instruments (e.g., stablecoins) now legitimately occupy. As such, the compulsory inclusion of mobile RFT issuers within the regulatory (and deposit insurance) spheres would be likely ineffective, and possibly counterproductive.

Not all RFT issuers would be mobile, however; think about Amazon (and its

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165. *See supra* note 19.

166. Gorton & Zhang, *supra* note 7, at 951–55 (discussing the Financial Stability Oversight Council (FSOC) declaration of stablecoins as a systemic "payment activity" under Title VIII of the Dodd Frank Act, authorizing the Federal Reserve to regulate). Current frameworks clarify that stablecoins are not covered under the FDIC. *See* GENIUS Act § 4(e).

167. *Cf.* RICKS, *supra* note 39, at 234–43 (2016) (proposing a ban of money creation by entities not within the banking regulatory perimeter). *See* Lev Menand & Morgan Ricks, *Rebuilding Banking Law: Banks as Public Utilities*, 41 YALE J. REG. 591, 640–45 (2024).

168. *See* John C. Coffee Jr., *Extraterritorial Financial Regulation: Why E.T. Can't Come Home,* 99 CORNELL L. REV. 1259, 1269–70 (2014) (discussing financial regulation as a tragedy of the commons, where some nations wish to free-ride on regulation promoting financial stability by some nations, but refuse to adopt it themselves to avoid the costs of regulation).

169. A recent case holding U.S. securities law applicable to the sale of cryptocurrencies by Binance highlighted the lack of clarity over Binance's location. Williams v. Binance, 96 F.4th 129, 138 (2d Cir. 2024). The existence of another regulatory nexus would thus presumably make these regulations extraterritorial and inapplicable. *See* David Livshiz et al., *Second Circuit: Crypto Exchange Binance Subject to U.S. Securities Laws to Avoid a Regulatory Vacuum*, FRESHFIELDS (May 30, 2024), https://blog.freshfields.us/post/102j8uc/second-circuit-crypto-exchange-binance-subject-to-u-s-securities-laws-to-avoid [perma.cc/7XEY-MFA7].

170. *See supra* note 6.

171. *See, e.g.*, Conghui Chen & Lanlan Liu*, How Effective Is China's Cryptocurrency Trading Ban?*, FIN. RES. LETTERS, May 2022, at 1; Zheping Huang et al., *Chinese Users of the Binance and FTX Exchanges Show Holes in Beijing's Crypto Ban*, BLOOMBERG (May 7, 2023), https://www.bloomberg.com/news/articles/2023-05-07/chinese-users-of-the-binance-ftx-exchanges-show-holes-in-beijing-s-crypto-ban [perma.cc/5747-CN5E].

172. *Cf.* Coffee Jr., *supra* note 168, at 1297.

issuance of Bezos) in our previous example.[173] Although these RFT issuers are unlikely to leave given the nature of their operations, including them as a traditional "bank" within our banking regulatory perimeter would extend banking's limits beyond recognition: Amazon's business might share important functional vulnerabilities with banks, but its business (including its capital allocation needs) is just not the same as that of traditional banks.[174] (Such a capacious expansion would presumably bring all sorts of companies, from Starbucks to Paypal, within the banking perimeter.)[175] Some might welcome such a capacious expansion, seeking to cover every entity that arguably issues private money into the banking sphere. But such a drastic expansion of private insurance over *all* private money creation might counterintuitively increase systemic moral hazard. Such an expansion would seriously reduce the incentives for the private monitoring of firms that were previously uncovered (i.e., now that depositors are insured, they do not need to monitor their bank), depending on the degree of the insurance coverage. Moreover, it would considerably spread thin the regulator's capacity across all money creation issuers, reducing public monitoring.[176] Lastly, the capacious expansion of deposit insurance (and banking regulation) would significantly distort the economic decision-making of an expansive slice of economic actors, pushing them towards riskier asset classes[177] and potentially decreasing the financial system's stability.[178]

Second, regulators lack sufficient sticks and carrots to make *voluntary* participation in the scheme feasible and realistic. The absence of private insurance of RFTs suggests that issuers are unlikely to voluntarily accede to this scheme in the first place. The kind of transparency and government regulation and oversight that effective deposit insurance would require might counterintuitively make these assets *less* desirable for a sizable portion of RFT market participants, who generally place significant value on RFT's "decentralized" and "deregulated" nature, making issuers unlikely to play ball with U.S. regulators. After all, this preference is exactly why RFT issuers and counterparties have been incorporated and headquartered in jurisdictions

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173. *See supra* Section I.A.

174. *Cf.* Awrey, *supra* note 7, at 60 (arguing that bringing stablecoin issuers into the traditional banking regulatory perimeter lacks coherence, as they "simply do not look like banks" for purposes of banking regulation).

175. *Cf.* Awrey, *supra* note 7, at 60.

176. Moreover, the political economy of regulators' supervisory role over banks might be further eroded by the expansion of what counts as a "bank," as Lev Manand convincingly argues. *See* Lev Manand, *Why Supervise Banks? The Foundations of the American Monetary Settlement*, 74 VAND. L. REV. 101, 168–69 (2021).

177. *See, e.g.*, Edward T. Kim & Marcelo Rezende, *Deposit Insurance Premiums and Bank Risk*, 12 REV. CORP. FIN. STUD. 291, 292 (2023) ("Taken together, our findings suggest that deposit insurance premiums induce banks to search for yield.").

178. *See* Gorton & Zhang, *supra* note 7, at 953–55. For example, banking regulations (Basel Liquidity Coverage Ratio rules) requiring banks to hold a certain ratio of liquid assets have significantly distorted the banks' behavior, reducing their lending activities and pushing those activities to banks uncovered by the regulations, therefore resulting in a net neutral reform from a financial stability perspective. *See* DANIEL ROBERTS, ASANI SARKAR & OR SHACHAR, THE COSTS AND BENEFITS OF LIQUIDITY REGULATIONS 35 (2023), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr852.pdf?sc_lang=en [perma.cc/S88U-XZKN].

with a light-touch approach to regulation.[179] Moreover, now that some of these kinds of money have been legitimized by U.S. regulators (i.e., stablecoins under the GENIUS Act) there are not many carrots left for the U.S. regulators to offer these issuers in exchange for voluntary participation in a deposit insurance regime.[180]

Third, the opaque nature of their operations and the lack of credible information on the financial health of RFT issuers is a critical problem for any regulated public deposit scheme.[181] Even for now-covered instruments such as stablecoins, the regulatory regime does not ensure that financial information is credible, because stablecoin issuers are not subject to independent auditing of the information disclosed.[182] The lack of information would also doom the public insurance mechanism's monitoring and supervision and interest rate regulatory functions.

Yet perhaps U.S. regulators—against all odds—can succeed in (i) asserting jurisdiction over all RFTs, bringing them into the regulatory perimeter and into the insurance pool; (ii) getting RFTs to cooperate; *and* (iii) obtaining credible information about their financial health. That might not constitute success, as the Bezos story illustrates. If RFTs become just as safe as banking deposits (due to public insurance and proper regulation), while *also* possessing distinct advantages over traditional banking deposits and fiat money (e.g., decentralization, lower transaction costs, and any other innovations that might come), what is to stop RFTs from displacing the traditional banking system and fiat money altogether? In other words, why would I keep my money in dollars, when I can keep it in my new safe and innovative RFTs? Such displacement would be of tremendous social consequence: it would critically threaten the future of monetary policy[183] (moving control of monetary policy from a democratic government to a for-profit money issuer), critically endanger financial stability,[184] and further concentrate political and economic power.[185] As such, in the end, it might not be optimal for the State to provide federal deposit insurance to these new types of money, as that would ensure they outcompete traditional fiat currency.

Consequently, public insurance of RFTs is unlikely to be effective without major overhauls. But if, miraculously, public insurance of RFTs became feasible, it

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179. *See, e.g.*, William Chao, *Crypto Exchange's Jurisdiction-Shopping: A Regulatory Problem that Requires a Global Response*, COLUM. J. TRANSNAT'L L.: BULLETIN (Feb. 23, 2023), https://www.jtl.columbia.edu/bulletin-blog/crypto-exchanges-jurisdiction-shopping-a-regulatory-problem-that-requires-a-global-response [perma.cc/2PQL-VAEP].

180. *See supra* note 19.

181. Tether, for example, is not officially audited and statements about its financial condition have neither been detailed nor credible. *See, e.g.*, Jemima Kelly, *Tether Says Its Reserves Are Backed by Cash to the Tune of . . . 2.9%*, FIN. TIMES (May 14, 2021), https://www.ft.com/content/529eb4e6-796a-4e81-8064-5967bbe 3b4d9.

182. *See supra* note 19.

183. *See FSB/IMF Report on Crypto*, supra note 164, at 56; Gorton & Zhang, *supra* note 7, at 953–55.

184. *See FSB/IMF Report on Crypto*, supra note 164, at 10-11; Gorton & Zhang, *supra* note 7, at 953–55.

185. Saule T. Omarova & Graham S. Steele, *Banking and Antitrust*, 133 YALE L.J. 1162, 1249–52 (2024).

would also remain undesirable, as it would threaten the government's control over monetary policy and would further concentrate political and economic power in the hands of an unelected few.

C. Private Instruments Are Not an Adequate Solution

Public instruments are not the *only* possible solution to contagion risk; private instruments could possibly address contagion risk. Two private instruments come to mind, both of which closely and functionally resemble their public counterparts. First, private contractual breakers could arise as a coordinated solution to address contagion risk by halting bank runs and panics—much like the case of public suspension of convertibility. Second, private insurance mechanisms are a plausible alternative to public mechanisms, especially in contexts with suboptimal legal and institutional frameworks.

1. Contractual Breakers

Contractual breakers would work analogously to a public suspension of convertibility, aiming to temporarily suspend the convertibility of deposits (or RFTs). That is, parties could, through private contracting, provide that an issuer has the right to suspend the convertibility of deposits (or RFTs) in times of crisis. This is not a theoretical possibility, but rather a practical reality, with several prominent RFTs contractually allowing (at least purportedly) an issuer to suspend its RFT's convertibility. Tether, for example, contemplates a suspension in the convertibility of its tokens as a result of "illiquidity or unavailability or loss of any Reserves."[186]

That being said, the lack of governmental support makes private breakers less effective than public suspension—without any redeeming advantages. First, depending on the context, a declaration by a single bank (or RFT issuer) that it will not redeem deposits might fuel rather than stop a run, leading depositors to withdraw as soon as possible.[187] That is because unlike a market-wide shutdown or a broad suspension, the signal is firm specific, which has in the past made investors and counterparties consider private breakers as a negative signal. In the same way that borrowing from the discount window is seen as a worrisome signal, a party's suspension of deposits is a negative market signal that increases, rather than decreases, market pressure on the RFT issuer. Generally, governmental assistance is key in establishing the credibility of the issuer and making sure that the suspension does

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186. Tether, currently the largest stablecoin, has such a provision in its terms of service.

