
MONEY AND THE PUBLIC DEBT: TREASURY MARKET LIQUIDITY AS A LEGAL PHENOMENON

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The market for U.S. government debt (Treasuries) forms the bedrock of the global financial system. The ability of investors to sell Treasuries quickly, cheaply, and at scale has led to an assumption, in many places enshrined in law, that Treasuries are nearly equivalent to cash. Yet in recent years Treasury market liquidity has evaporated on several occasions and, in 2020, the market's near collapse led to the most aggressive central bank intervention in history.

This Article pieces together what went wrong and offers a new account of the relationship between money issue and debt issue as mechanisms of public finance. It argues that a high degree of convertibility between Treasuries and cash generally requires intermediaries that can augment the money supply, absorbing sales by expanding their balance sheets on both sides. The historical depth of the Treasury market was in large part the result of a concerted effort by policymakers to nurture and support such balance sheet capacity at a collection of nonbank broker-dealers. In 2008, the ability of these

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intermediaries to augment the money supply became impaired as investors lost confidence in their money-like liabilities (known as repos). Subsequent changes to market structure pushed substantial Treasury dealing further beyond the bank regulatory perimeter, leaving public finance increasingly dependent on high-frequency traders and hedge funds—“shadow dealers.” The near money issued by these intermediaries proved highly unstable in 2020. Policy makers are now focused on reforming Treasury market structure so that Treasuries remain the world’s most liquid asset class. Successful reform likely requires a legal framework that, among other things, supports elastic intermediation capacity through balance sheets that can expand and contract as needed to meet market needs.

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I. INTRODUCTION

It is a longstanding principle of American public finance that when the government spends more than it takes in, it does not cover that gap by printing new money. Instead, it sells “Treasury securities,” or “Treasuries.” Treasuries are a type of tradeable debt obligation backed by the “full faith and credit” of the United States. Although primarily an instrument for managing fiscal policy, over time, Treasuries have taken on additional functions. Today, they are the foundation of global capital markets—the benchmark against which investors price trillions of dollars of securities and financial derivatives. Treasuries are also an important component of the dollar-based global trading system and the reserve asset of choice for foreign governments.¹ Demand for Treasuries abroad is a “national security issue,”² given how the U.S. uses the dollar’s dominant position in cross-border capital flows and trade to advance its geopolitical goals.³

¹ Of the roughly \$17.6 trillion in marketable debt outstanding as of March 2023, *see* U.S. Dep’t of the Treasury, Monthly Statement of the Public Debt of the United States (Apr. 2022), 43% is held abroad, including 22% by foreign central banks, *see* U.S. Dep’t of the Treasury, Major Foreign Holders of Treasury Securities (Mar. 2022), making up 32% of their overall reserves and 57% of U.S. dollar reserve assets, *see* *Currency Composition of Official Foreign Exchange Reserves (COFER)*, INT’L MONETARY FUND (Mar. 2022), <https://data.imf.org/?sk=E6A5F467-C14B-4AA8-9F6D-5A09EC4E62A4> [<https://perma.cc/3HHS-ELD8>]. Marketable debt excludes Treasuries owned directly by the Federal Reserve, of which there were \$5.3 trillion in March 2023. Fed. Rsrv. Bank of St. Louis, *Securities Held Outright: U.S. Treasury Securities*, FED. RSRV. ECON. DATA (Mar. 30, 2023), <https://fred.stlouisfed.org/series/TREAST> [<https://perma.cc/5YMX-645Q>].

² PAUL TUCKER, GLOBAL DISCORD: VALUES AND POWER IN A FRACTURED WORLD xii (2022); Adam Samson, Robin Wigglesworth, Colby Smith & Joe Rennison, *Strains in US Government Bond Markets Rattle Investors*, FIN. TIMES, Mar. 12, 2020.

³ *See, e.g.*, REBECCA NELSON, CONGR. RSCH. SERV., IF12092, THE ECONOMIC IMPACT OF RUSSIA SANCTIONS 1 (2022); *see also* Emine Boz Camila Casas, Georgios Georgiadis, Gita Gopinath, Helena Le Mezo, Arnaud Mehl & Tra Nguyen, *Patterns in Invoicing Currency in Global Trade* (Int’l Monetary Fund, Working Paper No. 20/126, July 17, 2020), <https://www.imf.org/en/Publications/WP/Issues/2020/07/17/Patterns-in-Invoicing-Currency-in-Global-Trade-49574>. The international role of the

It has therefore come as a shock to many that the market for Treasury securities—the “deepest and most liquid in the world”⁴—has faltered repeatedly since late 2008.⁵ When sellers of Treasuries are not able to find buyers cheaply and easily, it increases the cost of public finance, impairs the ability of the private sector to price risk and allocate capital, and reduces the global appeal of the dollar as a means of payment and store of value. In March of 2020, as the COVID-19 pandemic spread, Treasury markets became so impaired that simple transactions were difficult (if not impossible) to execute.⁶ Prices dropped rapidly even as investors moved toward, not away from, low-risk assets. A financial crisis loomed. To prevent what some warned could be a catastrophe rivaling the 2008 collapse,⁷ the U.S. monetary authority, the Federal Reserve (the “Fed”), intervened with a massive

dollar gives the U.S. a unique position in global financial networks that can in principle be used as a tool of coercion, or “weaponized interdependence.” Henry Farrell and Abraham L. Newman, *Weaponized Interdependence: How Global Economic Networks Shape State Coercion*, *International Security*, Vol. 44, No. 1 (Summer 2019), at 42–79. That is true not only of U.S.-based banking services but the Eurodollar system as well. *See, e.g.*, John E. Hoffman, Jr. and Ian H. Giddy, *Lessons from the Iranian Experience: National Currencies as International Money*, *Journal of Comparative Corporate Law and Securities Regulation* 3 (1981) at 275.

⁴ Lorie K. Logan, Exec. Vice President, Fed. Rsrv. Bank of N.Y., *The Federal Reserve’s Recent Actions to Support the Flow of Credit to Households and Businesses*, Remarks before the Foreign Exchange Committee, Federal Reserve Bank of New York (Apr. 14, 2020), <https://www.newyorkfed.org/newsevents/speeches/2020/log200414> [<https://perma.cc/VB8Q-G22Z>] (“The market for U.S. Treasury securities is commonly described as the deepest and most liquid in the world.”).

⁵ A market is deep and liquid when buyers and sellers can quickly and cheaply transact in size without a significant change in the price. Liquidity can often be in the eye of the beholder—to borrow a phrase from Justice Potter Stewart, we know it when we see it.

⁶ JORDAN BARONE, ALAIN CHABOUD, ADAM COPELAND, CULLEN KAVOUSSI, FRANK M. KEANE & SETH SEARLS, FED. RSRV. BANK OF N.Y., STAFF REPORTS NO. 1010, *THE GLOBAL DASH FOR CASH: WHY SOVEREIGN BOND MARKET FUNCTIONING VARIED ACROSS JURISDICTIONS IN MARCH 2020* (2022).

⁷ *See, e.g.*, Adam Tooze, *2020 Was Almost Worse Than 2008*, ATLANTIC (Sept. 6, 2021), <https://www.theatlantic.com/politics/archive/2021/09/adam-tooze-shutdown-2020-crash/619982/> [<https://perma.cc/V6F7-RQVB>].

program of “market functioning purchases.” It bought more than \$2 trillion of Treasuries and offered to finance trillions more as part of an unprecedented and open-ended commitment to stabilize the market.⁸ Although the effort was successful, it raised questions about the line between money and debt issue as mechanisms of public finance, and whether there in fact was one at all.

Determined to reduce the likelihood of such direct interventions in the future,⁹ academics¹⁰ and policymakers¹¹ are now considering numerous reforms. These include measures to modify or recalibrate bank regulations, improve market infrastructure and “plumbing,” and enhance transparency.¹² Each would, to varying degrees, tend to

⁸ MICHAEL FLEMING, HAoyang LIU, RICH PODJASEK & JAKE SCHURMEIER, FED. RSRV. BANK OF N.Y., *THE FEDERAL RESERVE’S MARKET FUNCTIONING PURCHASES* (2021).

⁹ Lorie Logan, President of the Federal Reserve Bank of Dallas and former manager of the Federal Reserve System Open Market Account, recently observed, “The public and private sectors must work together to enhance market resilience so that these episodes will be far less frequent going forward. And, to be prepared for those rare occasions when extreme stresses in core markets threaten financial stability or the macroeconomy, central banks must continue to develop the toolkit for mitigating dysfunction.” Lorie K. Logan, President of the Fed. Rsrv. Bank of Dallas, *Preventing and Responding to Dysfunction in Core Markets*, Remarks at the Workshop on Market Dysfunction at the University of Chicago Booth School of Business (Mar. 3, 2023), <https://www.dallasfed.org/news/speeches/logan/2023/lkl230303> [<https://perma.cc/6N6Q-LMXW>].

¹⁰ See, e.g., Yesha Yadav, *The Failed Regulation of U.S. Treasury Markets*, 121 COLUM. L. REV. 1173 (2021); Nellie Liang & Patrick Parkinson, *Enhancing the Liquidity of U.S. Treasury Markets Under Stress*, Brookings Blueprints for American Renewal & Prosperity (Dec. 16, 2020), <https://www.brookings.edu/research/enhancing-the-liquidity-of-u-s-treasury-markets-under-stress/> [<https://perma.cc/XS4S-MURY>].

¹¹ See, e.g., John C. Williams, President and Chief Exec. Officer, Fed. Rsrv. Bank of N.Y., *Preparing for the Unknown*, Remarks at the 2021 U.S. Treasury Market Conference (Nov. 17, 2021), <https://www.newyorkfed.org/newsevents/speeches/2021/wil211117> [<https://perma.cc/87D6-UNP2>].

¹² See, e.g., Yesha Yadav, *The Failed Regulation of U.S. Treasury Markets*, 121 COLUM. L. REV. 1173 (2021); Nellie Liang & Patrick Parkinson,

increase and stabilize liquidity. Determining which would have the most significant and lasting effect, however, requires correctly diagnosing what went wrong. Why did the market break down in 2020? Why does liquidity remain relatively low today? And why, by contrast, was the market so deep and liquid in previous decades?

This Article offers answers to these questions grounded in a historical account of the market's origins and development. It argues that American public finance has long been closely intertwined with the American monetary framework and that deep and liquid Treasury markets are, in large part, a legal phenomenon. Treasury market liquidity, in other words, did not arise organically as a product primarily of private ordering. Instead, it was actively constructed by government officials. The high degree of convertibility between Treasury securities and cash—the market's "liquidity"—depends upon entities that can create new, money-like claims to buy Treasuries. Sometimes the government's central bank has issued these claims directly, as in March 2020; other times these claims were issued by central bank-backed instrumentalities, such as banks and select broker-dealers.¹³

Enhancing the Liquidity of U.S. Treasury Markets Under Stress, BROOKINGS (Dec. 16, 2020), <https://www.brookings.edu/research/enhancing-the-liquidity-of-u-s-treasury-markets-under-stress/> [<https://perma.cc/XS4S-MURY>]; U.S. DEP'T OF THE TREASURY, BD. OF GOVERNORS OF THE FED. RSRV. SYS., FED. RSRV. BANK OF N.Y., SEC, CFTC, ENHANCING THE RESILIENCE OF THE U.S. TREASURY MARKET: 2022 STAFF PROGRESS REPORT, <https://home.treasury.gov/system/files/136/2022-IAWG-Treasury-Report.pdf> [<https://perma.cc/4JFS-UQ5U>]; U.S. DEP'T OF THE TREASURY, BD. OF GOVERNORS OF THE FED. RSRV. SYS., FED. RSRV. BANK OF N.Y., SEC, CFTC, RECENT DISRUPTIONS AND POTENTIAL REFORMS IN THE U.S. TREASURY MARKET: A STAFF PROGRESS REPORT (2021), <https://home.treasury.gov/system/files/136/IAWG-Treasury-Report.pdf> [<https://perma.cc/FJB7-YQC8>].

¹³ Accordingly, we agree in part with (and attempt to elaborate on and validate herein) the claim by Modern Monetary Theorists that the U.S. government, in an important sense, money-finances its spending. See STEPHANIE KELTON, *THE DEFICIT MYTH: MODERN MONETARY THEORY AND THE BIRTH OF THE PEOPLE'S ECONOMY* 120–21 (2020); Nathan Tankus, *The Federal Government Always Money-Finances Its Spending: A Restatement*, SUBSTACK: NOTES ON THE CRISES (Jun. 30, 2020),

Either way, it has taken extensible, money-financed balance sheet capacity to give Treasuries their cash-like properties.

This Article proceeds in four parts. Parts II through IV examine the relationship between money and the public debt. They show how, for most of its history, the U.S. has structured its monetary system to facilitate the Treasury's ability to sell securities to cover revenue shortfalls. Simply put, the U.S. has long used money issue, not just taxing and borrowing, to support federal finance. To appreciate this monetary-fiscal entanglement, it is necessary first to recognize that the United States has never relied exclusively, or even primarily, on money instruments issued directly by government agencies.¹⁴ Instead, since the Founding, the government has outsourced money augmentation. By design, investor-owned enterprises—typically, chartered banks—have been the predominant money issuers in the economy. And the federal government, recognizing this, has set terms and conditions for their money creation.¹⁵ Many of these strictures relate to the public debt.

Table 1 identifies four distinct legal-institutional configurations, which we distinguish by the type of monetary instrument used to undergird government borrowing and whether monetary support was targeted at primary or

<https://nathantankus.substack.com/p/the-federal-government-always-money> [<https://perma.cc/4AJW-ENQG>]. We also contribute to the existing literature on the government's role in constructing certain financial markets. See Benjamin Braun, Arie Krampf & Steffen Murau, *Financial Globalization as Positive Integration: Monetary Technocrats and the Eurodollar Market in the 1970s*, 28 REV. INT'L POL. ECON. 794 (2021); KATHARINA PISTOR, *THE CODE OF CAPITAL: HOW THE LAW CREATES WEALTH AND INEQUALITY* (2019).

¹⁴ Brian Galle and Yair Listokin, for example, define "monetary financing" as the government's acquiring goods and services in exchange for newly authorized currency. Brian Galle & Yair Listokin, *Monetary Finance*, 75 TAX L. REV. 137, 137–38 (2022). Although Galle and Listokin recognize the role played by non-government actors in augmenting the money supply, they exclude "broad money" from their definition of monetary finance. Here we include broad money as we believe it is a critical source of support for the fiscal state.

¹⁵ Cf. Lev Menand, *Why Supervise Banks? The Foundations of the American Monetary Settlement*, 74 VAND. L. REV. 951 (2021).

secondary markets (the former being where the Treasury initially raises funds, and the latter being where owners of Treasuries sell them to new buyers).¹⁶

Part II covers the first two configurations. Under these arrangements, fiscal-monetary entanglement was relatively transparent. Between 1863 and 1916, Congress established a network of investor-owned federal corporations—national banks—to serve as the country’s primary money-issuing institutions and required that these instrumentalities back their paper notes with Treasuries. At the same time, Congress levied a prohibitively high tax on the notes of state banks, which lacked such charters. In doing so, the federal government conjured captive demand for federal debt. Although, under the resulting legal regime, the government formally borrowed to manage deficits, it borrowed in significant part by selling Treasuries to national banks, which, in turn, funded their purchases with newly issued notes and deposits.

Table 1: Four Fiscal-Monetary Configurations¹⁷

Regime	Dates	Market	Monetary Instrument
1. The National Banking System	1863-1916	Primary	Notes
2. The Federal Reserve System	1916-1951	Primary	Deposits and Reserves
3. The Primary Dealer System	1951-2008	Secondary	Repos
4. Shadow Dealing	2008-2022	Secondary	Repos and Reserves

¹⁶ Other configurations, of course, are possible. For arguments that the government should embrace direct money issue, see Rohan Grey, *Administering Money: Coinage, Debt Crises, and the Future of Fiscal Policy*, 109 KY. L.J. 229 (2020).

¹⁷ CONG. BUDGET OFF., HISTORICAL DATA ON FEDERAL DEBT HELD BY THE PUBLIC (2010); Fed. Rsrv. Bank of Dallas, *Market Value of Marketable Treasury Debt*, FED. RSRV. ECON. DATA (Feb. 15, 2023), <https://fred.stlouisfed.org/series/MVMTD027MNFBRBDAL> [<https://perma.cc/PDJ4-NJG3>]; Ctr. For Fin. Stability, *Resources and Assets: U.S. Government Securities: Bought or Held Outright: Total Bought Outright*, FED. RSRV. ECON. DATA (Feb. 10, 2021), <https://fred.stlouisfed.org/series/RAGSOTBO> [<https://perma.cc/H7KY->

In 1913, Congress established the Fed to administer the investor-owned banking system and issue a new national currency, the paper notes that we use today. Although legislators initially designed the Fed on principles of monetary-fiscal separation, following the entry of the U.S. into World War I, Congress adjusted the law so that the Fed could incentivize banks to purchase Treasuries with newly issued deposits. Under this second configuration, government officials actively managed debt monetization by deposit-creating banks. Less than thirty years later, when the U.S. joined the Allied effort in World War II, the Fed went even further. It bought large quantities of Treasuries directly and administered prices for Treasury debt, pegging short- and long-term Treasury rates using its own balance sheet—monetary finance (arguably a form of “fiscal dominance”¹⁸) even under the conventional view.

In these first two stages, the government ensured that a large proportion of its funding needs were met in the primary market through some combination of direct central bank purchases, commercial bank purchases facilitated by extensions of central bank credit, commercial bank purchases financed by deposit creation or currency issuance, and purchases by non-banks and individuals facilitated by commercial bank extensions of credit. Secondary markets—where investors buy and sell previously-issued securities among each other—played a much less important role. Subsequent regimes, by contrast, reflect a significant shift in strategy: from primary market credit control to secondary market liquidity provisioning. They also involved a change in

HRXC]; Bd. of Governors of the Fed. Rsrv. Sys., *Assets: Securities Held Outright: U.S. Treasury Securities*, FED. RSRV. ECON. DATA (Mar. 2, 2023), <https://fred.stlouisfed.org/series/TREAST> [<https://perma.cc/P6AZ-VTNV>]; U.S. Bureau of Econ. Analysis, *Gross Domestic Product*, FED. RSRV. ECON. DATA (Feb. 23, 2023), <https://fred.stlouisfed.org/series/GDP> [<https://perma.cc/JD8G-HYC4>].

¹⁸ Fiscal dominance refers to a policy configuration in which fiscal concerns determine the size of the money supply, limiting the ability of government officials to use interest rate policy for other purposes.

policy leadership from legislators to administrators, especially central bankers.

Part III describes a pivotal moment in the early 1950s, when Fed officials sought to establish a “free market” in government debt, in large part to counteract inflationary pressures. Officials aimed not just to eliminate administered prices and shrink the central bank balance sheet, but also to use capital markets, rather than the chartered banking system, as a means of placing federal debt with a much broader set of end-investors. As William McChesney Martin, then-Chairman of the Board of Governors of the Federal Reserve System, later put it, the capital markets (and not the banking system) “represent the main channel through which the Government’s financial policies to foster growth and stability must pass.”¹⁹

But the Fed’s turn to capital markets—the beginning of a third stage of monetary-fiscal entanglement—was not just a matter of central bankers exiting and private actors stepping in. It required creative lawyering and ongoing government support. The lynchpin was a form of near-money financing for non-bank dealer firms that the Fed itself developed: a sale-and-repurchase agreement, or “repo.” A repo is economically equivalent to a secured loan but structured as a sale of a bond combined with an agreement to repurchase that bond at an adjusted price on a date specified in advance. When the first and second transaction in a repo are spaced a day apart (and made exempt from the bankruptcy process), repos function (in certain respects) like bank deposits. Dealer firms, therefore, could conduct overnight repo transactions primarily with nonbank corporate “depositors,” effectively money-financing their operations.

To accomplish their goals, the Fed needed to serve only as a backstop to repos—in much the same way as it supports traditional banks and their deposits. Accordingly, the Fed

¹⁹ William McChesney Martin, Chairman of the Bd. of Governors of the Fed. Rsrv. Sys., “The Government Securities Market and Economic Growth,” Statement before the Joint Economic Committee (July 27, 1959), <https://fraser.stlouisfed.org/title/448/item/7840> [https://perma.cc/Y5RN-X84C].

began to use repos to backstop a group of nonbank dealer firms known today as “primary dealers,” which themselves used repos with private sector cash providers to support a highly liquid market in Treasuries. This liquidity, in turn, attracted end-investors by offering them the ability to convert the federal government’s debt cheaply and easily into cash at any time. The Legal Department at the Fed’s Board concluded that the Fed could conduct repos with nonbanks continuously under their authority to purchase and sell government securities in the open market. Doing so allowed the Fed to control the funding costs of government securities dealers, including ensuring that it would be profitable to maintain stable inventories for later sale.