> Tether reserves the right to delay the redemption or withdrawal of Tether Tokens if such delay is necessitated by the illiquidity or unavailability or loss of any Reserves held by Tether to back the Tether Tokens, and Tether reserves the right to redeem Tether Tokens by in-kind redemptions of securities and other assets held in the Reserves. Tether makes no representations or warranties about whether Tether Tokens that may be traded on the Site may be traded on the Site at any point in the future, if at all.

Terms of Service, TETHER (Dec. 7, 2023), https://tether.to/en/legal/ [perma.cc/6EMM-2HFT].

187. However, a suspension of convertibility that communicates the solvency of the bank could instead provide more confidence in the bank and stop a run. *See* Gorton, *supra* note 71.

not become a negative market signal that further fuels a run.[188] As a result, even when breakers are contractually provided, a considerable degree of public cooperation is needed for the breakers to be as *practically* effective as their public counterparts.

Second, a single-issuer suspension would be likely be *legally* ineffective without the assistance of a government. As a preliminary matter, it is not clear what legal authority RFT issuers might have to actually suspend convertibility by themselves.[189] RFT issuers like Tether may provide for such suspensions in their terms of use, but such terms might not be broadly enforceable. For example, a court might refuse to enforce those terms or render them moot against certain claimants as a contract law or banking law matter. Alternatively, a zealous regulator might pressure the issuer to redeem token holders, even if the regulator's jurisdiction over the conversion is questionable.[190] Further, in order for breakers to work, they must generally be coordinated to apply to different kinds of claimants. The contractual suspension of convertibility would only apply to the issuance of tokens, yet issuers in distress have other counterparties who might quickly seek full payments of any claims against the issuer. Such a barrage of claims would further complicate the issuer's liquidity situation and ultimately render the breaker ineffective. As such, breakers are neither a practical nor desirable private solution.

2. Private Insurance Mechanisms

A skeptic might ask: why the focus on *public* insurance, since private insurance is plausible? In fact, critics of public deposit insurance usually hail private insurance not only as a plausible, but as a superior, alternative. They contend that the costs to the fisc of maintaining an insurance fund are too great and that the government is not an effective insurer. They criticize public insurance for (i) its moral hazard problems, (ii) its "excessive" government entanglement into the way banks run, and (iii) its potential to favor "too big to fail" banks.[191]

Private alternatives could take many forms. For example, groups of banks could form syndicates to provide cross guarantees on a joint and severally liable basis for deposits held at any of the syndicate's members.[192] Others suggest that banks should

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188. *See* Adam Samson et al., *Bitcoin Tumbles as Crypto Lender Celsius Halts Withdrawals*, FIN. TIMES (Jun. 14, 2022), https://www.ft.com/content/25ac1667-9f50-4fl6-b553-448ea4582613 [perma.cc/5MRC-KKPN].

189. *But see* Calderón Gómez, *supra* note 7.

190. *But see supra* note 6. It is plausible that EU regulators would step in and threaten legal action against RFT issuers (and their workers) to enforce the convertibility of their citizens' deposits—regardless of whether the RFT issuer actually falls under the EU's regulatory umbrella.

191. *See, e.g.*, Christine Bradley et al., *Privatizing Deposit Insurance: Results of the 2006 FDIC Study*, 1 FDIC Q. 23, 23–25 (2007), https://www.fdic.gov/analysis/quarterly-banking-profile/fdic-quarterly/2007-vol1-2/privatizing-deposit-insurance.pdf [perma.cc/7AB4-GL3G] (summarizing criticisms of public deposit insurance in the United States).

192. The proposal was introduced in Congress in 1999. *See id.* at 25 n.5. For a description of what the proposal would look like and a discussion of its historical precedents, see Bert Ely, *Regulatory Moral Hazard: The Real Moral Hazard in Federal Deposit Insurance*, 4 INDEP. REV. 241 (1999) (discussing the syndicate approach based on the antebellum private deposit insurance mechanisms in Indiana, Ohio, and Iowa). Ely's account has been rightly criticized as taking a myopic and excessively

just "take over" the management and ownership of the FDIC.[193] Alternatively, others argue for the substitution of the FDIC with a private insurance company.[194]

These private alternatives arguably do not solve the problems that they identify with public insurance. Moral hazard problems are inherent in the business of insurance and do not simply disappear with the privatization of insurance. More specifically, however, reforms to the FDIC premium pricing (so that the premiums are not flat but rather based on the bank's "riskiness") should have significantly reduced the moral hazard problem—at least to the extent most privatization reforms would through risk-based pricing.[195] Moreover, the existing banking regulatory framework is not premised on the existence of a public insurance mechanism and has distinct justifications for its existence, so privatization of insurance is unlikely to change how banks run in practice.[196] Lastly, the "favor" given to big banks is unlikely to change with a privatization model, with evidence suggesting that privatization actually leads to concentration.[197]

Evidence on the effectiveness of private insurance mechanisms is at best mixed.[198] Unlike publicly mandated insurance mechanisms, private mechanisms might suffer from adverse selection problems (i.e., only risky banks might get insurance).[199] Privately managed systems have also suffered from principal-agent problems, with management's relationships to member banks compromising its

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rosy view of these historical precedents and ignoring important idiosyncratic elements of these banking systems.

> We can conclude, however, that if a state creates a monopoly or near-monopoly banking system with banks that make very few loans, take virtually no risks, become heavily involved in political maneuvering, concoct intricate means of avoiding accountability, and actively subvert other types of banks, then the banks created have a good chance of surviving.

James E. Hartley, *Mutual Deposit Insurance: Other Lessons from the Record*, 6 INDEP. REV. 235, 248 (2001).

193. *See* Bradley et al., *supra* note 191, at 25 n.7.

194. *See* Bradley et al., *supra* note 191, at 25 n.6.

195. *See* Bradley et al., *supra* note 191, at 26; McCoy, *supra* note 109, at 429–30; Edward Garnett et al., *A History of Risk-Based Premiums at the FDIC*, FEDERAL DEPOSIT INSURANCE CORPORATION REPORT NO. 2020-01 (Jan. 2020), https://www.fdic.gov/analysis/cfr/staff-studies/2020-01.pdf [perma.cc/9EEB-WKG9].

Others have suggested that public insurance mechanisms increase moral hazard by disincentivizing private parties from engaging in monitoring. Moreover, they argue that private monitoring is much better than public monitoring. *See, e.g.*, Jonathan R. Macey & Geoffrey P. Miller, *supra* note 159, at 1167–69, 1193–99. That being said, private monitoring of financial institutions depends on the availability of credible financial information that only the government can credibly make available to private parties.

196. *See* Bradley et al., *supra* note 191, at 27.

197. *See* NAT'L CREDIT UNION ADMIN., REPORT TO THE CONGRESS: STUDY OF FURTHER POSSIBLE CHANGES TO THE DEPOSIT INSURANCE SYSTEM 17–21 (2005), https://ncua.gov/files/testimonies/DepositInsuranceStudyReporttoCongress-Ver6-4.pdf [perma.cc/DL6X-8TWM].

198. *See id.*; Demirgüç-Kunt & Detragiache, *supra* note 147.

199. Alternatively, healthy banks might leave the pool before a claim is made. *See* William B. English, *The Decline of Private Deposit Insurance in the United States*, 38 CARNEGIE-ROCHESTER CONFERENCE SERIES ON PUBLIC POLICY 57, 84–86 (1993).

willingness to act in times of crisis.[200] The most positive evidence tends to come from countries with unique institutional contexts.[201] Perhaps most importantly, private insurance mechanisms might be ineffective at stopping runs because they might lack the requisite credibility. Depositors might be worried about their ability to fully fund their claims—unless, of course, the private insurance is itself backed by the government.[202]

Additionally, private insurance mechanisms might actually *increase* financial contagion and concentration. Empirical evidence, both from laboratory[203] and natural experiments[204], suggests that increased bank interconnectedness can increase both the likelihood and magnitude of contagion.[205] Recent theoretical models support the view that increased bank interconnectedness can increase moral hazard, in turn increasing interconnectedness and financial contagion.[206] As such, private insurance mechanisms can actually backfire and increase contagion risk.

More particularly, these proposals (e.g., the creation of a private RFT FDIC or an RFT mutual insurance syndicate) are not realistic in the context of RFTs. Current market conditions have not *already* organically led to the creation of such private insurance mechanisms, and it is unclear why we should bet on their organic emergence in the future. Furthermore, even if the market dynamics were present for the creation of such a mechanism, it is unlikely that RFT issuers could effectively implement a private insurance mechanism in the absence of significant regulation.[207] Currently, information about RFT issuers' balance sheets and risk-taking is incredibly opaque. Absent regulation that required RFT issuers to publish complete, transparent, and credible financial information, private parties will be unable to either (i) effectively and efficiently monitor both bank risk-taking[208] and (ii) properly price deposit insurance premiums. Voluntary compliance is unlikely to solve the issue, as private incentives to provide incomplete or overly positive

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200. *See id.* at 93–99 (1993). They also might suffer from increased fraud, as a way to shore up bank balance sheets in a crisis, seeking to reverse losses before those become public. *See* Charles W. Calomiris, *The Decline of Private Deposit Insurance in the United States: A Comment*, 38 CARNEGIE-ROCHESTER CONFERENCE SERIES ON PUBLIC POLICY 129, 132 (1993).

201. *See* Thorsten Beck, *Deposit Insurance as Private Club: Is Germany A Model?*, 42 Q. Rev. Econ. & Fin. 701 (2002).

202. *See* Diamond & Dybvig, *Banking Theory*, *supra* note 145, at 80.

203. Brown et al., *supra* note 72, at 24.

204. *See, e.g.*, Iyer & Peydró, *supra* note 79.