The Fed’s backstop, along with other risk mitigants like haircuts and counterparty selection, greatly enhanced the “moneyness” of repos from the perspective of the cash providers on which the dealers relied day-to-day. As the Federal Reserve Bank of New York later explained, repo was a key element in making Treasuries more attractive to both foreign and domestic investors. Repo-financed liquidity lowered the cost of servicing the nation’s debt and buttressed the foundations of what became known as the global dollar system.²⁰ Meanwhile, the central bank’s hand faded into the background, with the Fed using its balance sheet only intermittently and generally at small scale rather than continuously and as the primary source of dealer funding.²¹

²⁰ Brief for the Federal Reserve Bank of New York as Amici Curiae, In re Lombard-Wall Inc., 23 B.R. 165 (Bankr. S.D.N.Y. 1982), *reprinted in Impact on Money and Credit Policy of Federal Debt Management: Hearing Before the Subcomm. on Domestic Monetary Pol’y of the Comm. on Banking, Fin. and Urb. Aff. of the H.R.*, 98th Cong. 73–74 (1983).

²¹ Here our argument mirrors the argument made in 2020 by Nathan Tankus, who observed that the rise in the amount of Treasuries on the Fed’s balance sheet merely reflected a shift from covert to overt intervention in the Treasury market by the central bank. Nathan Tankus, *The Way People Talk About the Federal Reserve’s “Big” Balance Sheet Is All Wrong*, SUBSTACK: NOTES ON THE CRISES (July 27, 2020) <https://nathantankus.substack.com/p/the-way-people-talk-about-the-federal> [https://perma.cc/UGX9-XDA6] (“[W]hat is the difference between the Federal Reserve requiring a private financial institution to purchase

This arrangement had profound consequences for the U.S. economy and financial system. Deep public debt markets helped dealer firms manage their interest rate risk. That, in turn, facilitated deeper and more liquid capital markets in debt securities issued by corporations and other borrowers. The rise of dealer repo also increasingly crowded out bank deposits. In this way, the events of the 1950s and the transition to a free market in Treasuries catalyzed the growth of “shadow banking,” redirecting vast supplies of corporate cash away from regulated banks.

Ultimately, the result was a multi-trillion-dollar repo market that collapsed in 2008, bringing down many of its key players. In effect, a feature of the primary dealer system—that repo behaved like money in many respects, but was not insured by the government or subject to bank regulation—was revealed to be a bug. Private sector repo was highly runnable, notwithstanding the Fed’s primary dealer repo backstop. A fourth era began—quickly, somewhat chaotically, unheralded, and largely undesigned. One by one, the largest standalone broker-dealers were either acquired by commercial banks, failed, or opened banks and reorganized as bank holding companies. In the span of a few weeks, the bulk of Treasury dealing was pulled back into the banking system broadly defined.²²

Part IV unpacks the resulting market structure. When volatility subsided, the federal government embarked on a comprehensive overhaul of international banking regulations. As part of what became known as Basel III, the U.S. imposed new size-based requirements for banks and bank holding companies, which were agnostic to credit risk.²³ These rules

treasury securities, and ensuring they can borrow against those securities at a target interest rate, and simply *purchasing* a treasury security themselves?”).

²² CECILIA CAGLIO, ADAM COPELAND & ANTOINE MARTIN, FED. RSRV. BANK OF N.Y., *THE VALUE OF INTERNAL SOURCES OF FUNDING LIQUIDITY: U.S. BROKER-DEALERS AND THE FINANCIAL CRISIS* (2021).

²³ For example, the Supplementary Leverage Ratio, or SLR, and its enhanced cousin in the U.S., the eSLR. See 12 C.F.R. pts. 6, 324 (2022). The capital surcharge assigned to global systematically important banking

disincentivized banks and their dealer affiliates from engaging in low-risk activities requiring high levels of leverage to be profitable—among them the intermediation of Treasury markets. The ability of dealers to use their balance sheets elastically to mitigate the price impact of heavy sales and other sources of volatility fell as demand for intermediation increased, along with the overall stock of public debt.²⁴ The pre-crisis framework—which relied on repo-financed dealer firms relatively unencumbered by strict bank-like balance regulations—could no longer generate elasticity under stress.²⁵

But Treasury markets have not entirely dried up for two reasons. First, the Fed has spent much of the past fifteen years engaged in large-scale purchases of Treasuries in effort to stimulate aggregate demand. While motivated by near-zero overnight interest rates, a side effect of this “quantitative easing” was to monetize government borrowing and irrigate Treasury markets. Second, with bank and dealer balance sheets constrained, new actors further beyond the bank regulatory perimeter, high-frequency traders (HFTs) and hedge funds, stepped in. Some refer to these entities as “shadow dealers,” as they are incentivized to serve the same economic function as dealer firms but are not currently subject to regulation as dealers²⁶ (and are not required or expected to support the market to the same extent as dealers). Shadow

institutions, or GSIBs, also has components that are agnostic to credit risk. See 12 C.F.R. § 217.403.

²⁴ Darrell Duffie, *Still the World's Safe Haven?* (Hutchins Center on Fiscal & Monetary Policy at Brookings, Hutchins Center Working Paper No. 62, 2020), <https://www.brookings.edu/research/still-the-worlds-safe-haven> [<https://perma.cc/C73T-YMGT>].

²⁵ See Tankus, *supra* note 21 (noting that prior to 2008 “both primary dealers and broker-dealers could expand their balance sheets at will”).

²⁶ The Securities and Exchange Commission has proposed broadening the functional definition of government securities dealers in response to the events of 2020. Further Definition of “As a Part of a Regular Business” in the Definition of Dealer and Government Securities Dealer, Exchange Act Release No. 34-94524 (Mar. 28, 2022) (to be codified at 17 C.F.R. pt. 240), <https://www.sec.gov/rules/proposed/2022/34-94524.pdf> [<https://perma.cc/5EV4-PE8R>].

dealers are, in some cases, also shadow banks—they too rely on repo financing. Indeed, their emergence has spurred a rapid expansion in the repo market.²⁷

This ad hoc public finance market structure has proven unstable when subjected to stress. In 2020, the onset of the pandemic revealed that shadow dealers, which were often much more thinly capitalized than commercial banks and lacked explicit or implicit access to central bank backstopping, were extremely vulnerable to run-like dynamics in the face of market volatility. Just when private intermediaries, including hedge funds and high-frequency traders as well as securities dealers, were most needed to warehouse a deluge of sales by end-investors in a largely one-sided market, these firms stepped back in unison. Size constraints may not have been strictly binding on the banking system or individual bank holding companies at the time, but they created a brittle internal arrangement that acted as an amplifier of market volatility. The day was saved only by a dramatic intervention by the Fed, which used its balance sheet to absorb supply and smooth out price fluctuations. It was what Chairman Martin had aimed to avoid: direct central bank intervention undergirding federal finance.

Part V draws on the historical and conceptual framework developed in Parts II through IV to assess various reform proposals. It argues that restoring Treasury market liquidity requires constructing extensible balance sheet capacity in either the public or private sector: marrying monetary expansion and government debt markets together in a stable institutional order. Such a reform could potentially enhance Treasury market liquidity without changing the bank regulatory regime and while also keeping central bank-backed Treasury dealing inside the bank regulatory perimeter.

II. THE ROLE OF MONEY IN THE PRIMARY MARKET

The line between money and the public debt has never been entirely clear or distinct. But it was perhaps sharper in

²⁷ See *infra* Part IV.

the Early Republic, when federal officials constructed a fiscal framework that at least aimed to separate the public purse from the printing press. This changed decisively in the 1860s, when the budgetary demands of the Civil War led Congress to experiment with direct money issue as a means for funding outlays.²⁸ Ultimately, legislators turned to a monetary outsourcing scheme that required federally-incorporated money issuers to buy government debt—the national banking system. In the twentieth century, following the creation of the Federal Reserve and two World Wars, fiscal-monetary entanglement deepened, culminating in a regime of direct debt monetization. Under this regime, the government formally financed its activities through debt markets, but used money printing to reduce the cost of debt finance, and even, in the 1940s, to fix the prices of public debt, converting it into a sort of interest-paying money. This system facilitated a massive expansion in public debt: between 1860 and 1947, the total stock of U.S. government debt grew from \$52 million to more than \$250 billion—an eighty-fold increase relative to activity (1.3% to 105% of GDP) and a more than four-hundred-fold increase in real per capita terms (\$49 to \$21k, in 2020

²⁸ John Steele Gordon, *Paying for the War*, AM. HERITAGE (Mar. 1990), <https://www.americanheritage.com/paying-war> [https://perma.cc/6YG6-LRY6].

dollars).²⁹ (See Table 2 for an overview of the largest increases.)³⁰

Table 2: Net Change in Federal Debt During Several Shocks

Event	Nominal (\$bn)	% of GDP	% of ex-ante GDP	Adj to 2019 GDP	Excl CB purch	Adj to 2019 GDP
Civil War	\$2.60	29%	64%	\$13,692	64%	\$13,692
WWI	\$24.50	31%	53%	\$11,349	53%	\$11,235
WWII	\$208	70%	205%	\$43,887	184%	\$39,279
GFC	\$7,888	39%	54%	\$11,651	43%	\$9,130
Covid	\$5,981	19%	28%	\$5,981	12%	\$2,658

A. Fiscal-Monetary Separation Before the Civil War

Alexander Hamilton, the first Secretary of the Treasury, referred to the public debt as a “blessing” on multiple occasions.³¹ In part, this reflected his belief that the newly-

²⁹ Of that 1947 total, roughly 69% was marketable, most of which was held within the banking system. As of the fourth quarter of 1947, outright holdings by the Federal Reserve totaled \$22.5 billion (13% of the \$175 billion in marketable debt outstanding at the time), while domestic depository institutions owned roughly \$83 billion (47%). Domestic bank balance sheets in particular were roughly two-thirds Treasuries (50%) and cash (12%). Authors’ calculations based on data from *Historical Data on Federal Debt Held by the Public*, CONG. BUDGET OFF. (Aug. 5, 2010), <https://www.cbo.gov/publication/21728> [<https://perma.cc/D2UP-3QCK>]; *Consumer Price Indexes, Series Cc1-65*, HIST. STAT. OF THE U.S. (<https://hsus.cambridge.org/HSUSWeb/toc/showTable.do?id=Cc1-65>) [<https://perma.cc/QG5E-QDJ2>] (last accessed May 19, 2023); *Consumer Price Index, 1913-*, FED. RSRV. BANK OF MINNEAPOLIS, <https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1913-> [<https://perma.cc/6QER-QERP>]; *Area and Population, Series Aa1-109*, HIST. STAT. OF THE U.S., <https://hsus.cambridge.org/HSUSWeb/toc/showTable.do?id=Aa1-109> [<https://perma.cc/9UD5-GE59>] (last accessed May 19, 2023); *Population*, FRED ECON. DATA, <https://fred.stlouisfed.org/series/POPTHM> [<https://perma.cc/K286-M8VK>] (last accessed May 19, 2023).

³⁰ CONG. BUDGET OFF., *supra* note 16; Ctr. For Fin. Stability, *supra* note 16; Bd. of Governors of the Fed. Rsrv. Sys., *supra* note 16.

³¹ Letter from Alexander Hamilton to Robert Morris (April 30, 1781), in 2 THE PAPERS OF ALEXANDER HAMILTON, 1779–1781, 604–35 (Harold C.

constituted federal government needed access to credit to maintain an able and flexible fiscal policy. But Hamilton also offered a further, more novel argument: government debt had a “capacity for prompt convertibility” to currency, potentially rendering transfers “equivalent to a payment in coin.”³² In other words, claims on the sovereign exist in a superposition of states between money³³ and debt. This conveyed a special status on direct obligations of the federal government compared to all other financial assets at a time when money was in short supply.³⁴

Nonetheless, Hamilton rejected direct money issuance as a way for the government to acquire resources. Instead, he helped to establish an outsourcing scheme for money creation that would address the country’s money shortage but insulate monetary policy from fiscal policy. Hamilton thought it essential that legislators be forced to tax or borrow to finance government spending. “The stamping of paper,” he explained, “is an operation so much easier than the laying of taxes, that a government, in the practice of paper emissions, would rarely fail in any such emergency, to indulge itself too far in the employment of that resource, to avoid as much as possible, one less auspicious to present popularity.”³⁵ In Hamilton’s view,

Syrett ed.) (1961) (“A national debt if it is not excessive will be to us a national blessing; it will be powerful [sic] cement of our union.”).

³² 10 THE PAPERS OF ALEXANDER HAMILTON, Dec. 1791–Jan. 1792, 230–340 (1966).

³³ Broad money is typically defined to include the monetary base (currency in circulation and liabilities of the central bank to commercial banks (in the U.S., bank reserves)) as well as various types of bank deposits. Yueh-Yun C. O’Brien, *Measurement of Monetary Aggregates Across Countries*, 3 (Fin. and Econ. Discussion Series, Working Paper No. 2007-02, 2007), <https://www.federalreserve.gov/econres/feds/measurement-of-monetary-aggregates-across-countries.htm> [<https://perma.cc/PF89-K44N>].

³⁴ BRAY HAMMOND, *BANKS AND POLITICS IN AMERICA: FROM THE REVOLUTION TO THE CIVIL WAR* 95–96 (1957); J. LAWRENCE LAUGHLIN, *HISTORY OF BIMETALLISM IN THE UNITED STATES* 52–53 (1891).

³⁵ Alexander Hamilton, *The Report of the Secretary of the Treasury, (Alexander Hamilton), on the Subject of a National Bank*, in 7 CHARLES BROCKDEN BROWN & ROBERT WALSH, *AMERICAN REGISTER, OR GENERAL REPOSITORY OF HISTORY, POLITICS, AND SCIENCE* 225, 238 (Charles Brockden Brown & Robert Walsh eds., 1810).

delegating the power to issue money to private investors would improve the strength of the dollar, as investors would be more likely than government officials to achieve the right rate of monetary expansion.³⁶

Following the Secretary's advice, in 1792, Congress fixed the metal content of dollar coins issued by the U.S. Mint.³⁷ To expand the supply of money beyond the government-issued gold and silver base, Congress chartered the investor-owned Bank of the United States. Although it did not authorize the Bank to create new coins, it did empower the Bank to issue paper notes³⁸ and deposits (which are essentially uncertificated notes).

These notes and deposits, in turn, functioned like additional coins. Here is how Hamilton explained the alchemy:

Every loan, which a Bank makes is, in its first shape, a credit given to the borrower on its books [i.e., a deposit], the amount of which it stands ready to pay, either in its own notes, or in gold or silver, at his option. But, in a great number of cases, no actual payment is made in either. The Borrower frequently, by a check or order, transfers his credit to some other person, to whom he has a payment to make; who, in his turn, is as often content with a similar credit . . . And in this manner the credit keeps circulating, performing in every stage the office of money, till it is extinguished by a discount with some person, who has a payment to make to the Bank, to an equal or greater amount. Thus large sums are lent [by a Bank] and paid, frequently through a variety of hands, without the intervention of a single piece of coin.³⁹

³⁶ *Id.* See also JAMES WILLARD HURST, A LEGAL HISTORY OF MONEY IN THE UNITED STATES 154 (1971) (discussing "Hamilton's emphasis on trusting the creation of currency to private management, because it would be insulated . . . from the pressures that beat upon public officials").

³⁷ The Coinage Act of 1792, ch. 16, §§ 9–20, 1 Stat. 246, 248–51 (1792).

³⁸ The Bank Bill of 1791, 10, §§ 7(XIII), 1 Stat. 191, 195 (1791).

³⁹ 7 THE PAPERS OF ALEXANDER HAMILTON, Sep. 1790–Jan. 1791, 307–08 (1963).

Critically, Congress made the Bank's notes receivable for all payments due to the United States.⁴⁰ That made its notes and deposits as useful as government coins, but much more convenient and practical. Notes could be cheaply and easily transported around the vast American territory. And the Bank's deposits could be transferred by check, without fear of theft or loss.

Consistent with Hamilton's advice, Congress was careful to prevent the Bank from supporting federal finance by printing money. It prohibited the Bank from purchasing "any public debt whatsoever."⁴¹ And it barred loans to the federal government in excess of \$100,000 (as well as loans to state governments in excess of \$50,000).⁴² To enforce these restrictions, Congress authorized a private right of action, with treble damages and a one-fifth reward to any informers.⁴³

It was not long, however, before the Hamiltonian framework for monetary-fiscal separation was tested and entanglement began. During the War of 1812 Congress authorized five Treasury note issues, which were designed to function as money. For example, it denominated the issues as low as \$3 and made them receivable for taxes.⁴⁴ Quickly, the notes came to serve as a circulating medium. They were "used to buy goods and services by individuals, pay custom duties by merchants, and acted as cash reserves for banks."⁴⁵ In 1837, 1842, and 1857, Congress returned to a similar monetary financing strategy.⁴⁶

The antebellum Congress had it relatively easy. The federal government was small compared to the economic output of the country. For more than seventy years after ratification, federal spending rarely exceeded 2% of gross

⁴⁰ The Bank Bill of 1791, ch. 10, § 10.

⁴¹ *Id.* § 7(X).

⁴² *Id.* § 7(XI).

⁴³ *Id.* § 9.

⁴⁴ Donald H. Kagin, *Monetary Aspects of the Treasury Notes of the War of 1812*, 44 J. ECON. HIST. 69, 69 (1984).

⁴⁵ *Id.*

⁴⁶ *Legal Tender Cases*, 79 U.S. 457, 610 (1870).

domestic product (GDP).⁴⁷ By way of comparison, in the United Kingdom, central government spending topped 12% of GDP on average over the same period.⁴⁸ Washington's modest outlays were easily offset by revenue collected, almost all of it from customs.⁴⁹ Combined with economic growth, the net result was a steady decline in the stock of public debt relative to the productive capacity of the U.S., from roughly 15% of GDP at the turn of the nineteenth century to less than 2% in 1860.⁵⁰ Finding buyers for such a modest sum required minimal monetary engineering.

B. Fiscal-Monetary Entanglement: the National Banking System

The outbreak of the Civil War changed everything. Just before hostilities began in 1861, the public held less than \$80 million of federal debt⁵¹; within a year, that amount almost quadrupled to more than \$300 million, before hitting \$1.5 billion in 1863 and reaching \$2.7 billion at war-end (more than 30% of GDP and an increase of thirty-five-fold in just five years).⁵² Placing all this debt proved an extraordinary challenge that strained the country's fragmented financial system. Salmon Chase, Secretary of the Treasury throughout

⁴⁷ U.S. BUREAU OF THE CENSUS, HISTORICAL STATISTICS OF THE UNITED STATES 1789–1945 (1949). There was a brief increase around the War of 1812, but even then only to around 3% of GDP. CONG. BUDGET OFF., HISTORICAL DATA ON FEDERAL DEBT HELD BY PUBLIC (2010), <https://www.cbo.gov/publication/21728> [<https://perma.cc/R89H-2B9H>].

⁴⁸ *A Millennium of Macroeconomic Data*, BANK OF ENGLAND RESEARCH DATASETS, <https://www.bankofengland.co.uk/statistics/research-datasets> [<https://perma.cc/5YY9-66RW>].

⁴⁹ THOMAS L. HUNGERFORD, CONG. RSCH. SERV., RL33665, U.S. FEDERAL GOVERNMENT REVENUES: 1790 TO THE PRESENT 3 (2006); CONG. BUDGET OFF., HISTORICAL DATA ON FEDERAL DEBT HELD BY PUBLIC (2010), <https://www.cbo.gov/publication/21728> [<https://perma.cc/R89H-2B9H>].

⁵⁰ CONG. BUDGET OFF., HISTORICAL DATA ON FEDERAL DEBT HELD BY PUBLIC (2010), *supra* note 49.

⁵¹ Unless otherwise specified, dollar values are in nominal rather than real or otherwise inflation-adjusted terms.

⁵² CONG. BUDGET OFF., HISTORICAL DATA ON FEDERAL DEBT HELD BY PUBLIC (2010), *supra* note 49.

most of the war, tried a variety of schemes to channel the nation's savings toward the war effort.

At first, Chase borrowed from state-chartered banks.⁵³ The Bank of the United States was long gone (it had closed in 1811); and a second incarnation, started in 1816, lost its charter in 1836.⁵⁴ Thereafter, the country depended on a diffuse and uncoordinated mass of much smaller institutions created by the states to augment the limited supply of gold and silver coin issued by the federal government. Although state banks often supported the budgets of their chartering sovereigns, they were under no legal obligation to buy federal debt. The Treasury paid market rates.⁵⁵

In 1861, the government's borrowing needs proved too much for the state banks to handle. Rumors that Britain might enter the War on the side of the South sparked a run on the banks. Having lent most of their gold and silver to the government, the banks (in nearly every state) suspended specie payments to their noteholders and depositors.⁵⁶ Congress responded to the crisis in 1862 by passing the Legal Tender Act, which authorized the Treasury to finance revenue shortfalls by issuing "United States notes" (a new form of paper money).⁵⁷ These notes, colloquially known as "greenbacks" due to their green color, solved the problem of funding the war effort.⁵⁸ But they created a new problem: By expanding the supply of legal reserves, they enabled state banks to issue more paper money of their own. The

⁵³ HAMMOND, *supra* note 34, at 720–21.

⁵⁴ MORGAN RICKS, GANESH SITARAMAN, SHELLEY WELTON & LEV MENAND, NETWORKS, PLATFORMS, AND UTILITIES: LAW AND POLICY 828, 833–35 (2022).

⁵⁵ BRAY HAMMOND, BANKS AND POLITICS IN AMERICA: FROM THE REVOLUTION TO THE CIVIL WAR 723–24 (1957).

⁵⁶ BRAY HAMMOND, SOVEREIGNTY AND AN EMPTY PURSE: BANKS AND POLITICS IN THE CIVIL WAR 150–59 (1970).

⁵⁷ Legal Tender Act, ch. 33, 12 Stat. 345 (1862).

⁵⁸ *Greenback*, MUSEUM OF AM. FIN., https://www.moaf.org/exhibits/checks_balances/abraham-lincoln/greenback [<https://perma.cc/R9SP-KHLA>].

combination generated inflation as well as windfall bank profits.⁵⁹

Policymakers changed course. They decided to phase out direct money printing by creating a new monetary outsourcing scheme. Their goal was to replace the fragmented state-based monetary arrangement with a unified federal system centered around a network of “national banks.”⁶⁰ Policymakers expected that state banks would convert to federal charters—and, when many demurred, Congress imposed a tax on state bank notes so large as to render their note issue uneconomic.⁶¹ In place of thousands of different state bank notes of varying value, the “national banking system” would offer a uniform currency of “national bank notes,” which would be receivable in payment of taxes and other federal obligations,⁶² just like the notes of the Bank of the United States. But unlike that earlier federal instrumentality, national banks would not be prohibited from buying public debt. To the contrary, national banks would be required to support federal finance: all “national bank notes” would be backed by Treasury securities.⁶³

Formally, under the national banking system the federal government was not money-financed. It sold securities to cover its deficits. But functionally, it created a network of investor-owned instrumentalities to augment the money supply which it used to support its fiscal policy: its money-issuing instrumentalities were chartered on the condition that they monetize the federal debt. By the first decade of the twentieth century, there was about \$1 billion of interest-

⁵⁹ Lev Menand & Morgan Ricks, *Federal Corporate Law and the Business of Banking*, 88 U. CHI. L. REV. 1361, 1385 (2021).

⁶⁰ ROGER LOWENSTEIN, *WAYS AND MEANS: LINCOLN AND HIS CABINET AND THE FINANCING OF THE CIVIL WAR* 166–69 (2022).

⁶¹ Act of 1865, § 6, 13 Stat. 469, 484 (1865) (to provide internal revenue to support the government). *See also* *Veazie Bank v. Fenno*, 75 U.S. 533, 549 (1869).

⁶² National Bank Act, ch. 106, § 32, 13 Stat. 99, 109 (1864).

⁶³ *Id.* § 21.

bearing Treasury debt outstanding, and fully 80% of it was owned by national banks.⁶⁴

C. Fiscal-Monetary Entanglement: the Federal Reserve System

In 1913, Congress modified the basic legal framework for banking by passing the Federal Reserve Act.⁶⁵ By this point, hopes of a single federal system had been dashed. The bank note tax was a pyrrhic victory. State bank notes vanished and with them, at first, most state banks.⁶⁶ But bankers discovered that checks on deposit accounts, when supplemented with clearinghouses for facilitating interbank payments, offered a superior monetary instrument to notes for many purposes.⁶⁷ In the 1880s and '90s, the states chartered thousands of new banks,⁶⁸ and the dominant form of money shifted from notes (over which Congress had given national banks an effective monopoly) to deposit account balances transferrable by check (which federal law did nothing to prevent state banks from issuing).⁶⁹

Legislators designed the Fed to stabilize this deposit currency, issued by both national and state banks, and to manage its expansion and circulation. The initial Federal Reserve Act gave rise to twelve corporations known as Federal Reserve Banks (FRBs) and an independent “board of control,”⁷⁰ the Federal Reserve Board (renamed the Board of Governors of the Federal Reserve System in 1935).⁷¹ Congress

⁶⁴ KENNETH GARBADE, *THE BIRTH OF A MARKET: THE U.S. TREASURY SECURITIES MARKET FROM THE GREAT WAR TO THE GREAT DEPRESSION* 1 (2012).

⁶⁵ Federal Reserve Act, Pub. L. No. 63–43, 38 Stat. 251 (1913) (codified as amended at 12 U.S.C. §§ 221–226 (2022)).

⁶⁶ RICKS, SITARAMAN, WELTON & MENAND, *supra* note 53, at 839.

⁶⁷ For example, checks could be written in any denomination.

⁶⁸ Matthew Jaremski & Peter L. Rousseau, *The Dawn of ‘An Age of Deposits’ in the United States*, 87 J. BANKING & FIN. 264, 266, Fig. 1 (2018).

⁶⁹ *Id.* at 265.

⁷⁰ CARTER GLASS, *ADVENTURES IN CONSTRUCTURE FINANCE* 116 (1927).

⁷¹ *Fed Facts: Meet the Board of Governors*, FRBSERVICES.ORG (JUNE 15, 2020), <https://www.frbservices.org/news/fed360/issues/061520/fed-facts->

authorized the FRBs to issue a new currency called Federal Reserve Notes and to lend these notes to investor-owned banks to support their balance sheets.⁷² But this lending was strictly limited: borrowing banks would have to use commercial loans as collateral. Treasuries were not eligible. Congress also authorized the FRBs to purchase assets on the “open market,” including Treasuries, but legislators did not, at least initially, expect that the FRBs would use this authority to buy large quantities for their own account.⁷³ They did, however, expect the steady retirement of national bank notes, and authorized the Fed to absorb the Treasuries sold off by the national banking system.⁷⁴

The First World War

Months later, war struck again. The new conflict required a commitment of resources by American society not attempted since the Civil War. Woodrow Wilson’s Secretary of the Treasury, W. G. McAdoo, fancied himself a scholar of that period.⁷⁵ But he saw little to emulate in tackling the “prodigious problem”⁷⁶ of financing what came to be known as World War I. “I did not get much in the way of inspiration or suggestion from a study of the Civil War,” he later recalled, “except a pretty good idea of what not to do.”⁷⁷ In McAdoo’s estimation, his predecessor, Salmon Chase, had made a

board#:~:text=The%20Banking%20Act%20of%201935,the%20president%20to%20seven%20and [https://perma.cc/82K6-PTV2].

⁷² These notes were not initially legal tender, but they were receivable in payment of taxes, customs, and other public dues. They were also payable in gold at the Treasury in Washington. Federal Reserve Act, Pub. L. No. 63–43, § 16, 38 Stat. 251, 269 (1913) (codified as amended at 12 U.S.C. §§ 221–226 (2022)).

⁷³ The idea was to provide a way for the FRBs to generate a steady stream of interest income to cover their expenses. *Id.* § 14.

⁷⁴ GARBADE, *supra* note 64, at 28.

⁷⁵ WILLIAM G. MCADOO, CROWDED YEARS: THE REMINISCENCES OF WILLIAM G. MCADOO 372–73 (1931).

⁷⁶ *Id.* at 372.

⁷⁷ *Id.* at 373.

“fundamental error”⁷⁸ by not tapping into popular passions to funnel the nation’s savings into the war effort. “Any great war must necessarily be a popular movement,” he wrote, “it is a kind of crusade; and like all crusades it sweeps along on a powerful stream of romanticism.”⁷⁹ Whether out of fear or lack of imagination,⁸⁰ McAdoo believed that Chase’s reluctance to summon the masses pushed him to rely on “extraordinary expedients,”⁸¹ including money printing. The result was excessive inflation.⁸²

McAdoo’s solution was a series of nation-wide war bond sales drives: the Liberty Loans. These massive campaigns⁸³ were aimed at individual investors, seeking to tap the collective savings of the American people. The government launched an aggressive marketing effort involving millions of volunteers across the country as well as free advice from large advertising agencies, space in newspapers and periodicals, free money order services for subscribers, and installment plans to buy bonds at department stores, and many more contributions large and small.⁸⁴ As of 1916, the Treasury counted roughly 350,000 holders of its debt;⁸⁵ by the end of the

⁷⁸ *Id.* at 374.

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ *Id.*

⁸² Hugh Rockoff, *War and Inflation in the United States from the Revolution to the First Iraq War* 23–29 (Nat’l Bureau of Econ. Rsch., Working Paper No. 21221, 2015).

⁸³ For contemporaneous accounts that both describe the various means by which Liberty Bonds were marketed and the often flowery language used to do so, see, for example, EDWARD CLIFFORD, FED. RRSV. BANK OF CHI., *SELLING THE FIRST INSTALLMENT OF THE LIBERTY LOAN: IN THE SEVENTH FEDERAL RESERVE DISTRICT MAY 4TH TO JUNE 15TH 1917* (1917); LABERT ST. CLAIRE, *THE STORY OF THE LIBERTY LOANS: BEING A RECORD OF THE VOLUNTEER LIBERTY LOAN ARMY, ITS PERSONNEL, MOBILIZATION AND METHODS. HOW AMERICA AT HOME BACKED HER ARMIES AND ALLIES IN THE WORLD WAR* (1919).

⁸⁴ *Plans Wide Appeal to Sell New Bonds*, N. Y. TIMES, Apr. 23, 1917, at 4.

⁸⁵ In his 1917 Annual Report, McAdoo noted that, prior to the start of the First Liberty Loan drive, “it was estimated by bankers that there were only about 350,000 bond investors in the United States; the people generally

war, tens of millions had participated in at least one of four Liberty Loan and two Victory Loan drives⁸⁶—often purchasing bonds in relatively small denominations.⁸⁷ In all, the federal government raised \$18.5 billion, or nearly fifteen times the total pre-war debt stock. Perhaps even more impressively, all six campaigns were heavily oversubscribed, with total orders for 30% more than was offered.⁸⁸

Although McAdoo sought to rely on patriotic individuals to fund the war effort, for all their success, the Liberty Loans were not, on their own, enough to meet the moment.⁸⁹ Ultimately, he decided to conscript the banking system to keep the financial war machine running. The new Federal Reserve, by extending its balance sheet and exerting influence over bank activities, was at the center of that effort. As the *New York Times* declared, on the eve of the Armistice, the Fed “ranks with our man power and our industries among the

were, therefore, unacquainted with Government bonds.” OFF. OF THE SEC’Y, TREASURY DEP’T, ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30 1917, at 6 (1918).

⁸⁶ Hugh Rockoff, *Until It’s Over, Over There: The U.S. Economy in World War I*, at 34 tbl.6 (Nat’l Bureau of Econ. Rsch., Working Paper No. 10580, 2004).

⁸⁷ OFF. OF THE SEC’Y, TREASURY DEP’T, ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30 1917, at 7–8, 11 (1918); OFF. OF THE SEC’Y, TREASURY DEP’T, ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30 1918, at 9–12 (1919); OFF. OF THE SEC’Y, TREASURY DEP’T., ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30 1919, at 75–76 (1920).

⁸⁸ Hugh Rockoff, *Until It’s Over, Over There: The U.S. Economy in World War I* 34 tbl.6 (Nat’l Bureau of Econ. Rsch., Working Paper No. 10580, 2004).

⁸⁹ This was recognized early on by academics. For example, as O. M. W. Sprague of Harvard, writing in March 1917, observed: “Many subscribers borrow from banks the funds required to meet their commitments, pledging other property and even the war loan itself. The banks adopt a liberal patriotic loan policy and also subscribe largely on their own account.” O. M. W. Sprague, *Loans and Taxes in War Finance*, 7 AM. ECON. REV. 199, 200 (1917).

forces that enabled us to bear our part in the war.”⁹⁰ This “tower of strength”⁹¹ was deployed in several distinct but related ways.

First, individual investors were encouraged to purchase Liberty Bonds on credit—essentially leveraging their personal equity to supplement demand. “[E]very man of means can and must constitute himself a banker to the Government,” one commenter later argued. “He should, from a proper sense of duty ... He must, to protect his equity in and holding of material possessions.”⁹² Or, perhaps more evocatively, the charge was issued: “[b]orrow and buy until it hurts.”⁹³ The Fed facilitated this masochism by offering lower rates for loans to the banks themselves secured by government securities.⁹⁴ Thus, rather than competing with each other in the private market, banks looking to facilitate “borrow and buy” loans could obtain cheap funding from the Fed.

Second, as the war dragged on, banks provided essential bridge financing between Liberty Loan campaigns. This was done principally through short-term certificates of indebtedness, which were issued in anticipation of major loan drives and tax collections.⁹⁵ Banks were not obligated to participate, but McAdoo leaned heavily on the bully pulpit. “I must have the whole-hearted cooperation of the bankers of the

⁹⁰ *Mr. McAdoo Resigns*, N. Y. TIMES, Nov. 23, 1918, at 10.

⁹¹ *Id.*

⁹² Theodore Prince, *Borrow to Buy Bonds*, N. Y. TIMES, Oct. 17, 1918, at 14.

⁹³ “*Liberties*” *As Collateral*, N. Y. TIMES, June 3, 1921, at 11. As another example, an advertisement placed in the *Wall Street Journal* by a number of large New York City banks declared “Let us mobilize the magnificent machinery of the bank of America into the war-service of our Government in the most tremendous crisis in its history. Every man in the United States with a bank account must go to his bank, borrow **all he can**, and buy Government Bonds.” *Borrow and Buy*, WALL ST. J., Oct. 23, 1917, at 7 (emphasis in original).

⁹⁴ GARBADE, *supra* note 64, at 132–42; FEDERAL RES. BANK N.Y., CIRCULAR NO. 64 (May 22, 1917); FED. RES. BANK N.Y., CIRCULAR NO. 72 (June 13, 1917).

⁹⁵ For a detailed description of the use of certificates of indebtedness during the First World War, see GARBADE, *supra* note 64, at 110–21.

United States,” he wrote in a telegram delivered to every bank and trust in the country, “and to that end I request the board of directors or trustees of each bank and trust company to reserve each week . . . 1 per cent of gross resources . . . not to exceed in the aggregate 10 per cent and to invest that amount in Treasury certificates of indebtedness.”⁹⁶ According to the Wall Street Journal, McAdoo’s telegram appeared to be “coercion to float Government loans.”⁹⁷ Coercion or not, McAdoo would repeat these strongly worded “requests” several times before the war was finished.⁹⁸

Third, the Fed and Treasury redirected the money supply towards war finance using voluntary credit controls. Bankers were concerned that meeting McAdoo’s expectations would harm their “usual business” of making loans to, and taking deposits from, customers.⁹⁹ Meeting the demands of those customers as well as the expectations of the Treasury risked an inflationary overexpansion of the money supply. “It is clear,” the Board wrote in a public statement, “that if the war

⁹⁶ OFF. OF THE SEC’Y, TREASURY DEP’T, ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30 1918, at 20 (1919).

⁹⁷ *Certificates Pave Way for Government Loan*, WALL ST. J., Feb. 8, 1918, at 10.

⁹⁸ When the results of the first public pressure campaign turned out somewhat lackluster, McAdoo was public with his “distinct” disappointment, adding, almost threateningly, “no doubt this error will not be repeated.” *Announcement by William G. McAdoo (Feb. 21, 1918)*, in 4 FED. RSRV. BULL. 153, 162 (March 1918). McAdoo made further appeals the banking system in the lead-up to subsequent Liberty Loan campaigns. Letter from Secretary McAdoo to Banks (June 12, 1918), in OFF. OF THE SEC’Y, TREASURY DEP’T, ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30 1918, at 22 (1919); Letter from Secretary McAdoo to Banks (Nov. 17, 1918), in OFF. OF THE SEC’Y, TREASURY DEP’T, ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30 1919, at 56–67 (1920). His successor, Carter Glass, did the same. Letter from Carter Glass to Hon. Claude Kitchin (Jan. 15, 1919), in OFF. OF THE SEC’Y, TREASURY DEP’T, ANNUAL REPORT OF THE SECRETARY OF THE TREASURY ON THE STATE OF THE FINANCES FOR THE FISCAL YEAR ENDED JUNE 30 1919, at 41 (1920).

⁹⁹ *Review of the Month*, 4 FED. RSRV. BULL. 247, 260 (April 1918).

requirements of the Government are to be financed without undue expansion of banking credits, not only must there be some reduction of existing credits, but there will have to be a rigid check upon the further expansion of credit in directions not clearly essential for the prosecution of the war.”¹⁰⁰ The solution, they decided, was to “convert less essential into more essential credit” (their emphasis) to “conserve the credit of [banks] for the use of the Government as far as may be practicable.”¹⁰¹

The Second World War

Although United States did not join the Allies until December 1941, its financial involvement in the Second World War began nearly a year earlier. Significant commitments, not least among them the Lend-Lease Program authorized by Congress in March 1940, helped expand federal spending by more than 44%.¹⁰² To fund the widening deficit, the Treasury had to find new buyers for commensurately large increases in debt held by the public.¹⁰³ As early as March 1941, senior officials at the Federal Reserve contemplated “assisting the Treasury in regard to the financing operations of the government,”¹⁰⁴ and at its June meeting, considered a more explicit program of support including potentially establishing

¹⁰⁰ *Id.*

¹⁰¹ *Id.* at 260–63.

¹⁰² To more than \$13.6bn (11.7% of gross domestic product (GDP)) from \$9.5bn (9.6% GDP) the prior year. Off. of Mgmt. & Budget, Exec. Off. of the President, *Historical Tables: Table 3.1—Outlays by Superfunction and Function: 1940–2027*, WHITE HOUSE (2022), <https://www.whitehouse.gov/omb/budget/historical-tables/> [https://perma.cc/3PKR-G55M].

¹⁰³ Gross federal debt held by the public increase by roughly \$5.4bn from year-end 1941 to 1942. Off. of Mgmt. and Budget, *Historical Tables: Table 7.1 – Federal Debt at the End of the Year: 1940–2-027*, WHITE HOUSE (2022), <https://www.whitehouse.gov/omb/budget/historical-tables/> [https://perma.cc/HLT4-GYAC].

¹⁰⁴ Fed. Open Mkt. Comm. Meeting Minutes 11 (March 17, 1941), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19410317.pdf> [https://perma.cc/4ECK-G7UE].

a “definite rate . . . for long-term Treasury offerings”¹⁰⁵ and “regular conferences” to coordinate “the entire field of fiscal and monetary policy.”¹⁰⁶

After quite a bit of further consideration and inter-agency back-and-forth,¹⁰⁷ a tentative agreement was reached in late March 1942 and announced publicly the following month. The Federal Open Market Committee (FOMC), which sets monetary policy for the United States, committed to use open market operations to peg the level of interest rates on government debt. The result was a 0.375% interest rate ceiling on bills and a 2.5% cap on longer maturity issues.¹⁰⁸ Bills remained at or below the peg until mid-1947,¹⁰⁹ when the FOMC gradually released its grip on shorter maturities,¹¹⁰ but it would prove harder to exit the market for longer-dated bonds.¹¹¹

¹⁰⁵ Fed. Open Mkt. Comm. Meeting Minutes 8 (June 10, 1941), <https://www.federalreserve.gov/monetarypolicy/files/FOMChminec119410610.pdf> [<https://perma.cc/Y6MH-8846>].

¹⁰⁶ *Id.* at 10.

¹⁰⁷ For a narrative account, see Elmus R. Wicker, *The World War II Policy of Fixing a Pattern of Interest Rates*, 24 J. FIN. 447 (1969).

¹⁰⁸ For a more detailed discussion, see KENNETH GARBADE, FED. RSRV. BANK OF N.Y., STAFF REPORTS NO. 913, MANAGING THE TREASURY YIELD CURVE IN THE 1940S, at 9–12 (2020); Memorandum from Radha Chaurushiya & Ken Kuttner to Mr. Kos & Mr. Reinhart, Targeting the Yield Curve: The Experience of the Federal Reserve, 1942–51 (Jun. 18, 2003), <https://www.federalreserve.gov/monetarypolicy/files/FOMC20030618memo01.pdf> [<https://perma.cc/U8SN-826J>].