205. *But see* Dan Ladley, *Contagion and Risk-Sharing on the Interbank Market*, 37 J. ECON. DYNAMICS & CONTROL 1384 (2013), https://www.le.ac.uk/economics/research/RePEc/lec/leecon/dp11-10.pdf [perma.cc/4CXE-R6X8] (modeling the effect of increased interbank lending using a computational simulation and finding that increased lending increases banking stability to small shocks but decreases banking stability to large shocks).

206. *See, e.g.*, Altinoglu & Stiglitz, *supra* note 144. Interestingly, while Altinoglu and Stiglitz's analysis is worried about systemic risk more broadly, their proposal—a tax on bank investments in other banks' risky investments which would increase system interconnectedness—resembles in important ways our Coin Tax. *See id.* at 62–63.

207. *See* Diamond & Dybvig, *Banking Theory*, *supra* note 145, at 59.

208. *See* McCoy, *supra* note 109, at 432; William B. English, *supra* note 199, at 75–76, 92–93 (1993) (describing the informational gaps that made private insurance arrangements fail in the 1980s).

information are high.[209]

III. REGULATORY TAXATION OF RFTS: A COIN TAX

A leading commentator noted that there were "two points of view" about the problem of the shadow banking system. On the one hand, we would "recognize that the shadow banking system is a genuine banking system, in which case we would seek to preserve it but make it much less vulnerable to a run." On the other, "we could try to squelch it."[210] This dilemma seems to capture the scholarly and policymaker consensus on RFTs, with some seeking to (i) "outcompete" stablecoins through a publicly issued coin;[211] (ii) wholly restructure the banking regulatory system to accommodate RFTs and tailor their regulation;[212] or (iii) more drastically, keep the current regulatory system and ban private money creation altogether outside of the regulatory perimeter.[213] (Recent government pronouncements have instead sought to break with this thinking and to fully "promote" RFTs such as stablecoin.)[214]

We break with the consensus dilemma and propose a third point of view: to tax the system through a Coin Tax. Our approach recognizes both the external harms RFTs impose on society and RFTs' potential to improve social welfare, while also, as we saw in Part II, acknowledging the considerable difficulties in practically and effectively applying current regulatory approaches to novel forms of private money creation. We believe this combination of factors means that a relatively unorthodox approach (at least in the context of banking regulation) is both needed and warranted. Moreover, the unique ability to dial up (or down) the Coin Tax's tax rate allows policymakers to more accurately respond to assessments of the social utility of RFTs while retaining policymakers' ability to squelch RFTs through high tax rates if necessary.

We introduce in this part the possibility of using taxation as a regulatory instrument to confront the contagion risk from runs on RFTs. In particular, we introduce a type of Pigouvian tax that would mitigate the financial contagion risks posed by RFTs. This Coin Tax would fall on issuers and users of RFTs[215] and would be designed to reduce the contagion risks imposed on external parties by RFTs.[216]

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209. *See* Diamond & Dybvig, *Banking Theory*, *supra* note 145, at 59.

210. GORTON, *supra* note 87, at 197.

211. Gorton & Zhang, *supra* note 7, at 956–62 (describing the "outcompeting" perspective, but noting that co-existence between CBDC and privately-issued coins remains the most likely outcome).

212. *See, e.g.*, Awrey, *supra* note 7, at 60–69 (proposing a new tripartite banking regime, dividing the regulation of commercial banks, monetary institutions, such as PayPal, and lending institutions).

213. *See* Stablecoin Classification and Regulation Act of 2020, H.R. 8827, 116th Cong. (2020) (proposing that stablecoins be issued only by depositary institutions within the regulatory perimeter); Gorton & Zhang, *supra* note 7, at 950–51 (arguing that Glass-Steagall could be reinterpreted to require stablecoin issuers to issue coins through the banking system, but noting that issuers could circumvent these requirements). *See also* RICKS, *supra* note 39, at 234–43 (proposing a general ban on money creation by entities not within the banking regulatory perimeter).

214. *See supra* note 27.

215. *See infra* Section III.D.1.

216. As we will later see, the Coin Tax will significantly *reduce*, but not *eliminate*, the contagion risks from RFTs. *See infra* Section III.B. The revenues from the Coin Tax could be used to implement

At first blush, resorting to something like Pigouvian taxation may seem a rather odd suggestion. The lesson of Part II is that the ongoing prospect of run risk for RFTs can best be understood as an instance of banking suffering from (i) the under-provision of insurance[217] and (ii) the absence of alternative coordination mechanisms to solve the prisoner's dilemma apparent under the Diamond-Dybvig model, such as suspension of convertibility or LOLR schemes.[218] And, as a general matter, taxation and insurance are not good regulatory substitutes. The provision of genuine insurance implies an arrangement in which parties to an insurance pool agree to pool and share *ex ante* risk through actuarially sound premium pricing. It is a core part of the economics of insurance that some members (though not all) will suffer the insured-against loss and then will be able to make claims against and receive payouts from the monetary reserves of the insurance pool. Further, it is part of actuarially sound insurance pricing that participants in a pool who present greater risk of loss must pay more into the pool by the way of the premium (i.e., the basic reason term life insurance costs a lot more for an otherwise healthy seventy-year-old versus an otherwise healthy twenty-five-year-old).

Tax instruments seem to lack these core economic features of insurance. Taxes are generally imposed upon some statutorily defined base (e.g., income, sales, property value) or transaction (e.g., stock buybacks) that is not defined in terms of the risk profiles of a particular taxpayer. Further, taxes (other than in the case of tax expenditures) are revenue-raising instruments that do not in themselves stipulate a compensatory distribution mechanism along the lines of claims payment from an insurance pool. That is, they are meant to raise money, not pool money for later distribution. Rather, the expenditure of revenue raised through tax instruments must be determined through some other appropriations mechanism—contra insurance, where the underlying contractual arrangements already dictate the distributional claims on the pool.

In spite of these obvious distinctions between insurance and tax, a careful consideration of the insights provided by the Diamond-Dybvig model demonstrates why tax is in fact a potential regulatory instrument in this context. Consider here the distinction between insolvency and illiquidity. Insolvency—in cases where it is *not* precipitated by a liquidity crisis and accompanying fire sale of assets—presents a classic sort of economic harm for which insurance is a suitable instrument. Some banks will fail. They will do so for a host of reasons. The existence of insurance does not remove or eliminate such bank failures; it just spreads losses from the phenomenon across the pool.

Bank runs, contagion, and insolvency *induced by a liquidity crunch* present a different sort of problem altogether. These are phenomena that are plausibly eliminated in the presence of adequate insurance, as we have seen.[219] As historical

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mechanisms seeking to fundamentally eliminate the contagion risk dynamics, were that policymakers' goal. *See infra* Section II.B.2.

217. *See supra* Section II.B.

218. *See supra* Section II.A.

219. *See supra* Section I.D.1.

evidence of this claim, consider the fact that since the 1930s the FDIC has paid many claims to insured depositors with respect to failed banks (that is, evidence consistent with a genuine insurance pool with some losses and claims), but we have in general avoided system-wide bank runs or contagion from liquidity crunches (that is, a fact that is not a core goal of insurance).[220] Another way to draw this distinction is that the role of deposit insurance in stemming bank runs is not to function as insurance *qua* insurance; its role is merely to function as a coordinating mechanism to dissolve an otherwise present prisoner's dilemma.[221] This is crucial because there could be other coordinating mechanisms that are not structured as formal insurance arrangements.

To fill this out with a stylized example, let us consider a simple case of contagion risk. Suppose one pool of banks (Pool A) insures itself against first-order insolvency risk (the term "first-order" here meaning that the insured harm is insolvency that is not causally induced by illiquidity), and another pool of banks does not (Pool B). The Pool A insurance can be seen as having five different effects:

1. Protect Pool A members from first-order failure via the mechanism of using premiums to pay off deposits of the institution that failed.
2. Protect members of Pool A from being affected by contagion from Pool A because its depositors will not engage in preemptive runs. That is, depositors in Pool A will generally not withdraw from healthy banks just because a bank in Pool A has failed, because they know they are protected from first-order failure (i.e., Effect 1).
3. Protect members of Pool B from being affected by contagion from Pool A—even though Pool B has not paid for this. In this way, Pool B is benefitting from a positive externality of Pool A insurance.[222]
4. *Not* protect members of Pool A from Pool B contagion. If Pool B contagion causes a liquidity crisis, then their insurance will not cover it. In this way, Pool A is suffering from a negative externality of underinsurance for Pool B.
5. *Not* protect members of Pool B from Pool B contagion caused by the failure of a Pool B bank.

The protection against first-order insolvency risk (Effect 1) is genuine insurance (pooling of premiums to pay claims) and suffers from the general ills of insurance (e.g., moral hazard here with respect to a bank undertaking excessively

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220. *See supra* notes 85–91 and accompanying text (discussing the historical success of public deposit insurance in preventing runs in the United States).

221. While this distinction has been lost on most, differences between deposit insurance and other kinds of insurance have not been lost on commentators. *See, e.g.*, Mccoy, *supra* note 109, at 423. ("[O]ne must keep in mind that *deposit insurance is not really insurance, but a guaranty against loss*.") (emphasis added).

222. Some might argue that Pool B members might still be worried about Pool A's insurance claims. If that is the case, there might still be *some* financial contagion in Pool B. This result hinges on empirics regarding channels through which contagion travels and the information available to Pool B. *See supra* notes 77–82 and accompanying text. However, it seems highly unlikely that the *almost failure* of insured Pool A result in "more contagion" (however quantified) than the actual *failure* of uninsured Pool A. As such, it is evident that Pool A's insurance has a positive externality on Pool B, even the insurance of Pool A only partially protects Pool B.

risky asset positions on its balance sheet and the concomitant reduction in private monitoring given the insurance[223]). Like all general insurance, this is not a good candidate for replacement by taxation.

The protection against contagion (Effect 2 and Effect 3) is crucially different. It is a byproduct of the first-order insolvency insurance but does not itself function as insurance. That is, if it works properly, there are actually *no* claims: These are healthy banks that have been protected, after all, so no depositor will be harmed, and no claims are therefore made. Relatedly, the contagion risk faced by Pool A (Effect 4) and Pool B (Effect 5) is best conceived of as a negative externality from *underinsurance* of Pool B members.