¹⁰⁹ Nat'l Bureau of Econ. Rsch., *Yields on Short-Term United States Securities, Three-Six Month Treasury Notes and Certificates, Three Month Treasury Bills for United States*, FED. RSRV. BANK OF ST. LOUIS (Aug. 17, 2022), <https://fred.stlouisfed.org/series/M1329BUSM193NNBR> [<https://perma.cc/U4MY-YG7D>].

¹¹⁰ Fed. Open Mkt. Comm. Minutes 7 (June 30, 1947), <https://perma.cc/U4MY-YG7D> [<https://perma.cc/ETS5-7YL2>]; FED. RSRV. BANK OF N.Y., CIRCULAR NO. 3230 (July 3, 1947).

¹¹¹ Nat'l Bureau of Econ. Rsch., *Yields on Short-Term United States Securities, Three-Six Month Treasury Notes and Certificates, Three Month Treasury Bills for United States*, FED. RSRV. BANK OF ST. LOUIS (Aug. 17, 2022), <https://fred.stlouisfed.org/series/M1329BUSM193NNBR> [<https://perma.cc/9KXT-VWU2>].

A direct consequence of this commitment was that most wartime deficit spending was financed by increasing the money supply. This occurred via two channels.

First, the Fed itself was a major direct purchaser of Treasuries. Between 1941 and 1945, the System acquired roughly \$22 billion (15% of net marketable debt supply and 9% of the total net increase in interest-bearing debt). Most of this was funded by new currency in circulation, which increased by more than \$16 billion between 1941 and 1945;¹¹² balances due to member banks (i.e., bank reserves) only increased by roughly \$3 billion over the same period.¹¹³ Though initially spread across the full range of maturities, the Fed's holdings quickly became highly concentrated at the front end of the curve—in fact, the System was a net seller of one-year and longer maturities from 1943 onwards.¹¹⁴ This reflected maturity extension among private investors seeking to pick up yield with short-term instruments pegged near zero, but notes and bonds allowed to trade at much more attractive rates.¹¹⁵

Second, commercial banks had an even larger footprint in the market as government spending on defense crowded out private activity and credit. Between 1941 and 1945, they bought more than \$73 billion (51% of marketable and 32% of total interest-bearing debt supply).¹¹⁶ They were active at the

¹¹² FED. RSVR BANK OF ST. LOUIS, *Federal Reserve Notes in Actual Circulation*, FED. RSRV. ECON. DATA (Feb. 10, 2021), <https://fred.stlouisfed.org/series/LNCFRNC> [<https://perma.cc/ZB3B-KLVW>]. For a more detailed discussion of demand for currency during the war years, see G. L. BACH, *Currency in Circulation*, 30 FED. RSRV. BULL. 305, 318–28 (1944).

¹¹³ FED. RSRV. BANK OF ST. LOUIS, *supra* note 112; FED. RSRV. BANK OF ST. LOUIS, *Other Deposits Held by Depository Institutions*, FED. RSRV. ECON. DATA (Feb. 10, 2021), <https://fred.stlouisfed.org/series/LDODHDI> [<https://perma.cc/STH3-CN4D>].

¹¹⁴ GARBADE, *supra* note 108.

¹¹⁵ *Id.* at 9–12.

¹¹⁶ U.S. DEP'T OF THE TREASURY, *Holdings of Direct and Guaranteed Interest-Bearing Obligations of the United States Government*, in BULLETIN OF THE TREASURY DEPARTMENT JANUARY 1940, at 20; U.S. DEP'T OF THE TREASURY, *Public Marketable Public Debt Securities, Part A: Analysis of*

front end, but also greatly increased their holdings of longer maturities—more than half of net commercial bank purchases had a maturity of greater than one year, and 29% had a maturity of greater than five years as of 1945.¹¹⁷ The growth of bank securities portfolios was financed almost entirely by expanding the broad money supply by issuing new deposits, which increased by roughly \$78 billion between 1941 and 1945; loan balances were largely unchanged over the same period.¹¹⁸ The result was a significant increase in system-wide bank leverage, with size-based capital ratios declining from 9.4% to 5.5% over just five years.

Ultimately, these methods enabled the massive expansion in federal spending and public debt needed to prosecute the war. In total, the stock of these direct obligations of the government more than doubled relative to economic activity—from 43% of GDP in 1939 to more than 110% in 1945.¹¹⁹ To put this in a more recognizable, modern context, if we size a similar program to 2019 GDP it was as if the Treasury was able to issue more \$40 trillion of new Treasuries over just a few years.¹²⁰

Ownership by Type of Security, by Call Classes, and by Tax Status, TREASURY BULLETIN JANUARY 1946, at 49.

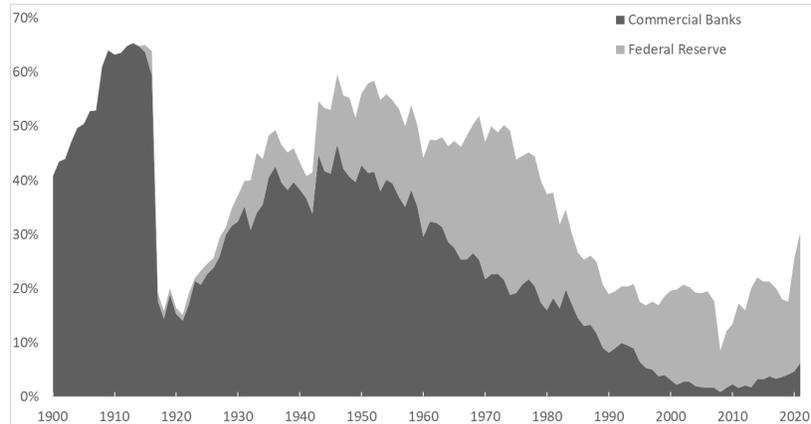
¹¹⁷ U.S. DEP'T OF THE TREASURY, *Maturity Schedule of Interest-Bearing Marketable Securities*, in BULLETIN OF THE TREASURY DEPARTMENT DECEMBER 1945, at 29-31.

¹¹⁸ Fed. Rsvr. Bank of St. Louis, *Banking and Monetary Statistics 1941–1970*, FRASER (Sep. 1976), <https://fraser.stlouisfed.org/title/banking-monetary-statistics-1941-1970-41> [<https://perma.cc/K5DB-2TAE>].

¹¹⁹ CONG. BUDGET OFF., *supra* note 16.

¹²⁰ We compare the total increase in debt held by the public inferred from CONG. BUDGET OFF., *supra* note 16, as a fraction of 1939 GDP and scale it to the growth of the U.S. economy through 2019. Fed. Rsvr Bank of St. Louis, *Gross Domestic Product*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/GDP> [<https://perma.cc/WNG2-LBSS>] (last visited May 20, 2023).

Table 3: Percentage of Public Debt Owned by Banks and the Fed¹²¹



III. THE TURN TO SECONDARY MARKETS: THE RISE OF THE PRIMARY DEALER SYSTEM

Despite the success of the government's fiscal-monetary regime at financing the government during World War II, officials at the Fed were eager to adjust their role in the process. This Part recovers the origins of modern Treasury market structure and offers a detailed account of the pivotal years in the early 1950s. It explains, first, the deal Fed officials struck to escape monetizing Treasuries directly: the central bank would ensure orderly markets instead. Next, it shows how that deal was put to the test in 1953, prompting the Fed to commit its own balance sheet for the purposes of government finance once again. Third, it argues that the return of disorderly conditions in the absence of central bank

¹²¹ Fed. Rsrv. Bank of St. Louis, *Market Value of Marketable Treasury Debt*, FED. RESERVE ECON. DATA, <https://fred.stlouisfed.org/series/MVMTD027MNFBRBDAL> [<https://perma.cc/MT9B-KJVG>]; Fed. Rsrv. Bank of St. Louis, *Ressources and Assets: U.S. Government Securities: Bought or Held Outright: Total Bought Outright*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/RAGSOTBO> [<https://perma.cc/Y5HJ-WSUG>].

purchases led the Fed to construct a new market structure centered on a new monetary instrument: the repurchase agreement or repo. The Fed used repos to support a group of nonbank dealers, the “primary dealers,” and to facilitate their ability to money-finance their inventories on an ongoing basis by entering into similar repurchase agreements with private sector firms. Fourth, it explains how policy makers strengthened the new dealer funding mechanism by legislating explicit bankruptcy remoteness for repurchase agreements in law (thereby further enhancing their money-ness). Finally, it traces the resulting growth in repo funding, secondary market liquidity for Treasuries, and what became known as shadow banking.

A. The Fed-Treasury Accord of 1951

In the early 1950s, the Fed began to seek alternative frameworks for public finance. One animating concern was the existing heavy use of bank balance sheets. After the war, the U.S. had a much larger central government—ten years after V-J Day, federal spending was not much below its wartime peak (roughly \$68 billion versus \$98 billion in 1945 and \$9 billion in 1940) and the stock of debt held by the public stood at \$226 billion (versus \$242 billion in 1942 and \$43 billion in 1940).¹²² Relying on bank money creation to service this debt risked crowding out private bank lending. By 1950, for example, commercial bank balance sheets were dominated by Treasury securities (56%) and cash (18%), with loans accounting for only 36% of consolidated assets.¹²³

¹²² Friedman & Schwartz, *Table Cj 42-48 – Stock of money and its components: 1867-1947*, HSUS.CAMBRIDGE, <https://hsus.cambridge.org/HSUSWeb/toc/tableToc.do?id=Cj42-48> [https://perma.cc/MLJ5-FAV4] (last accessed May 20, 2023); Rasche, *Table Cj48 -53 – Stock of money and its components: 1947 – 1958*, HSUS.CAMBRIDGE, <https://hsus.cambridge.org/HSUSWeb/toc/tableToc.do?id=Cj49-53> [https://perma.cc/6R6K-AXGF] (last accessed May 20, 2023).

¹²³ BD. OF GOVERNORS OF THE FED. RSRV. SYS., H.4.2 WEEKLY CONSOLIDATED CONDITION REPORT OF LARGE COMMERCIAL BANKS IN THE UNITED STATES: JANUARY 4, 1950 (1950),

Another motive was freeing the central bank's own balance sheet. Monetizing the debt had contributed to a dramatic increase in the money supply: between 1940 and 1952, M2 (broad money including deposits)¹²⁴ grew at an annualized pace of 12.5%,¹²⁵ significantly outpacing the 9% annualized growth in nominal economic activity (4% in real terms) over the same period.¹²⁶ The transition from butter to guns and back again resulted in now-familiar supply chain issues, exacerbating these imbalances. Wartime price controls, enacted in 1942 and administered by Office of Price Administration (OPA), were largely effective, but ended abruptly in June 1946, when a presidential veto allowed the OPA's authorizing legislation to expire without replacement. Prices jumped rapidly¹²⁷—by roughly 8% and 14% in 1946 and 1947, respectively, across all categories of consumer spending (6% and 12% excluding food).¹²⁸ After some relief in 1948–'49,

https://fraser.stlouisfed.org/files/docs/releases/h42/h42_19500104.pdf?utm_source=direct_download [<https://perma.cc/5Y9D-5MDE>].

¹²⁴ For an overview of monetary aggregates as defined by the Federal Reserve, see John R. Walter, *Monetary Aggregates: A User's Guide*, FED. RSRV. BANK OF RICHMOND ECON. REV. 20 (Jan.–Feb. 1989).

¹²⁵ FRIEDMAN & SCHWARTZ, *Table Cj 42-48 – Stock of money and its components: 1867-1947*, HSUS.CAMBRIDGE, <https://hsus.cambridge.org/HSUSWeb/toc/tableToc.do?id=Cj42-48> [<https://perma.cc/MLJ5-FAV4>]; Rasche, *Table Cj48 -53 – Stock of money and its components: 1947 – 1958*, HSUS.CAMBRIDGE) <https://hsus.cambridge.org/HSUSWeb/toc/tableToc.do?id=Cj49-53> [<https://perma.cc/6R6K-AXGF>].

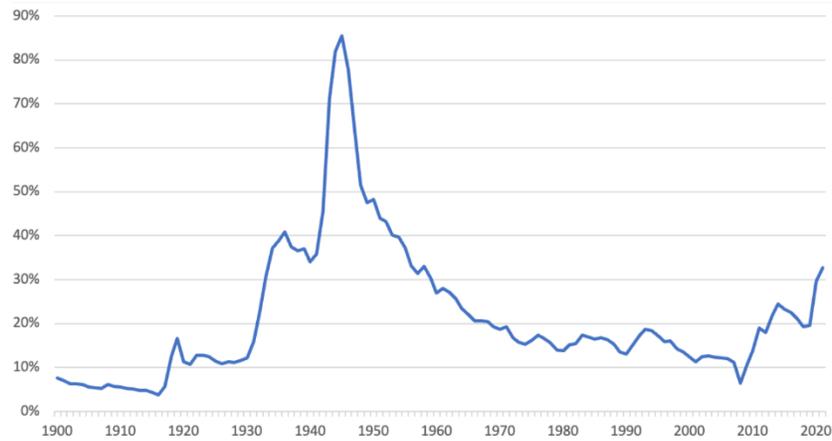
¹²⁶ CONG. BUDGET OFF., FEDERAL DEBT HELD BY THE PUBLIC, 1790 TO 2000 (2010), <https://www.cbo.gov/publication/21728> [<https://perma.cc/R8S3-AVYK>].

¹²⁷ LINDERT & SUTCH, *Table Cc1-2 – Consumer price indexes, for all items: 1774-2003*, HSUS.CAMBRIDGE, <https://hsus.cambridge.org/HSUSWeb/toc/tableToc.do?id=Cc1-2>, [<https://perma.cc/XB3E-AHGC>]. For a more detailed history of price controls in the U.S. during World War II, see ISABELLA M. WEBER, *HOW CHINA ESCAPED SHOCK THERAPY: THE MARKET REFORM DEBATE* 42–69 (2021).

¹²⁸ Monetary policy tends to be set on the basis of so-called core inflation measures, which exclude volatile components like food and energy. We approximate this adjustment for the 1940s using the Survey of Expenditures conducted by the Bureau of Labor Statistics at the time. *Consumer Spending in World War II: The Forgotten Consumer Expenditure*

the outbreak of fighting in Korea reignited the problem, with consumer prices increasing at a double-digit pace once again during the second half of 1950 into early 1951.¹²⁹

Table 4: Bank Treasury Holdings as a Percentage of M2¹³⁰



At its June 1950 meeting, the FOMC was increasingly focused on the “rises in price of an unexpected and most alarming character.”¹³¹ Concerns over the Fed’s limited ability to simultaneously tighten monetary policy and maintain stability in long-term interest rates kicked off a

Surveys, U.S. BUREAU OF LAB. STAT. (Aug. 2015), <https://www.bls.gov/opub/mlr/2015/article/consumer-spending-in-world-war-ii-the-forgotten-consumer-expenditure-surveys.htm> [<https://perma.cc/PL8N-F2FB>].

¹²⁹ A six-month rolling annualized rate for consumer prices across all covered categories based on data collected by the Bureau of Labor Statistics peaks at 12% for September 1950 to February 1951. U.S. Bureau of Lab. Stat., *Consumer Price Index for All Urban Consumers: All Items in U.S. City Average*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/CPIAUCSL> [<https://perma.cc/VX4V-28BG>].

¹³⁰ CONG. BUDGET OFF., *supra* note 14; HISTORICAL DATA ON FEDERAL DEBT HELD BY THE PUBLIC (2010); Ctr. For Fin. Stability, *supra* note 14; Bd. of Governors of the Fed. Rsrv. Sys., *supra* note 14.

¹³¹ Fed. Open Mkt. Comm. Meeting Minutes 5 (June 13, 1950), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19530305.pdf> [<https://perma.cc/C4NV-59AF>].

frenetic back and forth with the Treasury, culminating in a March 1951 decision to finally release control of bond yields.¹³² The announcement itself was cryptic, referring only to a “full accord with respect to debt-management and monetary policies” and acknowledging the “common purpose [of both agencies] to assure the successful financing of the Government’s requirements” while “minimize[ing] monetization of the public debt.”¹³³ But behind this short statement, known today as the Treasury-Fed Accord (hereafter simply “the Accord”), was a careful balancing of interests. Fed officials sought to address high post-War inflation by slowing the growth in the money supply and limiting its Treasury purchases; the Treasury sought to finance government deficits smoothly and in a way that did not unduly burden taxpayers.¹³⁴

Fed officials also hoped that lifting pegs on Treasury rates, what they called a “transition to free markets,” would improve monetary policy implementation.¹³⁵ Specifically, they sought to control monetary expansion through open market operations rather than through adjusting reserve

¹³² Memorandum from Radha Chaurushiya & Ken Kuttner to Mr. Kos & Mr. Reinhart, Targeting the Yield Curve: The Experience of the Federal Reserve, 1942–51 (June 18, 2003), <https://www.federalreserve.gov/monetarypolicy/files/FOMC20030618memo01.pdf> [<https://perma.cc/U7UV-UKPR>]; Robert L. Hetzel and Ralph F. Leach, *The Treasury-Fed Accord: A New Narrative Account*, 87 FED. RSRV. BANK OF RICHMOND ECON. Q. 33, 50–51 (2001), https://www.richmondfed.org/-/media/RichmondFedOrg/publications/research/economic_quarterly/2001/winter/pdf/hetzel.pdf [<https://perma.cc/V2KV-GDX3>].

¹³³ FED. RSRV. BANK OF N.Y., JOINT ANNOUNCEMENT BY THE SECRETARY OF THE TREASURY AND THE CHAIRMAN OF THE BOARD OF GOVERNORS, AND THE FEDERAL OPEN MARKET COMMITTEE, OF THE FEDERAL SYSTEM (Mar. 5, 1951), <https://fraser.stlouisfed.org/title/federal-reserve-bank-new-york-circulars-466/3665-joint-announcement-secretary-treasury-chairman-board-governors-federal-open-market-committee-federal-reserve-system-11144> [<https://perma.cc/5KJQ-Q2NG>].

¹³⁴ Hetzel & Leach, *supra* note 134, at 33–34.

¹³⁵ William M. Martin, Chairman, Bd. of Governors of the Fed. Rsrv., *The Transition to Free Markets*, Remarks delivered at the Economic Club of Detroit (Apr. 13, 1953).

requirements or discount window lending to banks.¹³⁶ Doing this—targeting overnight interest rates through purchases and sales—required that the FOMC be able to easily transact in Treasuries to fine-tune the supply of reserves to banks. Writing in 1952, the authors of the *Ad Hoc Subcommittee Report on the Government Securities Market* (“the Ad Hoc Report”),¹³⁷ commissioned by the FOMC to study the implementation of monetary policy under the Accord, observed that “a securities market, in which the forces of supply and demand . . . were permitted to express themselves in market prices and market yields, was indispensable to the effective executive of monetary policies directed towards financial equilibrium and economic stability . . . without detriment to the long-run purchasing power of the dollar.”¹³⁸

B. The (Forgotten) Treasury Market Breakdown of 1953

But constructing deep and liquid secondary markets in government securities markets was easier said than done. Lifting the caps on long-term yields was not enough. Facilitating efficient price discovery required institutions that could manage dynamic and volatile inventories of securities. After roughly a decade of heavily managed markets and strict yield curve control, government securities dealers lacked the leverage or funding to perform such a role.

Matters came to a head in 1953.¹³⁹ In March, the FOMC formalized what became known as the “bills only doctrine.”¹⁴⁰ The Fed would not only remove its pegs, but it would confine

¹³⁶ *Federal Reserve System after Fifty Years, Hearings before the House Subcomm. on Domestic Fin. of the Comm. on Banking and Currency*, 88th Cong. 5 (1964) [hereinafter AD HOC REPORT].

¹³⁷ *Id.* at 4.

¹³⁸ *Id.* at 7, 10,

¹³⁹ For another analysis of the events of 1953, see KENNETH D. GARBADE, *AFTER THE ACCORD: A HISTORY OF FEDERAL RESERVE OPEN MARKET OPERATIONS, THE US GOVERNMENT SECURITIES MARKET, AND TREASURY DEBT MANAGEMENT FROM 1951 TO 1979*, at 107–124 (2021).

¹⁴⁰ Dudley G. Lockett, “*Bills Only*”: *A Critical Appraisal*, 42 REV. ECON. & STAT. 301 (1960).

its purchases of government securities to the short end of the yield curve. Further, the Fed would purchase government securities “solely to effectuate the objectives of monetary and credit policy.”¹⁴¹ Thus, the Committee explicitly disavowed “support[ing] any pattern of prices and yields in the Government securities market.”¹⁴² Importantly, however, they left room for “correcting a disorderly situation in the Government securities market.”¹⁴³ This new policy, Chairman Martin later explained, amounted to the Fed “regain[ing] its influence over the volume of money” by no longer “abet[ting] inflationary overexpansion of the money supply.”¹⁴⁴

The timing was bad. By late March, rumors were circling that the Treasury was primed to sell thirty-year debt for the first time since 1945,¹⁴⁵ and the following month a new bond maturing in 1983 was formally announced. The Treasury described the decision as “one step” along the path towards more stable debt management¹⁴⁶—a core promise in Eisenhower’s first State of the Union Address.¹⁴⁷ The press

¹⁴¹ Fed. Open Mkt. Comm. Meeting Minutes 32 (Mar. 4, 1953), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19530305.pdf> [<https://perma.cc/MKZ4-6MFX>].

¹⁴² *Id.* at 38.

¹⁴³ *Id.* at 22. This was a material change to the operating policy of the FOMC, which had previously sought to maintain “orderly conditions” in the Government securities market. S. REP. NO. 82-123, at 353 (1952); Fed. Open Mkt. Comm. Meeting Minutes 42 (Mar. 4, 1953), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19530305.pdf> [<https://perma.cc/HWY8-ZM4Q>].

¹⁴⁴ Martin, *supra* note 137, at 3.

¹⁴⁵ *Rumors of New Treasury Moves Help to Depress U.S. Bond Prices*, N.Y. TIMES, Mar. 26, 1953.

¹⁴⁶ U.S. DEP’T OF THE TREASURY, STATEMENT BY SECRETARY OF THE TREASURY GEORGE M. HUMPHREY (1953).

¹⁴⁷ Dwight D. Eisenhower, State of the Union Address, Delivered at a Joint Session of Congress (Feb. 2, 1953), https://www.eisenhowerlibrary.gov/sites/default/files/file/1953_state_of_the_union.pdf [<https://perma.cc/T6RW-AAD7>] (“Past differences in policy between the Treasury and the Federal Reserve Board have helped to encourage inflation. Henceforth, I expect that their single purpose shall be to serve the whole Nation by policies designed to stabilize the economy and encourage the free play of our people’s genius for individual initiative.”).

hailed it as of “major significance,” honoring a “campaign pledge” by the President to “finance as much as possible the Government’s operating deficit . . . from the public’s savings, and away from the money-creating mechanism of the commercial banking system.”¹⁴⁸

Although the new bond opened trading at a small premium—demand was described as “firm”¹⁴⁹—by late April, prices had fallen below par.¹⁵⁰ Press reports placed the blame¹⁵¹ squarely on excess buying from “temporary—that is, speculative—investors,” exacerbated by insufficient screening and pro-rated allotments by the Treasury.¹⁵² By early May, trading among government securities dealers “came to a virtual standstill” with “heaviness” across the full range of maturities.¹⁵³ At a May 6 meeting, Robert Rouse, manager of the System Open Market Account (SOMA), told the FOMC plainly that there was “virtually no market for government securities at the present time.”¹⁵⁴ Stress in Treasuries spread to the broader bond market, which was reportedly “weak” with “light turnover”¹⁵⁵ (referring to less trading activity than normal). One blue-chip issuer (Southern Bell) took the highly unusual step of rejecting all bids for its \$30 million issuance

¹⁴⁸ Paul Heffernan, *New U.S. Bond Seen of Major Import*, N.Y. TIMES, Apr. 12, 1953.

¹⁴⁹ Paul Heffernan, *New 30-year Bond is Quoted at 100¼*, N.Y. TIMES, Apr. 16, 1953.

¹⁵⁰ The 3.25% of 1978-83 bonds were quoted at 99-24/99-28 on April 27, 1953. *U.S. Government and Agency Bonds*, N.Y. TIMES, Apr. 28, 1953, at 40.

¹⁵¹ In total, the Treasury received roughly \$6 billion of bids for the 1983 issue, of which roughly \$750 million were rejected to curb speculative involvement. The remainder were allotted 20% of their bids with minor adjustments to small orders. *Treasury Awards \$1,000,080 of 3.25% Issue on a 20% Quota Basis*, N.Y. TIMES, April 22, 1953, at 46.

¹⁵² Paul Heffernan, *Bond Performance Stumps Observers*, N.Y. TIMES, May 10, 1953, at F1.

¹⁵³ *U.S. Bond Trading Near Standstill*, N.Y. TIMES, May 5, 1953, at 43.

¹⁵⁴ Fed. Open Mkt. Comm. Meeting Minutes (May 6, 1953), <https://www.federalreserve.gov/monetarypolicy/files/FOMChminec119530506.pdf> [<https://perma.cc/QDU7-AZZU>].

¹⁵⁵ *U.S. Bond Trading Near Standstill*, *supra* note 155.

in early May, opting to come back to the market at a later date.¹⁵⁶

The Fed was in a bind. In the pre-Accord world, the FOMC would likely have authorized the New York Fed to intervene directly to buy Treasuries. But the Committee had just committed to buy government debt only to “correct disorderly conditions.”¹⁵⁷ Policymakers and market participants understood this to be a relatively high standard.¹⁵⁸ That said, it had arguably been met. At the May 13 meeting of the FOMC Executive Committee, Ralph Young, director of Research and Statistics for the Board of Governors, expressed concern that conditions in bond markets were negatively impacting the broader economy.¹⁵⁹ Reflecting this setup, the Fed’s initial response focused on alleviating tightness in the money markets by deploying their repo authority.¹⁶⁰ Rouse in

¹⁵⁶ *Market in Bonds Flounders Again*, N.Y. TIMES, May 6, 1953, at 47 (“The rejection of the bids marked the first time within the memory of bond men that a sale of high-grade bonds of investment quality had been called off after banking syndicates had put in sealed bids whose area of competitive price appear to reflect market conditions closely. The issuing company said that the bids were not accepted out of a wish to study market conditions further.”).

¹⁵⁷ *The Federal Reserve System After Fifty Years: Hearing Before the Subcomm. on Domestic Fin. of the Comm. on Banking and Currency*, 88th Cong. 2016 (1964) (Federal Open Market Comm. report of Ad Hoc Subcomm. on the Gov’t Sec. Mkt, November 12, 1952).

¹⁵⁸ This condition was presumed to be rare, generally associated with a declining market (i.e., rising yields) and characterized by “selling [that] feeds on itself so rapidly and so menacingly that it discourages both short covering and the placement of offsetting new orders by investors who ordinarily would seek to profit from purchases made in weak markets” that, if left unchecked, can create “panic conditions.” *Id.*

¹⁵⁹ Fed. Open Mkt. Comm. Meeting Minutes 4 (May 13, 1953), <https://www.federalreserve.gov/monetarypolicy/files/FOMChminec119530513.pdf> [<https://perma.cc/7SMS-BFFR>] (“[T]here has been a substantial adjustment in interest rates, especially in the longer term market, which has affected the liquidity position of the economy substantially” and the shock to interest expense could be “affect[ing] plans for [business] capital expenditures.”).

¹⁶⁰ Approved by the FOMC earlier that year. Fed. Open Mkt. Comm. Meeting Minutes 7 (March 4, 1953),

particular appeared to prefer repo to outright purchases.¹⁶¹ By the end of May, there were \$215 million of repos outstanding¹⁶² to complement \$225 million of bill purchases over the course of the month.¹⁶³

Relief from these interventions lasted only days, with volatility spiking again in early June.¹⁶⁴ Poor sentiment was probably exacerbated by the realization that the deficit, already at a post-War high for the 1953 fiscal year that ended in June, was likely to widen further and put much greater pressure on the Treasury to source additional funds—as much as \$15 billion for July through year-end,¹⁶⁵ or more than 4% of 1952 nominal GDP.¹⁶⁶ Dealers struggled with the sharp increase in yields and volatility; the press described them as “punch-drunk” and unable to take on additional inventory,¹⁶⁷ a condition many believed was “critical” and reaching “nearly panic proportions.”¹⁶⁸ The strain was reflected in transaction

<https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19530305.pdf> [<https://perma.cc/9CFN-4PJV>].

¹⁶¹ Fed. Open Mkt. Comm. Meeting Minutes 7, 15 (May 13, 1953), <https://www.federalreserve.gov/monetarypolicy/files/FOMChminec119530513.pdf> [<https://perma.cc/VUT8-DJFF>].

¹⁶² Data on government securities held under repurchase agreements is available on a weekly (as of Wednesday), month-end, and daily-average by month basis in the Federal Reserve Bulletin.

¹⁶³ Ctr. for Fin. Stability, *Resources and Assets: U.S. Government Securities: Bought or Held Outright: U.S. Bills*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/RAGSOUSB> [<https://perma.cc/TSP3-FANS>] (last visited May 22, 2023).

¹⁶⁴ Inferred from daily closing levels for Treasury securities published by the New York Times in their “U.S. Government and Agency Bonds” section. *Week’s Transactions in Bonds and Stock exchange*, N.Y. TIMES, May 31, 1953, at 113, <https://timesmachine.nytimes.com/timesmachine/1953/05/31/issue.html>].

¹⁶⁵ Paul Heffernan, *‘53 Treasury Need Put at \$15 Billion*, N.Y. TIMES, May 31, 1953, at 1.

¹⁶⁶ U.S. Bureau of Econ. Analysis, *Gross Domestic Product*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/GDP> [<https://perma.cc/3KCE-JE3H>] (last visited Feb. 23, 2023).

¹⁶⁷ Paul Heffernan, *Treasury Set Back by Slump in Bonds*, N.Y. TIMES (June 7, 1953).

¹⁶⁸ S. REP. NO. 88-2500, at 30 (1958).

costs¹⁶⁹ for trading the recently issued bonds (often referred to as simply “3¼s” in reference to their coupon rate), which were relatively steady through April and May but doubled in June.¹⁷⁰ Soon equity markets began to crack under the pressure of rapidly rising yields.¹⁷¹

The fever broke only after much more aggressive Fed intervention, including \$500 million of further bill purchases¹⁷² and, perhaps more importantly, a reduction of statutory reserve requirements.¹⁷³ This cocktail produced what was at the time described as the “biggest show of strength” for the bond market since 1951.¹⁷⁴ By the first week of July, the 3¼s were once again trading near par and transaction costs had normalized. By the end of the month, prices were higher, and bid/ask spreads were tighter than they had been in April.¹⁷⁵ Daily volatility in generic long-term

¹⁶⁹ These are typically derived from the “spread” between the “bid” (price at which dealers are willing to buy) and the “ask” (price at which they are willing to sell) quotes in the secondary market. Because they structure these bids to buy slightly below the market price and sell slightly above, dealers compensate themselves for taking risk relative to their intermediation activity.

¹⁷⁰ From 4/32nd to 8/32nd on June 1, 1953. *U.S. Government and Agency Bonds*, N.Y. TIMES, May 21, 1966.

¹⁷¹ See, e.g., *Stock Prices Crack on U.S. Bond Slump*, N.Y. TIMES, Jun. 2, 1953, at 43.

¹⁷² Ctr. for Fin. Stability, *Resources and Assets: U.S. Government Securities: Bought or Held Outright: U.S. Bills*, FED. RSRV. ECON. DATA (Feb. 10, 2021), <https://fred.stlouisfed.org/series/RAGSOUSB> [<https://perma.cc/TSP3-FANS>].

¹⁷³ Discussion at the June 1993 Executive Committee meeting reveals that the reduction in reserve requirements was motivated rather explicitly by the Treasury’s financing needs. See Fed. Open Mkt. Comm. Meeting Minutes (June 23, 1993), <https://www.federalreserve.gov/monetarypolicy/files/FOMChminec119530623.pdf> [<https://perma.cc/UXV8-TSG4>].

¹⁷⁴ This move produced the largest one-day price gain for many Treasury bonds since 1951. *U.S. Securities Soar in Response to Reserve’s Money-Easing Move*, N.Y. TIMES, Jun. 26, 1953, at 27.

¹⁷⁵ The 3¼ bond traded in a 8/32nd starting May 30, 1953 and persisted there until narrowing 6/32nd on June 22, again to 4/32nd on July 5, and finally to 2/32nd on July 15. From various daily issues of the “U.S. Government and Agency Bonds” section of the NYTimes.

Treasury bonds in July was below 1 basis point per day, relative to 2.4 basis points per day in June.¹⁷⁶

It was, in fact, the largest intervention to support the functioning of government securities markets since the outbreak of the Second World War.¹⁷⁷ The bond market had

¹⁷⁶ Data is drawn from various issues of the New York Times, which carried specific issue prices of U.S. Government Bonds daily). *See, e.g., U.S. Government and Agency Bonds*, N.Y. TIMES, Jun. 5, 1953, at 36. Generic prices are drawn from monthly Treasury Bulletins. *See, e.g., U.S. DEPT OF THE TREASURY, Capital Movements*, BULL. OF THE TREASURY DEP'T, July 1953, at 55.

¹⁷⁷ World War II formally began on September 1, 1939 with the invasion of Poland by Germany. Britain and France declared war two days later. Events in Europe precipitated a substantial rise in Treasury yields, with selling dominated by private investors and smaller institutional holders (including many banks). As the New York Fed later recalled in its annual report: "Rather than run the risk to the whole banking system, and to the capital market, of such selling feeding on itself, the Federal Reserve System, under the direction of the Federal Open Market Committee, and acting through this bank, placed bids in the market for Government direct and guaranteed securities." FED. RSRV. BANK OF N.Y., TWENTY-FIFTH ANNUAL REPORT FOR THE YEAR ENDED DECEMBER 31, 1939, at 18 (1940). Those purchases were expressly designed to facilitate orderly market functioning, rather than "peg" yields. In total, the Fed bought nearly \$500 million in government securities over the first few weeks of hostilities, with some small additional purchases in subsequent weeks. *Id.* The vast majority of those purchases were in longer maturities. *U.S. Government and Agency Bonds*, N.Y. TIMES, Jun. 5, 1953, at 36; Bd. Of Governors of the Fed. Rsrv. Sys., *Effects of War on American Markets Compilation of Laws Relating to Branch Banking Distribution of Demand Deposits by Economic Classes*, 25 FED. RSRV. BULL., 839 (1939). That prompted a broader discussion among members of the FOMC of the principles underlying interventions designed to stabilize prices in the government securities market, rather than implementing monetary policy. Ultimately the Committee authorized the executive committee to use its discretion in making purchase "in its judgment from time to time may be necessary for the purpose of exercising an influence toward maintaining orderly market conditions" (up to a limit of \$500 million, that is). Fed. Open Mkt. Comm. Meeting Minutes, at 5–12 (June 11, 1953), <https://fraser.stlouisfed.org/title/federal-open-market-committee-meeting-minutes-transcripts-documents-677/meeting-june-11-1953-22733/content/pdf/19530611MinutesECv> [https://perma.cc/6B9N-HRJG]. For further discussion, see KENNETH D. GARBADE, AFTER THE ACCORD: A HISTORY OF FEDERAL RESERVE OPEN MARKET OPERATIONS, THE

clearly failed its first post-Accord test—it was, in the words of one reporter, “not yet able to function effectively on a completely free basis.”¹⁷⁸ Treasury markets clearly lacked the “depth, breadth, and resiliency” required to fulfill the promise of the Accord.¹⁷⁹ Rather, seldom had they shown less liquidity in the judgement of Allan Sproul, the outspoken and influential President of the Federal Reserve Bank of New York.¹⁸⁰

The events of May and June 1953 revealed that private intermediaries were not yet up to the task of supporting the Treasury market without help from the central bank.¹⁸¹ To correct what arguably became a “disorderly” situation, the Fed eased monetary conditions substantially, increasing the money supply by both expanding their balance sheet and reducing statutory reserve requirements.¹⁸² That retreat meant a return to money-financing the deficit. The real heroes of the bond market in 1953 turned out to be commercial banks, which bought more than half of the net supply in the second half of the year. Combined with the Fed, that meant banks owned 57% of marketable debt outstanding year-end

U.S. GOVERNMENT SECURITIES MARKET, AND TREASURY DEBT MANAGEMENT FROM 1951 TO 1979, at 68–70 (2020).

¹⁷⁸ Paul Heffernan, *U.S. Bond Market Too Thin for Task*, N.Y. TIMES, Jul. 12, 1953.

¹⁷⁹ AD HOC REPORT, *supra* note 139, at 2007.

¹⁸⁰ Fed. Open Mkt. Comm. Meeting Minutes (June 11, 1953), <https://fraser.stlouisfed.org/title/federal-open-market-committee-meeting-minutes-transcripts-documents-677/meeting-june-11-1953-22733/content/pdf/19530611MinutesECv> [<https://perma.cc/Q5V4-GG27>].

¹⁸¹ “Backing and filling by the authorities has been a source of repeated bewilderment and discouragement to the private dealers.” Heffernan, *supra* note 181.

¹⁸² Writing several years later, Asher Achinstein observed: “The May [1954] shift in Federal Reserve policy from credit restraint to credit ease was not due primarily, as is sometimes asserted, to the expectation by the monetary authorities that the economy was about to slip into a business recession which it was deemed desirable to counteract. The measures designed to ease credit were initially undertaken rather in response to a critical situation that had been permitted to develop in the financial markets—a situation that was frequently described as reaching nearly panic proportions.” S. REP. NO. 88-2500, at 30 (1958).

(comparable to the end of 1952).¹⁸³ This outcome was arguably a poor way to manage the business cycle, described by one observer as akin to “wielding a butcher’s cleaver when the needs of the sensitive economy called for a dentist’s drill.”¹⁸⁴ As a result, some at the time concluded that monetary policy makers had found themselves captive to fiscal policy—as one senior banker put it, the Fed was “the prisoner of the Treasury’s necessities.”¹⁸⁵

C. The Rise of the Fed Repurchase Facility

The rapid breakdown in the Treasury market following the Fed’s exit led senior officials to conclude that government securities dealers were not yet able to stand on their own two feet. As Chairman Martin put it, the free market had failed its “first and more difficult test.”¹⁸⁶ A liquid market in Treasuries, Martin acknowledged, depended on dealers not just brokering transactions, but also holding positions in inventory.¹⁸⁷ The events of May and June 1953, in turn, made

¹⁸³ Fed. Rsrv. Bank of St. Louis, *L.210 Treasury Securities*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/release/tables?rid=52&eid=809048&od=1953-10-01#> [https://perma.cc/9QSM-AKL5].

¹⁸⁴ Heffernan, *supra* note 181.

¹⁸⁵ *United States Monetary Policy: Recent Thinking and Experience: Hearing Before the Subcomm. on Econ. Stabilization of the Joint Comm. on the Econ. Rep.*, 83rd Cong. 62 (1954) (statement of James N. Land, Senior Vice President, Mellon National Bank and Trust Co.).

¹⁸⁶ *United States Monetary Policy: Recent Thinking and Experience: Hearing Before the Subcomm. on Econ. Stabilization of the Joint Comm. on the Econ. Rep.*, 83rd Cong. 62 (1954) (reply of William M. Martin, Chairman of the Board of Governors of the Federal Reserve System).

¹⁸⁷ In prepared responses to questions submitted to Congress by the Federal Reserve, Martin observed: “When market conditions are such that approximate supply and demand estimates cannot be made, the continuity and sensitiveness of the market is seriously impaired . . . [dealers] tend to confine their role to that of brokers, operating mainly on a commission basis. In this role, they offer to find buyers for issues pressed for sale, and other sellers for issues in demand, but they do not themselves purchase or sell securities at their own risk. They do not, therefore, perform the function of giving breadth and continuity to the market by their willingness to take securities into position.” *Id.* at 20.

it clear that they would not do so at a scale commensurate with the market's needs. Martin and his colleagues decided that the solution lay in the financing of trading inventories. Repo was already on their minds as a useful tool in achieving those goals.¹⁸⁸

To understand the Fed's decision to use repos to support nonbank dealer firms, it is helpful to start with some context. As originally conceived, the Fed was strictly limited to banking banks. This limit reflected its origins as a means to provide "an elastic currency,"¹⁸⁹ rigidities in which were thought to have caused panics like that of 1907.¹⁹⁰ The Fed was therefore authorized to provide liquidity via advances and discounts to banks which were "members"; nonmembers were allowed only indirect support, via the general stability provided by the System and member banks, which could on-lend.¹⁹¹ Although, in 1913, some consideration was given to allowing nonbank access to the Fed under certain, limited circumstances, this approach was ultimately rejected.¹⁹²

¹⁸⁸ In March 1951, at a meeting of the FOMC around the time the Accord was announced, Woodlief Thomas, who was an economist at the Board of Governors, noted that repos were "very useful in helping to develop a freer market, particularly if a situation developed where the money market was tight, and dealers had to take in bills." Fed. Open Mkt. Comm. Meeting Minutes (Mar. 8, 1951), <https://www.federalreserve.gov/monetarypolicy/files/FOMChminec119510308.pdf> [<https://perma.cc/8G5K-HVJK>]. At the same meeting, Allan Sproul speculated that repo "might be of greater use in a period such as that immediately ahead." *Id.* at 4.