A good analog here is the individual mandate under the Affordable Care Act. The individual mandate required individuals to pay a fine if the person failed to carry adequate insurance.[224] Whether that levy constituted a "tax" for U.S. constitutional purposes was, of course, heavily contested, and ultimately resolved in *National Federation of Independent Business v. Sebelius.*[225] Regardless of whether the mandate is a "tax" or not under the U.S. Constitution, the mandate bears certain functional similarity to a Pigouvian tax. The mandate should operate as a sort of stick; if a person can either pay a levy and *not* have insurance or pay premia and have insurance, then we generate a clear incentive for people to insure themselves.[226] This is the basic logic behind the mandate. The levy thus should reduce the quantity of the negative-externality-creating state of affairs—that is, the quantity of uninsured individuals. Likewise, the basic premise of the Coin Tax is to reduce or ameliorate the negative-externality-creating state of affairs—that is, the contagion risk to external parties from RFTs. In this part, we show how that might work.

This part will follow in four sections. First, we will provide some background on Pigouvian taxes and their legal precedents in the context of private money creation. Then, we will examine the basic implementation and design details of our Coin Tax, discussing the tax's base, rate, revenues, and administration. Then, we will discuss a few design tweaks from the typical Pigouvian tax, examining how particularities of the externality we are addressing (i.e., the risk of financial contagion) have specific design implications. Lastly, we will discuss some general advantages offered by the Coin Tax over alternative regulatory tools.

A. Pigouvian Coin Tax: Theoretical, Historical, and Legal Precedents

Although novel, the Coin Tax we propose is not unprecedented. From an economic theory perspective, the Coin Tax draws from the long literature on Pigouvian taxation more generally and financial transaction taxes more particularly.

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223. *See* McCoy, *supra* note 109, at 422.

224. 26 U.S.C. § 5000A.

225. Nat'l Fed. of Indep. Bus. v. Sebelius, 567 U.S. 519, 561–574 (2012). The Court even analogizes the tax to the most prominent Pigouvian tax: a tax on cigarettes. "Today, federal and state taxes can compose more than half the retail price of cigarettes, not just to raise more money, but to encourage people to quit smoking." *Id.* at 567 (internal citations omitted).

226. *Id.* at 567.

The Coin Tax also has robust historical precedents, with similar taxes being implemented worldwide—and in the United States. It also has a noble legal lineage, with Supreme Court decisions upholding the propriety and constitutionality of similar taxes.[227] That has recently led prominent commentators to argue for the emergence of a "Pigouvian administrative state"[228] and to endorse a Pigouvian approach to the Constitution.[229]

A Pigouvian tax[230] is a tax that is imposed to correct a firm's social harm to third parties, and it is generally sized to equal the harm that the firm imposes on third parties.[231] As an illustration, think of an industrialist choosing a production process for a paper mill that is inconveniently located next to a nearby village's water source. The first process, the clean process, has a 90% expense margin (i.e., the industrialist makes 10 cents of profit for every dollar of revenue). The second process, the dirty process, has a 60% expense margin (i.e., the industrialist makes 40 cents of profit for every dollar of revenue)—but it pollutes the nearby water source. The pollution of the nearby water source is costly to the villagers in terms of health hazards and the costs of remediating them, or the costs of cleaning the water to avoid them, amounting to 40 cents for every dollar of paper produced by the paper mill.

A standard law-and-economics model would look at the cost of the pollution of the water source to determine if, considering the volume produced by the paper mill, the extra profits of the dirty process could compensate the victims of the pollution so everyone is better off—despite the pollution.[232] Evaluating the processes in this way would result in the industrialist opting for the *clean* method, as the extra profits from the dirty method (30%) are not enough to compensate the villagers for the cost of polluted water (40%). This is not, however, how an industrialist would make the decision because the costs are not shared: The industrialist gets to keep the extra profits from using the dirty method for himself,

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227. *See infra* notes 269–274 and accompanying text.

228. *See* Jonathan Masur & Eric A. Posner, *Toward a Pigouvian State*, 164 U. PENN. L. REV. 93 (2015).

229. *See* Peter N. Salibo, *The Pigouvian Constitution*, 88 U. CHI. L. REV. 1081 (2021).

230. *See supra* note 30.

231. *See* PIGOU, *supra* note 36.

232. Recent optimal tax literature on environmental Pigouvian taxation has worried that this analysis is too simplistic, raising two main concerns. First, there is a concern that Pigouvian taxation assumes a world in which labor decisions are unaffected by income taxation, and that the imposition of a Pigouvian tax might overall reduce social welfare given existing labor distortions. Second, some worry that Pigouvian taxation does not sufficiently take into account distributional concerns. As pointed out by Kaplow, both of these concerns are misguided from a theoretical perspective. A Pigouvian tax could be designed in a way that it does not further distort labor decisions. Moreover, a properly designed Pigouvian tax would be potentially Pareto efficient. Redistributive policies on top of the Pigouvian tax could achieve the socially desired distribution while still enhancing total social welfare. *See* Louis Kaplow, *Optimal Control of Externalities in the Presence of Income Taxation* 9–10 (Int. Econ. Rev., Working Paper No. 12339, 2012), https://www.nber.org/system/files/working_papers/w12339/w12339.pdf [perma.cc/FZX8-WMEK]. That being said, the necessity of pairing these taxes with properly designed rebates or other redistributive policies to address distributional concerns cannot be understated, given the snowballing effects of not doing so. *See* Daniel Giraldo Paez & Zachary Liscow, *Inequality Snowballing*, 77 INT'L REV. L. & ECON. 1 (2024).

and while the costs of water pollution are high, they are borne by the village, not the industrialist. As such, the industrialist will choose the *dirty* production method—absent some sort of regulation.[233]

An optimally set Pigouvian tax would force a supplier to internalize social cost (i.e., the costs that are imposed on the external parties, the village), thereby producing at a level in equilibrium that is optimal from a social perspective. In our example, it would involve a tax on the industrialist equal to the social cost of polluting the nearby water source (i.e., a tax equivalent to 40% of revenues). Absent some changes in the industrialist's production technologies,[234] that would mean that the industrialist would have to choose between producing with a dirty process and making no profit (60% expense margin plus a 40% tax on revenue) or a clean process and making 10% profit (90% expense margin plus 0% tax). As a result, the tax induces the industrialist to produce through the clean method, aligning his incentives with the social benefits and costs of his production decisions. From an equilibrium perspective, we would expect the market to achieve an otherwise efficient equilibrium,[235] with the industrialist producing less paper and less pollution—not necessarily producing zero but rather producing the efficient amount that fully accounts for the social costs and social benefits of the production.

Although the most prominent Pigouvian taxes might be soda, cigarette, or carbon taxes, Pigouvian taxes have been previously proposed and implemented as a way to internalize costs from financial transactions. Perhaps most famously, Nobel laureate James Tobin introduced the idea of a tax on foreign currency exchange transactions as a way to throw "sand into the gears" of these markets to ensure their efficient (i.e., not excessively volatile) functioning and to correct excessive speculation.[236] These taxes were conceived to be imposed uniformly at an international level so as to reduce the negative externalities imposed on small economies by the speculation in foreign exchange rates.[237]

Since then, "Tobin taxes" have been proposed in many flavors. For example,

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233. *See* PIGOU, *supra* note 36, at 172 (describing a situation in which private and social costs diverge and noting how a firm will make decisions based on its private costs).

234. Or changes to the industrialist's margins form the production of fewer paper units.

235. We are not venturing into the optimal tax discussion about the design and efficiency implications on Pigouvian taxes of the distortion produced by income taxation. That discussion mainly concerns policymakers who are setting the exact rate of the tax or assessing its appropriate base and is therefore outside of the scope of this present Article. In any case, the distortionary effects of income taxation might affect implementation details, but do not alter the fundamental case for Pigouvian taxation. *See, e.g.*, Kaplow, *supra* note 232; Alan J. Auerbach & James R. Hines Jr., *Taxation and Economic Efficiency, in* 3 HANDBOOK OF PUBLIC ECONOMICS 1347, 1387–89 (2002) (discussing how the marginal cost of public funds might affect the proper rate for a Pigouvian tax). Other considerations, however, might determine whether Pigouvian taxation is an appropriate mechanism to address an externality. *See, e.g.*, Victor Fleischer, *Curb Your Enthusiasm for Pigovian Taxes*, 68 VAND. L. REV. 1673, 1675–78 (2015). In our case, an assumption of uniform marginal social cost is apposite, given that contagion risks should generally be uniform across RFTs—while RFTs might vary in riskiness, their size is well-correlated with their contagion risk, and as such, the "distribution of marginal social cost is normal and narrow" making it a good candidate for a Pigouvian tax. *Id.* at 1701-02.

236. James Tobin, *A Proposal for International Monetary Reform*, E. ECON. J. 153, 154 (1978).

237. *See id.* at 156–57.

Summers and Summers proposed a Pigouvian Securities Transfer Excise Tax (STET) to "curb[] the excesses associated with short-term speculation."[238] The STET was meant to broadly target speculation in the securities markets, which Summers and Summers associated with evils such as securities excess price volatility, the differential between price and value, and the shortening of managerial horizons.[239] "When the capital development of a country becomes the by-product of the activities of a casino," Summers and Summers argued, "the job is likely to be ill-done."[240] The STET was designed to have a broad base, covering almost all marketable securities and their equivalents[241] in which a beneficial U.S. person or a U.S. asset is involved.[242] (More recently, legal scholars like Masur and Posner have pushed for similar taxes.)[243]

Tobin taxes (understood broadly) have been adopted by several countries. France, for example, has introduced a Tobin tax, seeking to reduce volatility and speculation, with some success.[244] The United Kingdom has introduced analogous taxes, such as stamp duties, that consistently raise significant amounts of revenue.[245] International experience with similar taxes thus suggests that implementing a Coin Tax is administratively feasible.[246]

While there is a dearth of work on Pigouvian taxation as a corrective for specific financial stability risks, a couple of scholars have proposed Pigouvian taxes to address flaws with current banking regulation. Cochrane argued that Pigouvian taxes on short-term debt issued by banks could serve as a superior alternative to balance sheet banking regulation and could thus protect the financial system from traditional runs on banks.[247] Furthermore, Masur and Posner see Pigouvian taxes as a way to regulate the financial sector more generally.[248] So have Shackelford, Shaviro, and Slemrod.[249]

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238. Lawrence H. Summers & Victoria P. Summers, *When Financial Markets Work Too Well: A Cautious Case for a Securities Transaction Tax*, 3 J. FIN. SERVS. RES. 261, 261 (1989).

239. Summers & Summers, *supra* note 238, at 263-74.

240. *Id.* at 263.

241. Summers & Summers, *supra* note 238, at 280.

242. Summers & Summers, *supra* note 238, at 283.

243. *See* Masur & Posner, *supra* note 228, at 124–28.