¹⁸⁹ Federal Reserve Act, Pub. L. No. 63-43, 38 Stat. 251 (1913).

¹⁹⁰ Jon Moen, *Panic of 1907*, EH.NET (Aug. 14, 2001), <http://eh.net/encyclopedia/the-panic-of-1907/> [<https://perma.cc/XK3P-ZUYE>].

¹⁹¹ Federal Reserve Act § 19, Pub. L. No. 63-43, 38 Stat. 251 (1913). Section 19 of the original act prohibits member banks from acting as a "medium or agent" for nonmember banks seeking access to credit provided by Federal Reserve banks, but importantly includes an exception if such lending is authorized by the Federal Reserve Board. *Id.*

¹⁹² At the time, Senator M. F. Phelan of Massachusetts stated clearly that the Fed should "make no loans and receive no deposits from individuals." HOWARD HACKLEY, LENDING FUNCTIONS OF THE FEDERAL RESERVE BANKS 261 (1973).

Following the breakdown in 1953, leading Fed officials agreed that the transition to the free market in Treasuries promised by the Accord necessitated some form of central bank support for dealers in government securities. To keep investor-owned businesses in the game of intermediating the Treasury market, they reasoned, dealing in Treasuries had to remain consistently profitable. That required access to financing at lower rates than the secondary market yielded on their inventories—a so-called positive carry profile. In the years leading up to and immediately following the Accord, short-term Treasury (“T-Bill” or “Bill”) yields were generally below the Fed’s discount rate for member banks and by extension the money market bank loans securities dealers typically used to finance their operations, which in the view of the Fed and others limited their capacity to hold inventory and therefore to intermediate more generally.¹⁹³ Achieving “depth, breath, and resiliency” in the government securities market, the Ad Hoc Report concluded, required a liquidity backstop for dealers in government securities—a version of the lender of last resort role the Fed performed with commercial banks.¹⁹⁴ In practice, this meant a more general source of financing designed to maintain the profitability of

¹⁹³ A Federal Reserve Staff Report cites concerns about the impact of negative carry on dealer inventories and stability in the Treasury market raised in the immediate post-War years by Governor Rouse. KENNETH GARBADE, FED. RESERVE BANK OF N.Y., STAFF REPORTS NO. 780, REPURCHASE AGREEMENTS AS AN INSTRUMENT OF MONETARY POLICY AT THE TIME OF THE ACCORD 11 (2016) (citing Fed. Open Mkt. Comm. Meeting Minutes 4–5 (Dec. 9, 1947), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19471209.pdf> [<https://perma.cc/7RM5-EPFC>]). The Ad Hoc Report also cites nonbank funding costs that “penalize their function as dealers” which, in addition to “the usual market risks,” force them to assume “the burden of negative carry,” leading them to “limit their position in the market” and prevents them from absorbing the requisite volume when “market pressures are most severe.” AD HOC REPORT, *supra* note 139, at 2053.

¹⁹⁴ Lev Menand, *The Federal Reserve and the 2020 Economic and Financial Crisis*, 26 STAN. J. L. BUS. & FIN. 295, 305–06, 305 n.32 (2021).

their activities in a market still prone to “disorderly situation[s].”¹⁹⁵

How precisely to provide that financing, however, was the subject of some controversy. The problem lay in the fact that the vast majority of dealing in government securities in the years immediately following the Accord was facilitated by nonbank firms.¹⁹⁶ Not only did these firms lack access to deposit funding that supported traditional banking activities, they also lacked access to the Fed’s discount window. To create the sort of orderly conditions Fed officials had guaranteed the Treasury, these dealers would need significantly more balance sheet elasticity on an ongoing basis (i.e., not just during periods of acute stress) and at times at rates below the discount rate offered to member banks.

Importantly, restrictions on FRB extensions of credit to nonbanks had been loosened in the economic and financial crisis of the 1930s. The first (and today the most famous¹⁹⁷) such amendment was paragraph 3, which was added to Section 13 of the Federal Reserve Act in the Emergency Relief and Construction Act of 1932. Section 13(3) authorized

¹⁹⁵ Fed. Open Mkt. Comm. Meeting Minutes (Mar. 5, 1953), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19530305.pdf> [<https://perma.cc/E79C-MEMH>].

¹⁹⁶ More anecdotally, the Ad Hoc Report references “about 20 dealers, including some banks with trading departments,” and a later report quoting Congressional testimony from 1959 notes five out of the seventeen active government securities dealers were bank affiliates. AD HOC REPORT, *supra* note 139, at 2009; *A Study of the Dealer Market for Federal Government Securities: Materials Prepared for the Joint Econ. Comm.*, 86th Cong. 2 (1960). Statistics of the bank versus non-bank share of government securities dealing are hard to come by. The first concrete statistics to clearly appear in the record date from a 1964 report published in Fed. Rsrv. Bank of N.Y., *Monthly Review: June 1964*, 46 FED. RSRV. BANK OF N.Y. MONTHLY POL’Y REV. 27 (1964).

¹⁹⁷ Facilities authorized by §13(3) were at an important part of the Federal Reserve’s response to both the Global Financial Crisis of 2008 and the 2020 COVID pandemic. See Frederic S. Mishkin & Eugene N. White, *Unprecedented Actions: The Federal Reserve’s Response to the Global Financial Crisis in Historical Perspective* (Nat’l Bureau of Econ. Rsch., Working Paper No. 20737, 2014).

lending (via discounting¹⁹⁸) to “individuals, partnerships and corporations.” But Congress required that the Fed invoke this provision only following a determination by its Board of “unusual and exigent circumstances.”¹⁹⁹ Moreover, Congress required that the FRBs secure “evidence” that prospective borrowers are not able to “secure adequate credit accommodations from other banking institutions” (the so-called credit availability proviso).²⁰⁰ These showings were arguably nonstarters in the early 1950s, when conditions were far from “exigent” and government securities dealers generally had access to credit from the private market at reasonable—if not optimal—prices.²⁰¹

Broader lending powers to nonbanks were also available to the Federal Reserve banks under the less well-known §13(13).²⁰² Congress added this provision as part of the

¹⁹⁸ Advances involve the purchase of promissory notes issued by member banks (often with attached collateral agreements, including Treasuries) by Federal Reserve banks, whereas discounts involve the direct purchase of securities from those same member banks. HACKLEY, *supra* note 195, at 83.

¹⁹⁹ Letter from Charles Hamlin to Carter Glass (July 9, 1932), in Parinitha Sastry, *The Political Origins of Section 13(3) of the Federal Reserve Act*, FED. RSRV. BANK OF N.Y. ECON. POL'Y REV., Sept. 20, 2018, at 1, 20.

²⁰⁰ 12 C.F.R. § 201.4.

²⁰¹ Historically, dealers had relied on money market loans offered by commercial banks to finance their activities (e.g., loans for carrying and purchasing securities). BD. OF GOVERNORS OF THE FED. RSRV. SYS., BANKING AND MONITORING STATISTICS 1941–1970, at 50 (1976). A report on consultations with dealers published in July 1959 notes that “two of the large New York City banks generally stand ready to finance dealers with call loans” and “several other large New York City banks will also at times make call loans to dealers at preferential rates.” As a result, numerous dealers (preferentially from “large organizations”) had “no problem in obtaining all of the credit needed from money market banks (even in periods of money stringency).” US. DEP'T OF THE TREASURY AND THE FD. RSRV. SYS., TREASURY-FEDERAL RESERVE STUDY OF THE GOVERNMENT SECURITIES MARKET: PART I, at 31 (1959).

²⁰² Sometimes referred to as “the last paragraph of Section 13.” FED. RSRV. SYS., FEDERAL OPEN MARKET COMMITTEE RULES AND AUTHORIZATIONS 13 (2021).

Emergency Banking Act of 1933.²⁰³ As with Section 13(3), Section 13(13) allows FRBs to lend to “individuals, partnerships, and corporations,” but in this case through advances secured by “direct obligations of the United States”²⁰⁴ and without evidence of unusual or exigent circumstances (or a lack of credit availability). Section 13(13) in principle is open to an expansive interpretation that would permit ongoing lending to dealer firms.²⁰⁵ Such lending, however, would not have been governed by the FOMC. Instead, it would have been a matter for individual Reserve Banks under the supervision of the Board. The Fed had made little use of this authority prior to the 1953 breakdown,²⁰⁶ and did not explicitly consider it as a way to support dealers that year. Moreover, in 1955, the Board formally restricted 13(13) powers by revising its regulations²⁰⁷ to state that “it is not the practice to make advances to others than member banks

²⁰³ Emergency Banking Relief Act, Pub. L. No. 73-1, Public Law 73-1, 48 Stat. 1 (1933).

²⁰⁴ *Id.*

²⁰⁵ As recounted in HACKLEY, *supra* note 195, at 122, public comments at the time suggest the original intent of the provision was to provide a way for State banks to secure credit, *see, e.g., id.* (quoting comments by Senator Carter Glass during deliberations of the Emergency Banking Act of 1933). However, the language used to incorporate these expanded lending powers into Regulation A were somewhat ambiguous and allowed for a broader interpretation. Bd. of Governors of the Fed. Rsrv. Sys., *Regulation on Discounts by federal Reserve Banks*, 23 FED. RSRV. BULL. 986 (1937). This ambiguity was clarified in the 1955 revisions which note it was “not the practice to make advances to others than member banks except in unusual or exigent circumstances.” Bd. of Governors of the Fed. Rsrv. Sys., *Law Department Review of Changes to Regulation A: Advances and Discounts by Federal Reserve Banks*, 41 FED. RES. BULL. 1, 9 & n.1 (1955).

²⁰⁶ The Fed used its newly added nonbank lending powers very sparingly in the 1930s, with only \$1.5 million in total lending from 1932 to 1936, compared to roughly \$7 billion overall growth in the size of their balance sheet over the same period. BD. OF GOVERNORS OF THE FED. RSRV. SYS., *LENDING FUNCTIONS OF THE FEDERAL RESERVE BANKS: A HISTORY* (1973).

²⁰⁷ *See* Regulation A, “Extensions of Federal Reserve Bank Credit,” 12 C.F.R. pt. 201.

except in unusual or exigent circumstances.”²⁰⁸ And perhaps more importantly, the Board set the minimum rate on 13(13) advances above the highest discount rate offered to member banks, a rate which would have to be substantially lowered to address concerns around negative carry on dealer inventories.²⁰⁹

Accordingly, when it came to providing subsidized credit to government securities dealers, officials turned to Section 14. Section 14 authorizes the Federal Reserve banks to “purchase and sell” a variety of securities “in the open market” (frequently referred to as open market operations) with a wide range of market participants—not just banks. On its face, Section 14 is not a lending authority. But in 1917, the Board struck on it as means to handle the unforeseen consequences of a provision in the War Revenue Act that levied a stamp tax on the promissory notes of banks. When applied to debt (including Treasury debt) used as collateral in exchange for short-term advances by the Reserve Banks,²¹⁰ the stamp tax made Reserve Bank advances uneconomic as a source of liquidity. This consequence threatened the stability of the government bond market, since subsidized lending to member banks to buy Treasuries was a significant component of public finance strategy at the time.²¹¹

²⁰⁸ See Bd. of Governors of the Fed. Rsrv. Sys, *Law Department*, 41 FED. RSRV. BULL. 8, 11 (1955). This is particularly notable considering at this point, as is discussed herein, the Fed had already committed to support nonbank dealer intermediation in government bond markets and was actively expanding its use of repo funding under Section 14.

²⁰⁹ Bd. of Governors of the Fed. Rsrv. Sys., *Regulation on Discounts by Federal Reserve Banks*, 23 FED. RES. BULL. 965, 978 (Oct. 1937).

²¹⁰ Fed. Res. Bank of N.Y., *Stamp Tax on Promissory Notes*, 92 FED. RSRV. BANK OF N.Y. CIRCULARS (1917).

²¹¹ In December 1917, motivated by the “extensive fiscal operations which will be undertaken by the government during the period of war,” the Federal Reserve Board initiated weekly collection of balance sheet data from member banks. See Bd. Of Governors of the Fed. Rsrv. Sys., *Review of the Month*, 3 FED. RSRV. BULL. 917, 921 (1917). The first report showed member banks owning roughly more than \$1.7 billion of U.S. government debt and \$374 million of loans secured by the same, or roughly 25% of all interest-bearing liabilities of the federal government. See Scott Konzem, Virginia Lewis, Suzanna Stephens, Gretchen Weinbach & Michael Zhang,

The Board—while awaiting a legislative fix—identified Section 14 as a workaround. The FRBs would purchase government debt under an agreement to resell it to the borrower fifteen days later at a slightly higher price—thus providing the economic equivalent of financing secured by the underlying bond but without the need to issue a promissory note (subject to the tax).²¹² Although intended to support member banks, some FRBs began to use repurchase agreements also to finance nonmember banks that held Liberty bonds.²¹³ A couple of years after the Armistice, as McAdoo’s “powerful stream of romanticism” had waned but the burdens of war debt remained, the Federal Reserve Bank of New York in particular looked to expand repo availability to non-bank dealers.²¹⁴ The first such transaction secured by Treasury collateral occurred in April 1920 as part of a

The 104th Anniversary of the Federal Reserve’s Oldest Data Collection, Bd. OF GOVERNORS OF THE FED. RSRV. SYS. (JUNE 21, 2021), <https://www.federalreserve.gov/econres/notes/feds-notes/the-104th-anniversary-of-the-federal-reserves-oldest-data-collection-20210621.html> [<https://perma.cc/SWT3-AKKQ>].

²¹² Specifically, the Board notified the regional banks that “eligible paper” may be rediscounted “without additional stamps” and that “if they desire to do so they may resell such paper with [a] customary rebate of unearned discount.” Telegram of Gov. Harding to the Federal Reserve Agents (Nov. 28, 1917), <https://fraser.stlouisfed.org/archival-collection/records-federal-reserve-system-1344/repurchase-paper-1917-1922-540595> [<https://perma.cc/E763-M2YY>].

²¹³ Letter from the Governor of the Fed. Rsrv. Bd. to all Governors of the Fed. Rsrv. Bd., (July 22, 1918), <https://fraser.stlouisfed.org/archival-collection/mimeograph-letters-statements-board-4957/letter-governor-govs-federal-reserve-banks-re-discount-commercial-paper-longer-maturities-agreement-repurchase-within-15-days-512103> [<https://perma.cc/RT4A-CHNF>]; Bd. of Governors of the Fed. Rsrv. Sys., *Average Rate and Maturity of Paper Discounted by the Federal Reserve banks Each Month*, 4 FED. RSRV. BULL. 551 (1918).

²¹⁴ The first dealer repos were focused on the bankers’ acceptance market. FOURTH ANNUAL REPORT OF THE FEDERAL RESERVE BANK OF NEW YORK, at 15 (1919). In their 1920 Annual Report, the Board of Directors also recalled that, “in the early spring of that year,” the New York Fed began facilitating dealer operations “by means of purchase and resale agreements . . . making moderate advances against certificates.” FIFTH ANNUAL REPORT OF THE FEDERAL RESERVE BANK OF NEW YORK, at 17 (1920).

concerted effort to improve the functioning of the government bond market in anticipation of upcoming maturities of large wartime bond issues—and at rates noticeably below discounts at the time.²¹⁵

This new use sparked controversy,²¹⁶ but after several years of struggle between Fed officials, in 1925, the Board reaffirmed its view that these transactions were legally authorized²¹⁷—in contrast to views previously expressed by

²¹⁵ Data compiled for a Congressional hearing in 1931 indicates that the first “sales contract agreement with dealers” in government securities was offered on April 13, 1920 at a rate of 5-1/8% and remained there even as discount rates were increased from 6% (set on January 23, 1920) to 7% (as of June 1, 1920). *Operation of the National and Federal Reserve Banking Systems, Hearing on S. Res. 71 Before a Subcomm. of the Comm. on Banking and Currency, 71st Cong. 821 (1931).*

²¹⁶ In late-1921, in response to a suggestion by Benjamin Strong, then the Governor of the New York Fed, that dealer repo be expanded across the System, Governor Crissinger asked the Board’s General Counsel, Walter Wyatt to opine on their “legality.” In an opinion issued August 18, 1923, Walter Wyatt (General Counsel to the Board of Governors) concluded that the mandatory nature of the closing leg of a repo rendered the initial transaction in a repo a “loan” rather than a “purchase,” and furthermore that repurchase agreements could not be construed as promissory notes under §13 of the Federal Reserve Act. According to Wyatt, repos were very likely “in legal effect merely a loan secured by collateral, and not a sale” and their use in the way that New York was contemplating was “manifestly inconsistent with the purposes of the [Federal Reserve] Act.” Memorandum from Walter Wyatt, General Counsel of the Federal Reserve Board, to Daniel Crissinger, Governor of the Federal Reserve Board 10 (Aug. 18, 1923) (on file with the Columbia Business Law Review); Letter from George Vest, General Counsel to the Bd. of Governors of the Fed. Rsrv., to Exec. Committee of the Fed. Open Mkt. Comm., Oct. 1, 1954, available at <https://fraser.stlouisfed.org/archival-collection/records-federal-reserve-system-1344/discount-rates-operations-fr-banks-repurchase-paper-1942-1958-540597>. Wyatt’s views were not shared by some Reserve Bank Legal Departments (“I have been advised by Counsel for several of the Federal reserve banks that they concur in this view, though some of the other counsel disagree with me.”), but he held firm. Memorandum from Walter Wyatt, General Counsel of the Federal Reserve Board, to Daniel Crissinger, Governor of the Federal Reserve Board 2, 4–5 (Nov. 3, 1923) (on file with the Columbia Business Law Review).

²¹⁷ Bd. of Governors of the Fed. Rsrv. Sys. Meeting Minutes, at 5 (Mar. 5, 1925),

its own General Counsel.²¹⁸ The Fed's use of this de facto lending power expanded into the early-1930s, driven by the Federal Reserve Bank of New York.²¹⁹ Then, in 1933, the Fed suspended repo in Bills, and by 1935 it stopped the practice in government securities entirely.²²⁰

Repos were revived by the FOMC in the post-War interregnum that preceded the Accord. Their use was justified primarily to manage liquidity in the financial system—as one of the more effective tools by which to target free reserves²²¹

https://fraser.stlouisfed.org/files/docs/historical/nara/bog_minutes/19250305_Minutes.pdf?utm_source=direct_download [https://perma.cc/98VQ-QLN2].

²¹⁸ The Board never formally endorsed Wyatt's original memo. Nor does it seem the memo was ever provided to the New York Fed directly. Letter from George L. Harrison, Deputy Governor of the Federal Reserve Bank of New York, to C. S. Hamlin (Feb. 11, 1925) (on file with the Columbia Business Law Review). Meanwhile the Fed Conference of Governors worked to find a way for dealer repo to persist “on substantially the same basis as at present, but in such form as may be decided proper under advice of counsel.” *Id.* The Board ultimately rejected Wyatt's position, voting on March 19, 1925 to “reaffirm previous decisions authorizing the practice, long continued, of purchase and sale in the open market of bankers acceptances and Government securities, by Federal reserve banks from banks and qualified dealers, under 15 day ‘repurchase agreements.’” Bd. of Governors of the Fed. Rsrv. Sys. Meeting Minutes, at 8 (Mar. 19, 1925), <https://fraser.stlouisfed.org/title/minutes-board-governors-federal-reserve-system-821/meeting-minutes-march-19-1925-27479> [https://perma.cc/8F62-NZZH].

²¹⁹ New York dominated this practice, as indicated in Musgrave, Richard, Memorandum from Richard Musgrave to Emanuel Goldweiser (Nov. 29, 1941), <https://fraser.stlouisfed.org/archival-collection/records-federal-reserve-system-1344/discount-rates-operations-fr-banks-repurchase-paper-1942-1958-540597> [https://perma.cc/6GEM-W35T].

²²⁰ Office Correspondence from Miss Goheen to Mr. Leonard, Director, Division of Bank Operations of the Federal Reserve System, and Mr. Myrick (June. 20, 1949), <https://fraser.stlouisfed.org/archival-collection/records-federal-reserve-system-1344/discount-rates-operations-fr-banks-repurchase-paper-1942-1958-540597> [https://perma.cc/T7U5-FALR].

²²¹ See, e.g., *Significance and Limitations of Free Reserves*, 40 FED. RSRV. BANK OF N.Y. ECON. POL'Y REV. 10–15 (1958). For a more extended discussion, see JAMES A. MEIGS, *FREE RESERVES AND THE MONEY SUPPLY* (1968).

and implement monetary policy.²²² But there were other important motivations as well, including support for the intermediation of government securities.²²³ For example, at an Executive Committee Meeting in December 1947, Allan Sproul noted that dealers would struggle to hold inventory when money market rates were above their carrying yield (negative carry),²²⁴ and that a reinstated repo authority could help stabilize this dynamic.²²⁵ He also alluded to tactical advantages of repos over other forms of Federal Reserve credit and short-term lending, potentially including §13(13) advances.²²⁶ Although Sproul did not mention it, to the extent

²²² See, for example, discussion at the July 12, 1955 Federal Open Market Committee Meeting. Fed Open Mkt. Comm. Meeting Minutes (Jul. 12, 1955), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19550712.pdf> [<https://perma.cc/Q6ZH-8QSU>].

²²³ GARBADE, *supra* note 180.

²²⁴ “Negative carry” refers to a situation in which the cost of borrowed funds used to carry fixed income securities that are higher than the coupon accrual earned by those asset. That results in negative returns (often referred to as “rent” or “bleed”) as time passes. In the case of a market maker, which typically operates with a relatively thin capital cushion, this could quickly erode the profitability of their enterprise, especially in assets like Treasury securities which are typically traded with very low transaction costs.

²²⁵ As noted in a late 1947 Executive Committee meeting: “there were times in the market when the rates at which dealers were able to borrow were higher than the rates on the securities held by them with the result that they were unwilling to carry the securities.” Fed. Open Mkt. Comm. Meeting Minutes 4 (Dec. 9, 1947), <https://www.federalreserve.gov/monetarypolicy/files/FOMChminec119471209.pdf> [<https://perma.cc/D39F-B4CV>].

²²⁶ *Id.* at 4 (“He added that there were also situations in which the dealers needed immediate funds and that when securities were sold they were not delivered and the proceeds of the sale were not available until the following day.”). A joint study from the Federal Reserve and Treasury Department later described the complexities of intraday cash management among government securities dealers using collateralized money market loans from commercial banks. JOINT ECON. COMM., 86TH CONG., A STUDY OF THE DEALER MARKET FOR FEDERAL GOVERNMENT SECURITIES 74–74 (Comm. Print 1960). These descriptions highlight the tactical advantage of repos in managing intraday funding needs (or excesses) related to volatile dealer inventories which were arguably impractical or potentially impossible using

these transactions could be regarded as a true sale, they were arguably consistent with the Fed's §14 authority to transact in securities markets without the need to identify "unusual and exigent circumstances" or comply with the credit availability proviso.

This generated a need to clarify the legal bases under which these transactions were performed, which was ambiguous and contested in the 1920s.²²⁷ Several internal legal memos blessed the practice as authorized²²⁸ by Section 14, and the Board voted explicitly to authorize repos to primary dealers (including nonbanks) by Reserve banks directly—though still at a penalty rate relative to all prevailing discounts offered to member banks, not for longer terms than fifteen days, and some other limits.²²⁹ Later, the

advances including explicit collateral agreements and the issuance of promissory notes.

²²⁷ In subsequent communications, the Board appeared to consider these transactions to be §13 borrowings by member banks, rather than §14 open market transactions directed by the FOMC. *See* Letter from W.P.G. Harding, Fed. Rsrv. Bank Governor, to Wold, Fed. Rsrv. Bank Governor (Jan. 26, 1918), <https://fraser.stlouisfed.org/archival-collection/records-federal-reserve-system-1344/repurchase-paper-1917-1922-540595> [<https://perma.cc/49UR-MUB2>] ("Sale and repurchase agreement suggested by Board was intended to avoid use of revenue stamps on short loans maturing within fifteen days."). This was reinforced in April 1918, after the relevant provision was repealed. William McAdoo, Sec'y of the Treasury, to EDW. T. Brown, Deputy Chairman of the Bd. (Apr. 6, 1918), <https://fraser.stlouisfed.org/archival-collection/records-federal-reserve-system-1344/repurchase-paper-1917-1922-540595> [<https://perma.cc/S2KL-RDEJ>].

²²⁸ Interestingly, at least in part as implied by the advances permitted by §13(13). *See* Letter from George Vest, General Counsel to the Bd. of Governors of the Fed. Rsrv., to Exec. Committee of the Fed. Open Mkt. Comm., Oct. 1, 1954, available at https://fraser.stlouisfed.org/archival-collection/records-federal-reserve-system-1344/discount-rates-operations-fr-banks-repurchase-paper-1942-1958-540597_

²²⁹ Fed. Open Mkt. Comm. Meeting Minutes 10 (Jan. 20, 1948), <https://www.federalreserve.gov/monetarypolicy/files/FOMChminec119480120.pdf> [<https://perma.cc/KV9E-BCZ8>].

pricing of these repos was relaxed to allow direct offerings to qualified nonbank dealers below the discount rate.²³⁰

That was not, however, the end of the matter. In 1954, Governor Robertson objected to the use of repos to fund nonbank dealer activity²³¹ on the basis of his views on its legality²³² as well as the market implications of offering advantageous funding to nonbank dealers.²³³ Facing pushback, Robertson took the unusual step of reading a lengthy statement detailing his objections at a subsequent meeting.²³⁴

George Vest, General Counsel to the Board of Governors at the time, took up the issue shortly thereafter in a memorandum to the Executive Committee distributed in October 1954.²³⁵ From a legal perspective, he argued, although repos resembled loans in certain respects, they were “justified” under Section 14 because their “primary purpose [was] implementing open market policies” rather than “providing credit accommodations to particular institutions.” This was strengthened, in his view, by what he termed the

²³⁰ Fed. Open Mkt. Comm. Meeting Minutes 17 (Aug. 5, 1949), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19490805.pdf> [<https://perma.cc/SUP2-WXC4>].

²³¹ GARBADE, *supra* note 180.

²³² Robertson thought that repos “constituted a loan” and therefore were “originally . . . an illegal arrangement.” His only hesitance to push the issue further was their “many years of legal support” and the fact that the matter had already been referred to the Legal Department for review. Fed. Open Mkt. Comm. Meeting Minutes 3 (Sept. 22, 1954), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19540922.pdf> [<https://perma.cc/FA85-LPV5>].

²³³ Robertson believed that “dealers in government securities should not be given an advantage which was not given to member banks” and that, if the Fed were to persist in offering financing via repos, they should at a minimum do so at a rate no lower than discounts. *Id.* at 4.

²³⁴ See Fed. Open Mkt. Comm. Meeting Minutes 11 (Sept. 22, 1954), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19540922.pdf> [<https://perma.cc/4BMX-GML9>]. See also GARBADE, *supra* note 180 for the full text.

²³⁵ Vest, *supra* note 231.

“weight of long administrative interpretation”²³⁶ in which repos had been used for many years with full knowledge of both Congress and the Board. He further argued that the Fed was within its authority to offer repos below the discount rate and exclusively to nonbank dealers.

Robertson persisted, bringing an alternative framework for “open window” lending to the FOMC in March of 1955. He was, however, the only member of the Committee in favor—armed with the support of the Legal Department, all the others voted against.²³⁷ The plan was soundly rejected in favor of the existing repo authority.

Likely as a result of the Fed’s new policy (that it would backstop nonbank dealers through repo lending) nonbank dealers began to fund themselves much of the time by entering into repo agreements with the corporate sector. Indeed, such repurchase agreements quickly became the primary means by which government securities dealers financed their activity. Comprehensive and reliable data are hard to come by, but research conducted at the time offers some context. For example, a joint Treasury-Federal Reserve study conducted in the late 1950s noted that, though the composition of their funding mix varied quite a bit, repo generally accounted for “55–70 per cent” of total dealer financing, and sometimes as high as 85%.²³⁸ Around the same time, a study produced by

²³⁶ *Id.* (“Whatever may have been the situation in the early 1920’s when the legal authority of the Reserve Banks to enter into repurchase agreements was under consideration, the legal status of such agreements as purchases under section 14 is now given strong support by long years of administrative interpretation.”). Vest highlighted the voluntary nature of the closing leg of the transaction, with the Fed holding the option but not the obligation to resell, which was noted in an early but ultimately rejected legal opinion from 1923. *Id.*

²³⁷ Only Robertson voted in in favor, though he had verbal support of Malcom Bryan, President of the Federal Reserve Bank of Atlanta but a non-voting member at the time. Fed. Open Mkt. Comm. Meeting Minutes 12 (July 12, 1955), <https://www.federalreserve.gov/monetarypolicy/files/FOMChistmin19550712.pdf> [<https://perma.cc/2QKW-D4YU>].

²³⁸ U.S. Dep’t of the Treasury & the Bd. of Governors of the Fed. Reserve Sys., *Part III: Supplementary Studies, in* TREASURY-FEDERAL RESERVE STUDY OF THE GOVERNMENT SECURITIES MARKET 70 (1960).

the New York Clearing House Association detailed the expansion of dealer repo and worried that “frequent use of the [Fed’s repo] facility, at relatively cheap rates, encourages dealers to borrow from the Federal Reserve whenever possible and tempts banks to wash their hands of responsibility for dealer financing requirements.”²³⁹ Another study by the Federal Reserve Bank of New York found that repo made up two-thirds of dealer funding in the early 1960s.²⁴⁰ If anything, these statistics understate the centrality of this new funding mechanism to the nonbank dealers which dominated activity (e.g., 80% of the total from 1961–’64).²⁴¹

The Fed’s involvement developing the legal structure for repurchase agreements as well as using them as a backstop for nonbank dealer firms gave corporate cash providers greater comfort with “depositing” their money in the form of repurchase agreements with nonbank dealer firms. Facilitating the growth of this non-deposit instrument, which could be held by the private sector, was one of the most important consequences of the Fed’s relying on repo to subsidize government securities dealers rather than on discounts or advances. Direct extensions of credit by the Fed—including §13(3) and §13(13) loans—were the exclusive purview of the central bank; there were no coattails to ride. The Fed’s repo operations, by contrast, seeded the growth of a new market for short-term borrowing and lending with an implicit Fed backstop. That allowed for much more supply elasticity and arguably avoided the political ramifications of a

²³⁹ N.Y. CLEARING HOUSE ASS’N, A STUDY OF THE INTERRELATIONS OF THE MONEY MARKET AND GOVERNMENT SECURITIES MARKET: REPORT TO THE FEDERAL RESERVE BANK OF NEW YORK 37 (1957).

²⁴⁰ Fed. Rsrv. Bank of N.Y., *The Financing of Government Securities Dealers*, 46 FED. RSRV. BANK OF N.Y. MONTHLY REV. 107, 107 (1964); see also Hyman P. Minsky, *Central Banking and Money Market Changes*, 71 Q. J. ECON. 171, 176–81 (1957).

²⁴¹ Taking 1961 as an example, “collateral loans and own bank funds” were 37% of all dealer financing, and banks were 19% of the same total. If we assume all bank dealers were financed by their affiliated depository institution, then repo would implicitly make up 76% of nonbank financing. Fed. Rsrv. Bank of N.Y., *supra* note 243.

large and ongoing Fed footprint in the dealer financing market.

A new money-like asset with implicit Fed support came at an opportune time. Corporate America in the 1950s was cash-rich²⁴² but had few attractive options for managing its liquidity. Bank deposits were both largely uninsured²⁴³ and yielding very unattractive rates compared to money markets (zero in many cases)²⁴⁴ due in large part to strict limits on competition among banks imposed by a government rule known as Regulation Q.²⁴⁵ Although corporations could, in principle, transact in money markets directly, access and capacity were an issue: in 1950, total T-Bills outstanding were

²⁴² As of the late 1950s, the Fed-Treasury Joint Report refers to dealers as relying on internal “money desks” to source funding from a variety of sources, including “repurchase agreements . . . with corporations throughout the country.” STAFF OF JOINT ECON. COMM., 86TH CONG., A STUDY OF THE DEALER MARKET FOR FEDERAL GOVERNMENT SECURITIES: MATERIALS PREPARED FOR THE JOINT ECONOMIC COMMITTEE 12 (Dec. 1960).

²⁴³ The FDIC increased their deposit insurance limit from \$5,000 to \$10,000 in 1950. FED. DEPOSIT INS. CORP., THE FIRST FIFTY YEARS: A HISTORY OF THE FDIC 1933–1983, at 55 (1984). However, that corresponds to only \$122,000 today (compared to the current limit of \$250,000). See FED. RSRV. BANK OF MINNEAPOLIS, CONSUMER PRICE INDEX, 1913, <https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1913-> [<https://perma.cc/BFU8-GHBL>].

²⁴⁴ Data collected by the “Hunt Report” suggests overall commercial bank deposit rates paid were roughly 1.15% in 1952 (the year following the Accord), see FED. RSRV. BANK OF N.Y., REPORT OF THE PRESIDENT’S COMMISSION ON FINANCIAL STRUCTURE AND REGULATION 146 (1972), compared to 3-month Bill yields around 1.7% and discount rates at 1.75%. Int’l Monetary Fund, *Interest Rates, Discount Rat for United States*, FED. RSRV. ECON. DATA (Oct. 4, 2021), <https://fred.stlouisfed.org/series/INTDSRUSM193N> [<https://perma.cc/SF99-N6FG>]. Though banks used “innovations in the techniques to acquire funds” in the more restrictive monetary policy environment of the late-1960s, the gap between deposit rates and Bill yields only widened, reaching 1.8% in 1969. COMM’N ON FIN. STRUCTURE AND REG., THE REPORT OF THE PRESIDENT’S COMMISSION ON FINANCIAL STRUCTURE AND REGULATION (1971).

²⁴⁵ R. Alton Gilbert, *Requiem for Regulation Q: What It Did and Why It Passed Away*, 68 FED. RSRV. BANK OF ST. LOUIS REV. 22, 28 (Feb. 1986).

a bit more than \$13 billion²⁴⁶ (of which \$4 billion were held by the Fed²⁴⁷) and commercial paper outstanding at the time was roughly \$1 billion,²⁴⁸ compared to \$24 billion of checkable deposits and currency held by nonfinancial corporate business.²⁴⁹

The new repo instrument issued by dealer firms was an attractive alternative to deposits and T-Bills²⁵⁰ due to its short maturity (typically overnight) and high level of security provided by Treasury collateral (depending on the terms, close to the economic equivalent to federal deposit insurance).²⁵¹ As the New York Clearinghouse Association—an organization of large banks—observed at the time: “In the whole gamut of liquid assets created by financial intermediaries, none approximates cash more closely than the repurchase agreement renewed day-to-day or running at the option of the

²⁴⁶ *Monthly Statement of the Public Debt*, U.S. DEPT. OF THE TREASURY (January 31, 1950) <https://www.treasurydirect.gov/govt/reports/pd/mspd/1950/opdm011950.pdf> [<https://perma.cc/99Q7-K5S9>].

²⁴⁷ Bd. of Governors of the Fed. Rsr. Sys., *Factors Affecting Reserve Balances of Depository Institutions and Condition Statement of Federal Reserve Banks 1* (1950), <https://fraser.stlouisfed.org/title/h41-factors-affecting-bank-reserves-condition-statement-fr-banks-83/january-12-1950-491802> [<https://perma.cc/3KX7-G997>].

²⁴⁸ Richard T. Selden, *Four Decades of Change in the Commercial Paper Market*, in *TRENDS AND CYCLES IN THE COMMERCIAL PAPER MARKET*, 12, 12 (Richard T. Selden ed., 1963).

²⁴⁹ Bd. of Governors of the Fed. Rsr. Sys., *Nonfinancial Corporate Business; Checkable Deposits and Currency; Asset, Level*, FED. RSRV. ECON. DATA (Dec. 9, 2022), <https://fred.stlouisfed.org/series/NCBDCAA027N> [<https://perma.cc/CYK6-G7YY>].

²⁵⁰ The Treasury-Federal Reserve Joint Study of 1958 notes that, “through their repurchase operations, dealers have, in effect, created a new form of financial asset that has been welcomed by many investors [including nonfinancial corporations] as an almost riskless interest-bearing outlet for short-term funds.” U.S. DEP’T OF THE TREASURY, *supra* note 241, at 71.

²⁵¹ Whereas with an insured bank deposit, the credit of the federal government stands behind the credit of the bank through the instrument of the Federal Deposit Insurance Fund, *see* 12 U.S.C. §§ 1815, 1821, in a repurchase agreement, the credit of the federal government stands behind the credit of the cash borrower through the instrument of a direct claim on the United States, *see* 31 U.S.C. § 3101.

buyer . . . In a nutshell, the dealer has recreated in the market the interest-bearing deposit supposed to have been exorcized by the Banking Act of 1933 [and Regulation Q].”²⁵²

Importantly, repo was also much more scalable—these transactions could be used to transform any of the more than \$150 billion in marketable Treasury debt outstanding in the mid-1950s,²⁵³ not to mention corporate and other financial assets,²⁵⁴ into a deposit substitute from the point of view of the lender. It should come as little surprise, therefore, that the vast majority of repo funding for government securities dealers in those early years came from non-financial corporations.²⁵⁵ Although the Fed was an infrequent creditor to dealers, it was particularly important during periods of monetary tightness and therefore served as a liquidity backstop for the repo market more generally, rather than a regular source of funding.²⁵⁶ As New York banks warned, this

²⁵² N.Y. CLEARING HOUSE ASS’N, A STUDY OF THE INTERRELATIONS OF THE MONEY MARKET AND GOVERNMENT SECURITIES MARKET: REPORT TO THE FEDERAL RESERVE BANK OF NEW YORK 34 (1957).

²⁵³ Fed. Rsrv. Bank of Dallas, *Market Value of Marketable Treasury Debt*, FED. RSRV. ECON. DATA (Feb. 15, 2023), <https://fred.stlouisfed.org/series/MVMTD027MNFBRBDAL> [<https://perma.cc/RH7J-QH8F>].

²⁵⁴ U.S. DEP’T OF THE TREASURY, *supra* note 241 (“The use of repurchase agreements has not been confined to Government securities but has included, much less frequently, corporate and municipal securities and even mortgages.”).

²⁵⁵ Roughly 90-95% of the total in the late 1950s. *Id.*; see also Fed. Rsrv. Bank of N.Y., *Monthly Review: October 1964*, 46 FED. RSRV. BANK OF N.Y. MONTHLY REV. 27 (1964).

²⁵⁶ The Treasury-Fed Joint Study, covering the late 1950s, notes that, “[f]rom time to time nonbank dealers may also obtain financing through repurchase agreements from the Federal Reserve Bank of New York.” That said, the authors also note that, “[i]n periods of credit restraint, this rate [direct repo with the Federal Reserve Bank of New York] has generally been lower than lending rates at the New York City banks, but in conditions of credit ease, it has generally been higher.” U.S. DEP’T OF THE TREASURY & THE BD. OF GOVERNORS OF THE FED. RESERVE SYS., *Part III: Supplementary Studies*, in TREASURY-FEDERAL RESERVE STUDY OF THE GOVERNMENT SECURITIES MARKET 70, 70 (1960), <https://fraser.stlouisfed.org/title/317/item/6280> [<https://perma.cc/6GVR-5X79>].

support risked “a nullification of the intent of the Banking Act of 1933 . . . to forbid banking activities outside the supervised banking system.”²⁵⁷

The banks’ warning was vindicated by events. In the 1970s, the pool of repo depositors at nonbank dealers expanded. The invention of the money market mutual fund²⁵⁸ (MMF) in 1972 (when the SEC approved the listing of the Reserve Fund²⁵⁹) was a watershed moment. These new vehicles provided individual and corporate savers with streamlined and simplified access to short-term wholesale interest rates through a closed-end mutual fund organized under the Investment Company Act of 1940.²⁶⁰ In addition to essentially eliminating the operational burden of managing these portfolios—non-trivial in an over-the-counter market with many diverse counterparties and daily rollover requirements—they also provided same-day liquidity guarantees, which imbued MMF shares with even more explicit deposit-like features. Starting at \$300 million in the Reserve Fund, their assets grew rapidly, reaching more than \$3.5 billion in 1975 and \$76 billion by the end of that decade.²⁶¹ This explosive growth created a need to source compliant investments,²⁶² which, broadly speaking, included

²⁵⁷ N.Y. CLEARING HOUSE ASS’N, A STUDY OF THE INTERRELATIONS OF THE MONEY MARKET AND GOVERNMENT SECURITIES MARKET: REPORT TO THE FEDERAL RESERVE BANK OF NEW YORK 17 (1957).