244. *See* Leonardo Bechetti et al., *The Impact of the French Tobin Tax*, 15 J. FIN. STABILITY 127 (2014). *Contra* Jean-Edouard Colliard & Peter Hoffmann, *Financial Transaction Taxes, Market Composition, and Liquidity* (Eur. Cent. Bank, Working Paper No. 2030, 2017), https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp2030.en.pdf [perma.cc/DFX5-AP6G].

245. *See* Thornton Matheson, *Taxing Financial Transactions: Issues and Evidence* 37 (IMF, Working Paper No. WP/11/54, 2011), https://www.imf.org/external/pubs/ft/wp/2011/wp1154.pdf [web.archive.org/web/20251015173247/https://www.imf.org/external/pubs/ft/wp/2011/wp1154.pdf].

246. The evidence on the success of Tobin taxes is more mixed and is highly contingent on the governmental rationale behind the tax, competitive dynamics that the country faces, design details, and the possibility of international cooperation. *See* Leonard E. Burman et al., *Financial Transaction Taxes in Theory and Practice*, 69 NAT'L TAX J. 171 (2016); Neil McCulloch, Grazia Pacillo, *The Tobin Tax – A Review of the Evidence*, 68 IDS RSCH. REPS. 1 (2011).

247. *See* Cochrane, *supra* note 40, at 217–18.

248. *See* Masur & Posner, *supra* note 228, at 124–34.

249. *See* Douglas A. Shackelford et al., *Taxation and the Financial Sector*, 63 NAT'L TAX J. 781 (2016).

Yet perhaps more relevant than the practical international experience with these taxes is the United States' own experience with taxes on money creation as a corrective measure. During the "Free Banking Era," private banks in free banking states were able to issue their own bank notes, as long as they were backed by state bonds as collateral and were redeemable for gold and silver.[250] The Free Banking system had several problems. First, the proliferation of bank notes made their use impractical—if one would be hard pressed to use a ten dollar Planters Bank of Tennessee note in Philadelphia,[251] and doing so would result in taking a large discount to the note's face value, a discount that could rise up to twenty-five percent![252] Moreover, the "riskless" collateral backing these notes—state bonds—were not that safe, making both the notes (and the banks that issued it) vulnerable. As Gorton notes, "[o]f the thirty-four free banks that failed in New York State during the period 1838–1863 [the Free Banking Era], most of them failed in 1841 or 1842" and held bonds of states that were defaulting on interest payments.[253]

Partly responding to the chaotic Free Banking Era,[254] the federal government sought to take control of the issuance of money. Congress enacted several laws starting in 1862 seeking to take control of the issuance of money by introducing the national notes and nudging private banks to become national banks.[255] However, that did not stop the circulation of private bank notes.

In 1865, Congress took decisive action: Congress enacted a 10% tax that applied to the issue of bank notes by state banks—but did not apply to federal banks.[256] The tax "den[ied] the state banks *de facto* the privilege of note issue"[257] and

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250. GORTON, *supra* note 87, at 12.

251. *Id.* at 13.

252. *Id.* at 14 fig.2.2.

253. *Id.* at 17.

254. The passing of the National Bank Acts of 1863-64 was primarily motivated by the need to finance the U.S. Civil War. GORTON, *supra* note 79, at 19; Joseph M. Cormack, *The Legal Tender Cases—A Drama of American Legal and Financial History*, 16 VA. L. REV. 132, 133–35 (1929). But the National Bank Act succeeded in reducing the chaos of the Free Banking Era caused by the discounting of private notes, as Justice Chase (the architect of the National Bank Acts) reminds us in *Veazie Bank v. Fenno*, 75 U.S. 533 (1869). *See* Kenneth W. Dam, *The Legal Tender Cases*, 1981 SUP. CT. REV. 367, 374–76.

255. The National Banking Acts of 1862-1863 established that the Federal Government would take over the production of money. *See* An Act to Provide a National Currency, Secured by A Pledge of United States Stocks, and To Provide for the Circulation and Redemption Thereof, 12 Stat. 665 (1863). The Act initially imposed an excise tax of one percent on the creation of private banknotes, with a two percent penalty for nonpayment. *See id.,* § 19, at 670. *See also* Veazie Bank v. Fenno, 75 U.S. 533, 538 (1869) (discussing the history of the tax). The Act of 1865 increased the tax to ten percent. *Id.* at 539. The Court also determined that such a tax was not a direct tax. *Id.* at 547 ("Taxes on other objects are included under the heads of taxes not direct, duties, imposts, and excises, and must be laid and collected by the rule of uniformity. The tax under consideration is a tax on bank circulation and may very well be classed under the head of duties."). Moreover, the Court noted that the Federal Government's powers vis-à-vis the currency would alone justify the tax. *Id.* at 549 ("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.").

256. *See* Act of Mar. 3, 1865, ch. 82, 13 Stat. 498; FRIEDMAN & SCHWARTZ, *supra* note 76, at 18; GORTON, *supra* note 87, at 17–18.

257. *See* FRIEDMAN & SCHWARTZ, *supra* note 76, at 18. Congress had previously approved

was intended to "eliminate the use of private banknotes."[258] As a result of the tax, "state banks converted to national banks in droves, and state banks were widely believed to be on the way to near extinction." (The decline in relative importance of bank note issuance versus banking deposits, and the light-touch regulation of state banks, would later reverse the trend.)[259] But, as a result of the tax on private bank notes, a uniform note system emerged. In *Veazie Bank*, the Court found that both the tax was indirect and that the imposition of an excise tax on private bank notes was within Congress' powers.[260] As such, not only is a tax on money issuance by private parties not *novel* but also is buttressed on solid constitutional foundations.[261]

As should be evident from our brief overview, the Coin Tax is not without precedent. Economic models have long suggested that taxes could be used as a way to prevent or alleviate the harm from externalities, and the literature has supported the use of taxes to reduce financial instability and the implementation of constant redemption fees to prevent runs. These theoretical taxes have actually been implemented: Throughout the world, countries have experimented with Tobin taxes and the United States has in the past—in a constitutional manner—imposed excise taxes on private money creation.

B. Implementation Details for Coin Tax

1. Taxing Authority and Taxable Transaction

Two initial design questions for the Coin Tax are the identity of the taxing jurisdiction/authority and the definition of the taxable transaction. Regarding the former question, we write with full acknowledgment that the RFT market is still in its infancy. As currently structured, there is a fairly obvious answer to this question. As almost all market capitalization of RFTs is denominated in U.S. dollars, the U.S. federal government is the obvious candidate for the jurisdiction to tax. There are substantive reasons to support this conclusion as well. The Coin Tax operates as a regulatory substitute to public insurance, with the missing public insurance in this case being, rather clearly, the U.S. federal deposit insurance scheme. As a general matter looking forward, we would presume that the Coin Tax in general should be a fiscal instrument imposed by a sovereign jurisdiction that issues the fiat currency to which the RFT is pegged.

Regarding the scope of the taxable transaction, it will be necessary to distinguish two types of transactions: issuance of RFTs and subsequent trade in RFTs. We

several smaller taxes on bank note issuance. *See, e.g.*, 12 U.S.C. § 541 (imposing a one percent tax on bank note circulation by national banks). Such taxes had been insufficient to stem private money creation to a significant degree. *See* FRIEDMAN & SCHWARTZ, *supra* note 68, at 18.

258. GORTON, *supra* note 87, at 240 n.3. *See also* Veazie Bank v. Fenno, 75 U.S. 533 (1869) (holding that the excise tax on private banknotes was constitutional).

259. *See* FRIEDMAN & SCHWARTZ, *supra* note 76, at 18.

260. *Veazie Bank*, 75 U.S. at 541. *See also* Dam, *supra* note 254, at 374–76 (contextualizing *Veazie Bank*).

261. Dam, *supra* note 254, at 367 (discussing how the *Legal Tender Cases* have faded from academic discourse, including textbooks, as they are taken for granted).

contemplate that the Coin Tax would necessarily apply to the issuance and may broadly apply to subsequent transfers as well. We separate out these transactions because, although they could each pose risk to the broader financial system, the risks are different. The primary risk arises with respect to the issuer. This is because it is the issuer who stands ready to redeem RFTs in exchange for the assets it holds as reserves. It is the risk that the RFT issuer cannot meet all redemption promises that drives the basic prisoner's dilemma in the Diamond-Dybvig model, and this is the first order concern that must be addressed.[262]

Downstream users are also relevant, however.[263] RFTs would have little functionality (or value) if the only thing you could do with the tokens is buy them from an issuer, hold them during a period in which you earn no interest, and redeem them with the issuer for fiat currency. RFTs derive value, rather, from the fact that they serve as a *stable* payment mechanism that is native to the blockchain and permit ready movement in and out of *unstable* digital assets. Thus, parties who trade in RFTs are deriving a private benefit and imposing a social cost (the risk of contagion induced by the assets in which they hold a position), thereby making downstream transfers also a suitable subject for externality-correcting taxation. The two types of actors (issuer versus user) do, however, play different roles, suggesting different design characteristics for the Coin Tax, as discussed further below.

2. Rate

Setting the rate on the Coin Tax is simple in theory but difficult in practice. As a modified Pigouvian tax, we can begin with the orthodox statement that an optimal instrument would be set at a rate that matches the social cost that is currently being unaccounted for in the market.[264] At that level, marginal social cost and marginal social benefit equalize, and we reach an efficient equilibrium. So much for theory. What is an actual quantitative measure of unpriced social cost?

Although a difficult exercise, we think the best approach here is to understand the Coin Tax as a regulatory substitute for public insurance. In this sense, the unpriced social cost can be approximated by the insurance premia that are not being collected with respect to RFTs. As RFT issuers are not within the regulated banking sector, we cannot say with any certainty what the unpaid premia would be. But we have a reasonable substitute. In particular, there is some recent research that has attempted to model and price the expected premia for RFTs in *private* insurance markets.[265] Estimates in this nascent literature range from an annualized private insurance cost near zero to thirteen cents per dollar, with most issuers facing a two cent premium. Future empirical work would undoubtedly be needed to estimate a

262. *See supra* Section I.B.

263. *Cf.* Summers & Summers, *supra* note 238, at 282–84 (arguing that a STET should apply to all sorts of transactions, issuances, and downstream transactions, because they all contribute to speculation and increased financial instability).

264. *See supra* note 231.

265. *See* Stefan A. Jacewitz & Chris Acker, *Method for Estimating the Price of Stablecoin Insurance*, 109 ECON. REV. 1 (2024).

tighter range of expected premia for RFT issuers. However, it is important to stress here that in proposing a Coin Tax we do not mean to go down the road of assessing the "correct" premium payment in an issuer-specific way.[266] This is precisely to revert to the public insurance model, which we think is not viable for reasons discussed above.[267] The Coin Tax would have to operate in terms of aggregates and averages; for example, a tax might be set at two cents per dollar of issued RFT per year for all issuers. The great advantage of this approach is that the regulatory authority needs only very limited information to assess this tax. The disadvantage is that we are treating regulated actors in the same way even in instances where underlying economic fundamentals would suggest they be treated differently. (That being said, the mandatory aspect of the tax alleviates the concerns about adverse selection we would have from a flat rate in an insurance scheme, and further measures could be taken to reduce moral hazard.)[268]

This flat rate structure could be adjusted, however, if not constrained by administrative capacity. Contagion risk is positively correlated with the magnitude and interconnectedness of the RFT.[269] Moreover, research suggests that contagion risks increase exponentially as size and interconnectedness increase over a certain threshold.[270] While underlying risk (based on the underlying issuer's balance sheet) is hard to evaluate by regulators, RFT size is not.[271] As such, regulators might opt for a tax with higher rates for larger issuers over a flat tax. That would more accurately capture an issuer's risk of financial contagion without imposing significant informational or institutional capacity costs on the government. However, important design decisions—such as the determination of how to measure size (market capitalization or a proxy for "deposits"), whether to measure size per RFT issuer or per RFT (in case an issuer issues several RFTs), and whether to exclude foreign RFT-issued tokens for foreign RFT issuers—will remain. Further empirical work testing the relationship of these variables to contagion and instructive analogies to the design of public insurance[272] should help regulators effectively design such a system.

Reliance on estimated premia for private insurance is a viable approach for tax on RFT issuers but is not viable for downstream transactions. The estimated insurance cost here is about the risk of being unable to redeem—a promise made uniquely by the issuer. For downstream transactions, we would need some other

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266. This approach resembles what economists see as best practice in implementing real-world Pigouvian taxes. *See, e.g.*, William J. Baumol, *On Taxation and the Control of Externalities*, 62 AM. ECON. REV. 307, 307–08, 318–20 (1972) (setting rates for Pigouvian taxes not equal to average social cost but by estimating the rate that would lead to the desired quantity of the taxed activity).

267. *See supra* Section II.B.

268. *See infra* Section III.B.2.

269. *See, e.g.*, Altinoglu & Stiglitz, *supra* note 144.

270. *See id.* Ladley, *supra* note 205.

271. Such data is easily available from private estimates by services like Coinbase, for cryptoassets, or Bloomberg, for a broader range of instruments.

272. *See supra* note 166 (collecting sources discussing best practices for the design of a risk-adjusted premium for public insurance).

method of assessing the rate. Further empirical work should seek to estimate the size of the externality, such that adequate rates can be set. We can confidently say that the rate for downstream transactions would be much lower than the rate with respect to the act of issuance.

3. General Administration and Compliance

The entire premise of this Article is that it will likely not be feasible to bring RFT issuers as a whole into the bank regulatory insurance scheme. The regulatory burdens are likely too high, the design and implementation requirements too onerous, and the alternative options (e.g., collateralization with assets outside the regulatory domain or the emergence of even riskier and less regulated assets) too great for a public insurance option to be workable.[273]

But this begs an obvious question: How do you get RFT issuers to comply with and pay Coin Tax? At a high level of generality, our premise is that the United States stands in a unique position as the issuer of the world's reserve currency. The U.S. dollar is the obvious asset of choice to collateralize RFTs. This is, of course, borne out by the status quo regarding choice of collateral by RFT issuers. This gives the United States some leverage to regulate. We think it unlikely that RFT issuers would flee the dollar upon imposition of *any* regulatory burden. The key is to impose a regulatory burden that stabilizes the system while still making it the case that collateralizing with the U.S. dollar is the RFT issuer's preferred outcome. We think that a well-designed Coin Tax could hit that sweet spot. We imagine that occurring through a conjoining of carrots and sticks as described below.

Regarding regulatory penalties, one could follow the lead of proposals that have already been put in place in attempts to stifle RFTs. Consider, for example, the suggestion that bank regulators ought to eliminate RFTs by limiting RFT issuers' access to banks within the Federal Reserve system.[274] RFT issuers collateralizing with U.S. dollars will need some place to hold dollar reserves, which practically means they require access to the Federal Reserve system of banks. One could try to cut that access off by threatening banks with rescission of their charters if they hold deposits of RFT issuers. We worry that this is precisely the type of draconian response that is most likely to drive RFTs offshore rather than to succeed in removing them from existence. A modified approach would be to enact rules stipulating that Federal Reserve banks can hold deposits with RFT issuers only to the extent that such issuers can offer documentation proving that they are current on payment of Coin Tax.

Banks are not the only intermediaries in these transactions that could be pressured by the government. Centralized cryptocurrency exchanges could not only help in providing information about downstream transfers to regulators,[275] but

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273. *See supra* Section II.B.

274. *See supra* note 25 (discussing the so-called "Operation Choke Point 2.0").

275. *See* Young Ran (Christine) Kim, *Tax Reporting as Regulation of Digital Financial Markets*, 80 WASH. & LEE L. REV. 1181, 1200–15 (2023) (discussing the advantages of tax reporting over other

could aid in the collection of such taxes through withholding.[276] (In the same way that employers report on and withhold from a worker's wage income, a centralized exchange could report on and withhold from a user's RFT transactions.) While cryptocurrency exchanges have also sought to resist regulation, recent successful criminal prosecutions suggest that they can effectively be brought to comply with U.S. laws.[277] Such third-party information reporting and withholding regimes have generally been effective, resulting in high compliance at a small administrative cost to the government.[278]

Regarding regulatory incentives, one could use certain features of the Coin Tax (and related mechanisms) as a carrot.[279] As we will see, the government could use the revenues from the tax to set up a stabilization mechanism to hold the peg of RFTs that begin to depeg for reasons traceable to liquidity. Critically, this regulatory backstop could be restricted to RFT issuers who are current with Coin Tax payments (and other regulatory requirements). This stabilization mechanism would clearly hold value for the issuers and users of a particular RFT. This should open up space for the government to assess Coin Tax without thereby simply driving RFT issuers to move offshore and to collateralize with non-dollar assets—as the EU's MiCAR regulations have done with stablecoin issuers such as Tether.[280]

The above carrot-and-stick mechanisms contemplate compliance by the RFT issuer. This is an easier administrative problem to solve than imposition of Coin Tax on downstream transfers for a few obvious reasons. First, the identity of the taxpayer in the case of issuance is readily identifiable and single. By contrast, downstream Coin Tax would have to be assessed with respect to a multitude of actors—and often in cases that might be genuine peer-to-peer transfers with no imposition of an exchange or intermediary. That being said, a majority of RFT holders do use an intermediary when trading.[281] Second, the issuer of the RFT is the party who needs access to the Federal Reserve system in order to have a place to hold reserves. This allows for regulatory pressure that is not present in the case of downstream transfers. In spite of these distinctions, we think that a downstream Coin Tax could be implemented. Much would depend on the rate. Consumers are very accustomed to paying relatively small service fees in the financial context (consider ATM withdrawal fees or price penalties for paying with credit cards rather than cash). A relatively small downstream Coin Tax is thus unlikely to have would-

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forms of information reporting and commenting on the feasibility of tax reporting by financial asset users and intermediaries).

276. *Id.* at 1206–07.

277. *See, e.g.*, *Binance and CEO Plead Guilty to Federal Charges in $4B Resolution*, DEP'T OF JUSTICE (Nov. 21, 2023), https://www.justice.gov/opa/pr/binance-and-ceo-plead-guilty-federal-charges-4b-resolution [perma.cc/RLG8-P78M].

278. *See* Kim, *supra* note 275.

279. *See infra* Section III.C.3.

280. *See supra* note 6.

281. *See* Yiming Ma, Yao Zheng, & Anthony Lee Zhang, *Stablecoin Runs and the Centralization of Arbitrage* 1 (June 2023) (unpublished manuscript), https://www.ecb.europa.eu/press/conferences/shared/pdf/20231109_money_markets/Ma_paper.en.pdf [perma.cc/H2EE-JLAE].

be users of RFTs flee for some token that is collateralized with an asset other than the U.S. dollar. It also seems possible to explore leveraging the technical advantages of the blockchain and smart contracts in this context.[282] For example, the issuer of the RFT is the party who initially creates the protocol on which the RFT runs. It should be possible therefore to use the type of regulatory leverage noted above with respect to the issuer to steer design of the RFT into a realm where collection of downstream Coin Tax is baked in from the beginning. For example, a regulatory regime could condition access to the Federal Reserve system or to a governmental stabilization mechanism on the existence of a smart contract feature that assesses some relatively small levy (perhaps automatically credited to the Fed) upon each transfer of an RFT from one wallet to another.

C. Pigouvian Taxation: Some Modifications

As described below, the Coin Tax is a transactional tax on RFTs which would apply to its issuance and possibly to its downstream transfer among users as well. At a high level of abstraction and as just described, the tax calls to mind Pigouvian taxes, which are used to correct negative externalities. Our proposal is thus in the spirit of Pigouvian taxation. However, given the particular dynamics behind the externality that we are targeting (i.e., financial contagion), our Coin Tax differs in some key respects with typical Pigouvian taxes.[283] Such differences will become relevant in the tax's implementation. In this section, we simply lay out some key distinctions between a classic Pigouvian tax and what we envision for the Coin Tax and modifications that we see as necessary for its effectiveness.

1. Quantity

The basic premise underlying Pigouvian taxation is that, in the absence of a market corrective, private suppliers will take account of only private cost rather than the sum of private and social cost, thus yielding an *excess* of production in equilibrium from a social perspective.[284] Recall our previous example about an industrialist producing paper through a process that pollutes a nearby village's water source.[285] The corrective Pigouvian tax in that scenario would impose a tax on the industrialist equal to the social cost imposed by his production, forcing him to internalize the social costs of his production. In doing so, the tax might change the way the industrialist operates (from a dirty production method that pollutes to a clean production method that does not) and will generally reduce the amount of paper that the industrialist makes.

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282. *See* Young Ran (Christine) Kim, *Blockchain Initiatives for Tax Administration*, 69 UCLA L. REV. 240, 284–95 (2022).

283. In that way, our tax could be seen as a "modified" Pigouvian tax. Modified in the sense that the tax, while corrective of an externality, cannot fully eradicate the externality due to the prisoner's dilemma dynamics behind it, but can significantly reduce such an externality.

284. *See* PIGOU, *supra* note 36, at 192–93 (describing situations where social costs and private costs diverge).

285. *See supra* notes 229–233 and accompanying text.

There is a seemingly universal feature to such Pigouvian taxation that transcends the wide variety of subject matter over which such taxes might be levied. In particular, such taxation is premised on curtailing the equilibrium quantity of some good or service by raising the producer's costs[286]—in our example, dirty production of paper. Thus, a Pigouvian tax on tobacco should result in less tobacco production (and consumption).[287] A Pigouvian tax on carbon emissions should result in fewer carbon emissions.

We would generally expect our Coin Tax to reduce the quantity of RFTs issued and transacted. However, applying this basic feature of Pigouvian taxation to a Coin Tax on RFTs presents a caveat: It is not clear that the nature of the problem with RFTs is that, in the uncorrected market, RFTs will have a market capitalization of $\$x$ that is uninsured, whereas the efficient social equilibrium is to have a market capitalization of some $\$x$–$\$y$ of uninsured "deposits." It is true that if the market capitalization of these uninsured RFTs were to remain small enough, then the risk of systemic contagion likely approaches zero, as they will be too small to cause contagion to other parties.[288] But it is also the case that *any* amount of uninsured risk can yield the basic prisoner's dilemma sketched in the Diamond-Dybvig model. You cannot dissolve a prisoner's dilemma simply by scaling down the payoffs to the parties: There might be fewer parties with smaller deposits at stake, but they will still have an incentive to run. Thus, a straight Pigouvian tax is not an obvious (or complete) solution to a prisoner's dilemma. In other words, the Coin Tax will reduce the size of the RFT market, therefore reducing the potential likelihood and magnitude of contagion to third parties; however, the Coin Tax by itself will not eliminate the potential for financial contagion because depositors might still panic and run. We explore ways to eliminate the underlying dynamics in the next section, where regulators are set on pursuing that as a worthy policy goal.

2. Use of Revenues & Stabilization Mechanism

In principle, if one sets a Pigouvian tax at precisely the correct level (thereby causing the supplier to confront all social cost as well as private cost[289]), then equilibrium output will be efficient, and one would not need to call upon the funds raised by the tax to address the underlying problem that is the target of Pigouvian tax in the first place—here, runs on RFTs.[290] As we have just seen, though, the Coin

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286. *See* JONATHAN GRUBER, PUBLIC FINANCE AND PUBLIC POLICY 134–35 (4th ed. 2013).

287. *But see* Fleischer, *supra* note 235, at 1707–08.

288. *Cf.* FIN. STABILITY BD., ASSESSMENT OF RISKS TO FINANCIAL STABILITY FROM CRYPTO-ASSETS 11–15 (2022), https://www.fsb.org/wp-content/uploads/P160222.pdf [perma.cc/U7AU-QZ9T] (discussing the financial stability contagion effects from stablecoin and assessing their significance based on the size and interconnectedness of these coins).

289. *But see supra* note 234 (discussing the optimal tax debate as to the appropriate rate for a Pigouvian tax in a world already distorted by an income tax).

290. There is a long-running debate in the literature on environmental taxation whether one can achieve a "double dividend" by using the funds from environmental taxation to reduce other (distortionary) fiscal instruments such as income taxes. *See, e.g.*, Antonio M. Bento, *Environmental Policy and the Double Dividend Hypothesis*, OXFORD ENVIRONMENTAL SCI. (Mar. 20, 2024), https://oxfordr

Tax would not be expected to produce some equilibrium amount of RFT issuance and trading that would thereby *completely* remove the underlying problem of contagion risk; rather, the Coin Tax is expected to reduce the size of the market and mitigate the expected costs of contagion. In such a case, a problem remains to be solved (that is, the basic prisoner's dilemma under the Diamond-Dybvig model), and it may be possible to draw upon the very resources generated by the tax in order to remediate such problem. To fully *resolve* this problem, we need some coordinating or bonding mechanism that can eliminate depositors' incentives to run, such as deposit insurance. We need purchasers of RFTs *not* to seek redemption based on, for example, incomplete information about other RFT holders' redemption preferences or about the issuer's balance sheet. The complication is that we have ruled insurance out as a mechanism to achieve this.

In the absence of insurance claim administration, we think the best (and perhaps only) feasible option is some commitment by the sovereign that imposes the Coin Tax to support the RFT.[291] This would not be through insurance, but would, like insurance, involve a mechanism that would eliminate the incentive to run.

We envision two main possibilities. First, the government could use the funds to start an emergency lending scheme similar to an LOLR scheme[292] (even though the issuer is not assumed to participate in the Federal Reserve system for the reasons described above).[293] This should dissolve the prisoner's dilemma by credibly indicating to RFT holders that their RFTs will not suffer from a liquidity-driven solvency crisis. Funds from the Coin Tax could be used for the purpose of funding this LOLR scheme. (This is not essential, but it could bolster the credibility of the government's commitment to have funds preset for this purpose.) Much like FDIC funds, if the scheme works correctly, then one does not actually ever have to call upon funds for cases of insolvency that have been fueled by illiquidity.

Such a scheme could be designed to alleviate the credible and relevant concerns about moral hazard arising from any LOLR scheme.[294] First, the government would not lend to RFT holders that are obviously[295] insolvent, rather

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e.com/environmentalscience/display/10.1093/acrefore/9780199389414.001.0001/acrefore-9780199389414-e-400#/ [perma.cc/8BJD-SSJ5]

We do not enter that debate here. The point in the text is simply that an optimally set Pigouvian tax should produce an equilibrium quantity such that revenues from the tax do not need to be used to address negative externalities from the regulated behavior, which have already been properly priced through the mechanism of the tax. How we should measure the ultimate use and benefit of revenues raised is a separate issue, one that we address separately.

291. Others have proposed similar "joint ventures" between the government and certain digital asset issuers. *See, e.g.*, Schwarcz, *supra* note 7, at 1068–70.

292. As a legal authority matter, this would be best accomplished through the passage of a new statutory framework setting up the rules for when different RFTs would be supported through the scheme.

293. *See supra* Section II.B.

294. These maxims generally follow Bagehot's classical recommendations for a LOLR scheme. *See* Allan H. Meltzer, *Financial Failures and Financial Policies*, *in* DEREGULATING FINANCIAL SERVICES: PUBLIC POLICY IN FLUX 83–85 (George Kaufman & Roger Kormendi eds., 1986) (summarizing Bagehot's classical recommendations into five principles). *See also* Fischer, *supra* note 121, at 86–92 (citing Meltzer's summary of Bagehot and discussing the five principles).

295. Because establishing insolvency in these cases is complicated and information-costly, as

letting them fail or be acquired by the market, thereby reducing the expected private returns of excessive risk-taking by RFT holders (i.e., why not invest in risky projects if the government will bail me out?).[296] Second, the government would lend only on good collateral, marketable in normal times. Such a requirement would ensure that the government lends to firms that might be experiencing second-order insolvency (i.e., insolvency because of illiquidity).[297] Additionally, it will further incentivize firms to invest in collateral that is acceptable by the government, which allows the government to indirectly nudge firms into making less risky investment decisions.[298] Third, the government should indicate that large loans will be made quickly, yet they will have a penalty interest rate. Such a rate accomplishes several things: (i) it prevents RFT issuers that do not need the funds from borrowing;[299] (ii) it reduces the expected private-benefit of borrowing, thus reducing moral hazard; and (iii) it will serve as a credible signal to the market of the RFT issuer's financial strength, thereby alleviating concerns about stigma.[300] Lastly, the lending could be announced to the market with a lag, therefore reducing the possible market reaction to the "stigma" of borrowing from an LOLR scheme.[301]

A second option would be a governmental commitment to maintain the value of the RFT through direct purchase.[302] That is, the government would maintain some commitment to purchase the RFT if it were to begin to depeg, which would be the predictable sign of concerns about a run. As with the lending scheme, Coin Tax revenues could be used to fund this stabilization mechanism, which would

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we have seen, and liquidity issues can create solvency issues, see supra Section I.B, a properly designed LOLR scheme should lend on all possible good collateral that is marketable in the ordinary course of business. Such an expansive view should allow the lender to prop up firms that are either insolvent or on the verge of insolvency because of liquidity issues. *See* Fischer, *supra* note 121, at 90.

296. This follows restrictions otherwise found in LOLR (and bailout) schemes. *See, e.g.*, Federal Reserve Act, § 13(3)(B)(ii) ("The Board shall establish procedures to prohibit borrowing from programs and facilities by borrowers that are insolvent."). *See also* Fischer, *supra* note 121, at 88–91 (citing Meltzer's summary of Bagehot and discussing the five principles).

297. *See supra* note 281.

298. *See* Fischer, *supra* note 121, at 90. However, in designing such a list, the government should be weary of unduly narrowing RFT issuer's portfolio choices, as such restrictions tend to increase risk-taking by the regulated and can increase financial stability in the chosen "good collateral" assets. *See* Gorton & Zhang, *supra* note 7, at 954–55.

299. *See* Fischer, *supra* note 121, at 90–91.

300. *See* Celine Gauthier et al., *Emergency Liquidity Facilities, Signaling, and Funding Costs* (Bank of Can., Staff Working Paper No. 2015-44, 2015), https://www.bankofcanada.ca/wp-content/uploads/2015/12/wp2015-44.pdf [perma.cc/8779-RLZZ] (arguing that the TAF's higher cost of lending than discount window lending was a positive signal of a bank's solvency, allowing banks to borrow from the TAF without concerns about stigmatization); ALAN S. BLINDER, A MONETARY AND FISCAL HISTORY OF THE UNITED STATES, 1961-2021, at 258 (2022) (discussing how banks used the Fed's Term Auction Facility during the Great Recession to access emergency liquidity despite the stigma of doing so because the TAF was open to all banks regardless of solvency, thus taking a loan was not a specific signal of a bank's distress, and because the loans were paid with a delay, signaling that the borrowing bank was not in immediate need for liquidity).

301. *See supra* note 294.

302. We acknowledge that the empirical evidence on the effects of central banks' currency exchange operations is mixed. For a recent study on their effectiveness, see Alain Naef, *Blowing Against The Wind?*, J. INT'L MONEY & FIN., Aug. 2024, at 1.

make it more credible. To assuage moral hazard issues, the government could *ex ante* commit to not purchase RFTs where depegging arises due to first-order insolvency.[303] Drawing this line imposes an informational burden on the government—but one, we think, that is lower than the administration of a full-fledged insurance scheme over regulated bank actors. Furthermore, limitations communicated *ex ante* about when the government would support an RFT issuer's peg (e.g., only when the issuer has informed the government that it has appropriate collateral, only when the issuer has complied in good faith with all of its Coin Tax obligations) can be designed to further reduce the problem of moral hazard by RFT issuers.

A side benefit of establishing a stabilization mechanism is that the government gains some leverage over the RFT issuer. Recall that a significant concern over the widespread adoption of an RFT as an alternative everyday currency is the government's concomitant loss over monetary policy:[304] If Amazon were to mint most of the money that people use, as in our example, the Federal Reserve might lose effective control over the money supply. Setting up a stabilization mechanism would provide the government with a carrot to entice RFT issuers into joining a collaborative framework on monetary policy, where RFT issuers would generally follow the Fed's lead in increasing or decreasing the money supply when needed.[305] As such, the stabilization mechanism would not only assist in creating a more stable and better-regulated environment for RFTs (and their users), but would also ensure that the government retains its primacy over monetary policy.

D. Advantages of Tax Instruments Relative to Alternative Instruments

1. Incidence

Unlike other policy measures, a Coin Tax would target the conduct at hand by directly imposing a tax on the activity generating the negative externality (i.e., the risk of broad financial contagion from the use of risky RFTs). Bailouts and LOLR schemes, for example, impose such costs on taxpayers by using taxpayer money to provide extra liquidity to endangered banks. For their part, contractual breakers impose a cost on both banks and depositors. They do so in an indirect fashion: After depositors and banks adapt and incorporate into their expectations the costs of the possible suspension of the convertibility of their deposits, the costs of deposits go up. Such costs are split between banks and depositors.

Public insurance in the United States is a combination of the above—with costs spread over banks, depositors, *and* taxpayers. Public insurance nominally works by charging banks for insurance (with insurance premiums that are now designed to mirror such bank's risk). Such costs can be expected to at least be partly

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303. The term "first-order" here meaning that the insured harm is insolvency that is not causally induced by illiquidity.

304. *See supra* notes 184–186.

305. This resembles the joint venture Schwarcz proposes yet crucially diverges in both the type of carrot offered by the government and the type of regulatory instrument used to make RFTs safer (taxation). *See* Schwarcz, *supra* note 7, at 1068–70.

passed on to depositors. However, the FDIC provides *unconditional* guarantees. Were there not to be enough from the FDIC's operations to guarantee certain deposits, the public fisc would have to cover those extra expenses. Such a situation is not far-fetched or speculative: The FDIC estimates to lose money in several of the transactions it undertook to save several banks during the March 2023 banking panic. Although those costs are later recouped from higher insurance premiums on banks, or special assessments, they can take long to recoup, with taxpayers providing the funding until these funds are repaid.[306]

A Coin Tax would impose the costs associated with the prevention of bank runs on the actors that should bear them: (i) the issuers of such coins (in the standard banking model, banks) and (ii) the users of such a system. It would not impose costs on taxpayers or other parties. As a result, the Coin Tax's incidence is preferable in terms of efficiency and fairness. A standard maxim in economics is that externalities should be borne by the actors generating them, and that a move towards making them internalize these costs is an efficient move. The costs of preventing financial contagion through traditional policies (by providing emergency liquidity, by halting a run, or by insuring deposits) are either (i) imposed on parties that should not bear them because they do not generate such externality (e.g., taxpayers) or (ii) imposed not broadly enough, ignoring the costs that other parties (e.g., depositors, trading partners) impose on the system. A Coin Tax on RFTs resolves these incidence issues, as it imposes costs on the actors who generate the risk of financial contagion: the issuers of such risky RFTs and actors who transact using RFTs.

2. Jurisdiction

A second advantage of a Coin Tax on RFTs over traditional forms of regulation—including most notably public insurance—is that of clear regulatory authority and jurisdiction. Currently, RFTs are notorious for their lack of regulation.[307] This lack of regulation is not merely a consequence of their technological novelty or of a lack of regulatory appetite. Rather, it reflects the difficulty of asserting regulatory authority and jurisdiction over novel assets that are often issued in opaque offshore financial centers and traded online, frequently across jurisdictions—and then ensuring harmonic coordination among jurisdictions.[308]

Our tax sidesteps those problems because taxing jurisdiction is clearly and easily established: U.S. persons[309] (including U.S.-based RFT issuers) will pay Coin Tax on their transactions. The United States currently asserts worldwide taxing

306. For example, to fund its deposit insurance fund, the FDIC sold two sets of notes to the Federal Financing Bank, Treasury's vehicle to lend to agencies, for $93.3 billion. The FDIC is expected to pay for those in 2028 and 2033. *See* CONG. BUDGET OFF., FDIC DEPOSIT INSURANCE FUND (June 2024), https://www.cbo.gov/system/files/2024-06/60394-2024-06-fdic.pdf [perma.cc/JH4M-NKJE].

307. *See supra* note 41.

308. *See supra* Section I.B (discussing the problems of seeking to bring RFTs into the public insurance pool and the banking regulatory perimeter). *See* Schwarcz, *supra* note 7, at 1074.

309. *See* I.R.C. § 7701(a)(30) (West).

jurisdiction over U.S. persons, so the Coin Tax would not represent an extraordinary assertion of U.S. regulatory authority—unlike the forceful inclusion of foreign-based RFT issuers within the U.S. banking regulatory perimeter based on very attenuated connections to the U.S. market.[310] Moreover, unlike banking law definitions, which have been historically formalistic,[311] the definition of U.S. person can be more functional, potentially adapting to strategic moves by RFT issuers to avoid regulatory jurisdiction.[312]

3. Administrability & Implementation

A third advantage of a Coin Tax on RFTs over traditional forms of regulation is well documented in the law-and-economics literature: Taxes are generally easier to implement and administer and are less costly to the government than other forms of regulation. An extensive literature in economics argues that Pigouvian taxes are more efficient than command-and-control (or quantity) regulation.[313] Taxes impose fewer informational costs on the government, are less likely to be distortionary than regulatory options, and tend to be more inducive to technological innovation. As a result, economists (and law and economics scholars) have a general preference of taxes over regulation.[314]

An additional administrative advantage is that taxes are relatively more adjustable. That is, regulation of digital assets has often proven all-or-nothing: China bans cryptocurrencies; El Salvador embraces Bitcoin as legal tender.[315] Striking a middle regulatory stance that reflects policymakers' beliefs about the costs and benefits of new types of money will be a herculean task—especially if the social welfare calculations on these instruments evolve as innovative features produce new benefits (and costs). Unlike complex regulatory schemes, tax rates can be easily raised or lowered, allowing policymakers to adapt the Coin Tax to changes in the underlying risks posed (and benefits created) by RFTs. At the same time, a tax instrument retains policymakers' ability to effectively squelch RFTs through the imposition of high Coin Tax rates, where policymakers convinced that there is negative social value to their use.

Furthermore, unlike with other regulatory regimes, Coin Taxes face fewer legal hurdles to their implementation than traditional banking law instruments. The

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310. *See supra* notes 169–175 and accompanying text.

311. *See generally* RICKS, *supra* note 39 (criticizing banking law's formalism).

312. *Cf.* Treas. Reg. § 301.7701(b)-1 (1992).

313. For accounts arguing for the superiority of corrective taxes over command-and-control regulation, see, for example, Louis Kaplow & Steven Shavell, *On the Superiority of Corrective Taxes to Quantity Regulation*, 4 AM. L. & ECON. REV. 1, 2 (2002); Martin L. Weitzman, *Prices vs. Quantities*, 41 REV. ECON. STUD. 477, 477 (1974). For a discussion of banking regulation as command-and-control regulation, see, for example, Mark J. Roe & Michael Troge, *Containing Systemic Risk by Taxing Banks Properly*, 35 YALE J. REG. 181, 189–193 (2018).

314. *See* Masur & Posner, *supra* note 228, at 95.

315. *See* Fernando E. Alvarez et al., *Are Cryptocurrencies Currencies? Bitcoin as Legal Tender in El Salvador* (Nat'l Bureau of Econ. Rsch., Working Paper No. 29968, 2023), https://www.nber.org/system/files/working_papers/w29968/w29968.pdf [perma.cc/GK2C-W3WK].

Constitution provides few restrictions on the levying of excise taxes like ours.[316] That, plus the ease of using the reconciliation process to pass tax legislation (of special importance in an era of partisan legislation), makes taxation a preferable regime from a legal implementation perspective.[317]

CONCLUSION

We are very likely stuck in a wild new financial world where private actors create novel types of money and do so in an effectively unregulated (or at least significantly underregulated) fashion. More worrisomely, despite their ingeniousness and novelty, these new instruments (from stablecoins to our hypothetical Bezos) suffer from traditional banks' perennial vulnerability to bank runs. However, our tried-and-true policy mechanisms to prevent runs—from public deposit insurance to suspension of convertibility schemes—do not work well for these novel instruments. This is not a reason for crypto schadenfreude: the failure of RFTs poses potential risks to everyone.

So, if we are right about the future, what are we to do? Our Article offers a novel alternative to current regulatory approaches: a Coin Tax. Our Coin Tax would impose the costs of contagion risks on RFT issuers and users, therefore forcing these actors to internalize the social costs of their actions. The Coin Tax thus promises to significantly reduce the likelihood and magnitude of financial contagion from RFTs. Its effectiveness, however, will depend on its design and implementation. We explore those issues and offer guidance to policymakers on how to more effectively implement our Coin Tax and highlight where further empirical research is needed to optimize its design and implementation. Perhaps more importantly, the Coin Tax illustrates the way in which other areas of the law can provide alternative—and sometimes superior—regulatory instruments to regulate banking institutions. Such alternatives highlight both scholars' responsibility to engage with other areas of the law to identify such alternative instruments and policymakers' attention to these new tools, which could be effectively used to regulate other activities that are hard to reach or regulate such as shadow banking and the private credit markets.

316. *See* Veazie Bank v. Fenno, 75 U.S. 533, 541 (1869).
317. *See* Salibo, *supra* note 229.