²⁵⁸ For a summary of some of the early debates, see Victoria Baklanova, Money Market Funds: An Introduction to the Literature (January 26, 2010) (Ph.D. dissertation, University of Westminster Law School), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1542983 [<https://perma.cc/R27H-VWAH>].

²⁵⁹ The Reserve Fund, originally known as the Reserve Primary Fund, was the first money market fund, introduced in February 1970 and opened to investors in October 1971. INV. CO. INST., REPORT OF THE MONEY MARKET WORKING GROUP (2009).

²⁶⁰ 15 U.S.C. §§ 80a-1–64.

²⁶¹ Bd. of Governors of the Fed. Rsrv. Sys., *Assets: Other Factors Supplying Reserve Balances: Total Factors Supplying Reserve Funds*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/WTFSRFA> [<https://perma.cc/FH3F-N8AC>] (last visited May 22, 2023).

²⁶² MMFs are governed by Rule 2(a)-7 of the ICA, which is reviewed in depth by JOAN O. SWIRSKY, STRADLY RONON STEVENS & YONG, LLP, THE

repos as well as other forms of short-term corporate and government debt. Nonbank dealers suddenly had a new and sticky source of money funding for their Treasury inventories.

D. Enshrining Bankruptcy Remoteness

A further bit of engineering in the 1980s added even greater depth and breadth to the Treasury market. Like deposits, repos are a form of money that is legally constructed. Part of the appeal of repo for lenders was precisely what had attracted the Fed in the first instance: the fact that legally, at least in certain respects, it might be considered a true sale²⁶³ rather than a secured loan. That meant, it was believed, that the lender would have immediate access to collateral for liquidation in the event the borrower failed to repurchase and sought bankruptcy protection.²⁶⁴ That consistent access to liquidity through the failure of a counterparty mimicked the receivership regime designed to safeguard depositors in the event of the equivalent failure of a monetary institution (i.e., commercial bank). This money-like security was, in the words of Peter Sternlight of the Federal Reserve Bank of New York,²⁶⁵ “an essential characteristic” without which repurchase agreements “would not serve the vital function

GUIDE TO RULE 2A-7: A MAP THROUGH THE MAZE FOR THE MONEY MARKET PROFESSIONAL (3d ed. 2006), https://www.stradley.com/~media/Files/Publications/2017/03/STRADLEY_Rule2a-7flyer_3rdEdition.pdf [<https://perma.cc/RQ8B-CXGH>].

²⁶³ In the 1960s, a survey of institutional investors in the government securities market conducted by the Federal Reserve Bank of New York noted that, “[m]ost, if not all, institutions (other than commercial banks) record repurchase agreements as a simultaneous purchase and sale.” JOSEPH SHERER, FED. RSRV. BANK OF N.Y., INSTITUTIONAL INVESTORS AND THE U.S. GOVERNMENT SECURITIES MARKET: STAFF STUDY 41 (1967).

²⁶⁴ David A. Skeel, Jr. & Thomas Jackson, *Transaction Consistency and the New Finance in Bankruptcy*, 112 COLUM. L. REV. 153, 159 (2012).

²⁶⁵ Peter Sternlight was Executive Vice President and Manager for Domestic Operations for the System Open Market Account in the early-1980s. Peter Sternlight, *Monetary Policy and the Open Market Operations in 1980*, FED. RSRV. BANK OF N.Y. Q. REV. (Summer 1981).

they now perform.”²⁶⁶ Bankruptcy remoteness was particularly critical for MMF cash providers, which had offered their shareholders daily liquidity for redemptions, requiring immediate access to their investments.²⁶⁷ But in the early years this was just an assumption among market participants. Whether bankruptcy courts would treat repos as true sales was untested in practice.²⁶⁸ In 1982, two cases provided such a test.

In early August, the Mount Pleasant Bank and Trust Company, a local institution in small-town Iowa with

²⁶⁶ *Hearing on Northern Pipeline Co. v. Marathon Pipeline Co. Decision; Consumer Credit Code Amendments; Agricultural Produce Bailment Amendments; Repurchase Agreement Code Amendments; Shopping Center Tenancy Amendments; and Timesharing Agreements Before the S. Comm. on Courts, H. Comm. on the Judiciary*, 99th Cong. 310 (1983) (statement of Peter Sternlight, Executive Vice President, Fed. Rsrv. Bank of N.Y.).

²⁶⁷ The year after the Lombard-Wall decision, the Investment Company Institute submitted a written statement to the Senate Subcommittee on Courts of the Judicial Committee noting that rulings applying the automatic stay to repo collateral “can only constrict the market and adversely impact those financial institutions which rely on repos to serve their specific needs” and that “a number of these institutions are subject to investment restrictions which may result in these institutions reevaluating their participation in the repo market if legislation [to exempt repos from the automatic stay] is not forthcoming.” *The Manville Bankruptcy And Amendments to the Bankruptcy Code Relating To The Northern Pipeline Decision*, 99 Cong. 514 (1983) (written statement of the Inv. Co. Inst.). A more recent but informative discussion can be found in Darrell Duffie & David A. Skeel, *A Dialogue on the Costs and Benefits of Automatic Stays for Derivatives and Repurchase Agreements* (Stanford University Working Paper No. 108, 2012), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1982095 [<https://perma.cc/J7VC-EJHE>].

²⁶⁸ In an amicus brief submitted to the court, the Federal Reserve Bank of New York argued that there was “no case law controlling this issue [application of the automatic stay to repurchase agreements] in the Southern District of New York.” They further argued that case law in other jurisdictions was inconclusive, leaving room for the court to decide the issue “in whatever way it feels appropriate.” Brief for the Fed. Rsrv. Bank of New York as Amici Curiae, *In re Lombard-Wall Inc.*, 23 B.R. 165 (Bankr. S.D.N.Y. 1982).

approximately \$25 million in assets,²⁶⁹ was closed by state regulators and placed into receivership with the FDIC, which cited the “poor quality of its assets.”²⁷⁰ Under most circumstances, Wall Street would have hardly noticed. However, in this case, although the bulk of the bank’s balance sheet was transferred to another local bank,²⁷¹ the FDIC retained a small portfolio of repos secured by government securities (along with some other liabilities).²⁷² Ultimately, the FDIC determined that, under Iowa state law, repo lenders did not hold a perfected security interest in the securities, rendering them general creditors of Mount Pleasant.²⁷³

Only a few days later, Lombard-Wall, a government securities dealer, filed for bankruptcy protection in the Southern District of New York,²⁷⁴ immediately freezing “hundreds of millions of dollars” in assets belonging to a wide range of financial institutions. “It is possible,” the Wall Street Journal reported at the time, that “those assets—cash and securities—may be tied up for months.” Lombard-Wall’s repo counterparties may have presumed this lockup did not apply to them, but a few weeks later the court ruled that those positions were secured loans and did not represent a perfected security interest in the underlying collateral.²⁷⁵ Accordingly, as with the Mount Pleasant case, repo cash providers would

²⁶⁹ Mount Pleasant’s assets included roughly 1,200 loans totaling just more than \$17 million, a video game parlor on Main Street (including Space Invaders!) and a farm. N.R. Kleinfeld, *When a Bank Died in Iowa*, N.Y. TIMES, Sept. 12, 1982. More importantly for repo markets, although de minimis to their overall estate, they had roughly \$350,000 of retail repurchase agreement assets. AM. BANKER, Sept. 14, 1982, at 1, col. 3.

²⁷⁰ *Iowa Bank Closed*, REUTERS, Aug. 7, 1982.

²⁷¹ *Takeover by Hawkeye of Failed Iowa Bank Arranged by FDIC*, WALL ST. J., Aug. 9, 1982.

²⁷² AM. BANKER, Sept. 14, 1982.

²⁷³ *Id.*; see also William F. Hagerty, IV, *Lifting the Cloud of Uncertainty Over the Repo Market: Characterization of Repos as Separate Purchases and Sales of Securities*, 37 VAND. L. REV. 401, 411 (1984).

²⁷⁴ *Two U.S. Securities Firms File Plea for Bankruptcy, Jarring Wall Street*, WALL ST. J., Aug. 13, 1982.

²⁷⁵ *Lombard Securities With Buy-Back Plan Are Frozen by Court*, WALL ST. J., Aug. 18, 1982, at 7.

be treated as creditors and therefore would need to seek the court's permission to liquidate the securities sold (i.e., the collateral). But unlike Mount Pleasant, which concerned Iowa state law, this bankruptcy proceeding was in federal court—specifically, the Southern District of New York, which has jurisdiction over most major government securities dealers. Efforts to argue to the contrary by both the Federal Reserve Bank of New York and the industry (both on an individual basis and via trade associations²⁷⁶) ultimately failed to sway the court, which reiterated its opinion in a subsequent ruling.²⁷⁷ Although the court ultimately allowed liquidations in a timely manner, its holding raised the risk that federal bankruptcy courts in New York, and potentially nationwide, would relegate repo lenders to ordinary creditors in the event of counterparty failure.²⁷⁸

The application of the automatic stay to repo positions meaningfully reduced the appeal of repos as an alternative to bank deposits. As creditors to the estate rather than owners of securities, repo cash providers would have to wait until the bankruptcy court authorized them to liquidate the assets (Treasuries or otherwise) securing their position. Not only would creditors lose access to some liquidity, but they would be exposed to fluctuations in the market value of their collateral²⁷⁹ for an indeterminant period.²⁸⁰ For money market funds and others looking for a money-like instrument,

²⁷⁶ Kenneth Garbade, *The Evolution of Repo Contracting Conventions in the 1980s*, 12 FED. RESV. BANK OF N.Y. ECON. POL'Y REV. 27 (2006).

²⁷⁷ *In re Lombard-Wall Inc.*, 23 B.R. 165 (Bankr. S.D.N.Y. 1982).

²⁷⁸ Hagerty, *supra* note 276, at 409–10.

²⁷⁹ Hagerty, *supra* note 276, at 410–11.

²⁸⁰ In the case of Mount Pleasant Bank and Trust, one observer noted that the liquidation of a small bank can take “18 months to two years.” N.R. Kleinfeld, *supra* note 272.

that was a serious problem.²⁸¹ Conditions in repo markets quickly deteriorated.²⁸²

The twin rulings kicked off an intense debate over the appropriate treatment of repo in bankruptcy,²⁸³ and a lobbying effort²⁸⁴ to find a legislative solution. Then-Chair of the Federal Reserve Paul Volker wrote to Senator Bob Dole, then Chairman of the Senate Judiciary Committee's subcommittee on courts, asking for a bill to avoid "major possibilities for disruption" in repo markets.²⁸⁵ Volker later argued in Congressional testimony that that the judicial developments risked "the inability of other parties promptly to liquidate their investments to obtain cash to meet obligations" which "could have a ripple effect throughout the securities market, causing an otherwise isolated financial

²⁸¹ For example, in his comments at the same hearing, Peter Sternlight observed "recently, the liquidity of the market for repurchase agreements has been threatened by the possible application of the automatic stay provision of the Bankruptcy Code." *Hearing on Northern Pipeline Co. v. Marathon Pipeline Co. Decision; Consumer Credit Code Amendments; Agricultural Produce Bailment Amendments; Repurchase Agreement Code Amendments; Shopping Center Tenancy Amendments; and Timesharing Agreements Before the S. Comm. on Courts, H. Comm. on the Judiciary*, 99th Cong. 310 (1983) (statement of Peter Sternlight, Executive Vice President, Fed. Reserve Bank of N.Y.). This is striking in part given his long tenure on the Open Market Trading Desk ("since the 1960s").

²⁸² Michael Quint, *Repo Backing is Under a Cloud*, N.Y. TIMES, Sept. 29, 1982. There is also empirical evidence for recent events running counter to prevailing wisdom among market participants at the time: the Investment Company Institute notes a sharp decline in repos held by MMFs from \$22.1 billion (9.7% of total assets) in August 1982 to \$16.2 billion (7.8%) in December of that year. For context, concerns that the automatic stay might apply to repos grew sharply in the wake of actions taken in the bankruptcy proceedings of Lombard-Wall. Michael Blumstein, *Lombard Creditors Seek Sale*, N.Y. TIMES, Aug. 17, 1982.

²⁸³ Michael D. Bolton, *Repurchase Agreement Transactions in Securities Investor Protection Act Proceedings*, 15 FORDHAM URB. L.J. 359 (1987).

²⁸⁴ Skeel & Jackson, *supra* note 267, at 159.

²⁸⁵ Tom Herman, *U.S. Government Securities Dealers Need Self-Review but No New Rule, Fed Says*, WALL ST. J., Oct. 13, 1982.

problem to spread to many other entities”²⁸⁶ and threatened both the “stability of the nation’s financial markets” and efficacy of repo as “a tool of monetary policy.”²⁸⁷ Subsequently, Congress passed the Bankruptcy Amendments and Federal Judgeship Act of 1984,²⁸⁸ which explicitly exempted repos from the automatic stay.²⁸⁹

The result was a further step toward moneyness: explicit protection in bankruptcy. Although economically equivalent to a secured loan, repos were henceforth treated as a true sale when the cash borrower defaulted. Initially limited to U.S. government obligations and other highly liquid securities,²⁹⁰ these carve-outs were eventually extended to mortgage and mortgage-related securities—including, fatefully, collateralized debt obligations constructed from mortgage-backed securities.²⁹¹ This new legal status likely assisted repo issuers in attracting bank depositors, propelling the market’s growth and allowing dealer capacity to keep pace with the increase in marketable Treasury debt as it continued to grow.²⁹²

²⁸⁶ Letter from Paul A. Volker to Hon. Robert J. Dole (Dec. 13, 1982), <https://fraser.stlouisfed.org/archival-collection/paul-a-volcker-papers-5297/congressional-correspondence-585147> [<https://perma.cc/FBA3-2CW7>].

²⁸⁷ *Id.*

²⁸⁸ Bankruptcy Amendments and Federal Judgeship Act of 1984, Pub. L. 98-353, 98 Stat. 333.

²⁸⁹ See, e.g., Steven L. Schwarcz & Ori Sharon, *The Bankruptcy-Law Safe Harbor for Derivatives: A Path-Dependence Analysis*, 71 WASH. & LEE L. REV. 1715, 1728 (2014).

²⁹⁰ Bankruptcy Amendments and Federal Judgeship Act of 1984, §§ 391–96.

²⁹¹ Edward R. Morrison, Mark J. Roe & Christopher S. Sontchi, *Rolling Back the Repo Safe Harbors*, 69 BUS. LAW. 1015 (2014).

²⁹² Garbade, *supra* note 279.

E. The Demand Side: Market Expansion

The size of the repo market increased from roughly \$2 billion in the early 1960s,²⁹³ to \$12 billion in the late 1970s,²⁹⁴ to more than \$300 billion in the mid-1980s.²⁹⁵ The Fed's liquidity backstop and efforts to ensure special treatment in bankruptcy were potentially instrumental in enhancing supply—i.e., the ability of the repo market to pull in new participants to meet increased demand from borrowers. At the same time, their provision of a liquidity backstop at lower cost than competing instruments (e.g., call loans) put a leaky but largely effective ceiling on rates that incentivized securities dealers to focus on repo as their primary source of funding. Although many factors can be cited, this preference was arguably an important accelerant that drove the disproportionately rapid and sustained growth of shadow banking in the U.S. relative to other advanced economies.

One explanation for this structural shift can be the trajectory of the public debt itself. The stock of direct obligations of the U.S. government held by the public declined rapidly after World War II, stabilizing in the early 1950s just as economic growth was accelerating. Although deficit spending resumed shortly thereafter,²⁹⁶ the growth of the Treasury market was significantly outpaced by the expansion of economic activity. For example, as a share of gross domestic product the stock of marketable debt outstanding declined consistently for three decades: from 104% in 1945 to 46% in

²⁹³ William F. Treibar, *The Federal Reserve System After Fifty Years*, 20 FED. RSRV. BANK OF N.Y. ECON. POL'Y 247 (1964).

²⁹⁴ Christopher J. McCurdy, *The Dealer Market for United States Government Securities*, FED. RSRV. BANK OF N.Y. Q. REV. (Winter 1977).

²⁹⁵ Bd. of Governors of the Fed. Rsrv. Sys., *U.S. Government Securities Dealers—Positions and Financing*, FED. RSRV. BULLETIN 112 (1987).

²⁹⁶ Based on data collected by the U.S. Office of Management and Budget and provided by the Federal Reserve Bank of St. Louis FRED service, between 1950 and 1970, the federal budget ran a surplus in five years and deficit the other fifteen. U.S. Off. of Mgmt. and Budget, *Federal Surplus or Deficit*, FED. RSRV. ECON. (Oct. 21, 2022), <https://fred.stlouisfed.org/series/FYFSD> [https://perma.cc/7YGF-D62V] (last visited May 23, 2023).

1950, to less than 30% in 1960, to roughly 15% by the mid-1970s.²⁹⁷

Despite these headwinds, turnover facilitated by government securities dealers increased substantially over the same period: more than doubling from less than 0.7% of free float (i.e., marketable debt outstanding excluding outright holdings by the Federal Reserve) in 1950 (just before the Accord) to 1.5% in 1965. This increase likely reflects, in part, the greater need for intermediation to stabilize markets and facilitate the transition to a private price-setting mechanism highlighted by the Ad Hoc Report. It was likely exacerbated by increased volatility in interest rate markets, which naturally raises the frequency and scale at which portfolios are rebalanced.²⁹⁸

At the same time, dealers took on a more prominent and important role in the primary market as well. Among the broader dealer community, a select few were authorized to participate in open market operations.²⁹⁹ That was, in principle, a valuable designation—it meant access not only to flows associated with monetary policy implementation, but also liquidity support from direct repo with the Federal

²⁹⁷ Fed. Rsrv. Bank of Dallas, *Market Value of Marketable Treasury Debt*, FED. RSRV. ECON. DATA (Feb. 15, 2023), <https://fred.stlouisfed.org/series/MVMTD027MNFBDAL> [<https://perma.cc/92EN-ABSF>]; U.S. Bureau of Econ. Analysis, *Debt Domestic Product*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/GDP> [<https://fred.stlouisfed.org/series/GDP>] (last visited May 23, 2023).

²⁹⁸ For example, the standard deviation of monthly changes in, e.g., Treasury Bill yields increased from less than 3 basis points in 1950 to 20 basis points only a few years later and nearly 40 basis points in the early 1960s (though with considerable variation about those levels). Bd. of Governors of the Fed. Rsrv. Sys., *Market Yield on U.S. Treasury Securities at 3-Month Constant Maturity, Quoted on an Investment Basis*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/DGS3MO> [<https://perma.cc/C5DE-Q6Z2>] (last visited May 23, 2023).

²⁹⁹ These were initially referred to as “qualified” dealers, and later “recognized” and ultimately “primary” dealers. For an overview of how this system originated, see KENNETH GARBADE, FED. RSRV. BANK OF N.Y., STAFF REPORTS NO. 1010, *THE EARLY YEARS OF THE PRIMARY DEALER SYSTEM* (2016).

Reserve. Being a primary dealer did, however, come with certain obligations. Not least among them was what came to be known as the auction participation standard. By analogy to corporate bond markets, primary dealers acted as underwriters at Treasury auctions.³⁰⁰ Although at first somewhat vague,³⁰¹ by the 1980s³⁰² the expectations of primary dealers were made more concrete. Among other requirements, primary dealers were asked to submit bids in proportion to their overall market share.³⁰³ This meant any paper that could not find a direct bidder at auction was left with the primary dealer community to distribute in secondary

³⁰⁰ For an extended discussion of the history of Treasury auction mechanics, see Kenneth Garbade, *The Institutionalization of Treasury Note and Bond Auctions, 1970–75*, 10 FED. RSRV. BANK OF N.Y. ECON. POL'Y REV. 29 (May 2004).

³⁰¹ For example, a 1963 study described the requirements to become a primary dealer as having “sufficient capital plus a demonstrated ability and willingness to make a primary market for Government securities on a national basis.” BD. OF GOVERNORS OF THE FED. RSRV. SYS. & THE U.S. TREASURY DEP'T, *THE FEDERAL RESERVE AND THE TREASURY: ANSWERS TO QUESTIONS FROM THE COMMISSION ON MONEY AND CREDIT* 238 (1963). Later, in 1967, another study noted, “The dealers generally felt that the nature of their business obligated them to help underwrite Treasury financings, and several dealers considered that the dealers as a group had performed very well in this respect.” NORMAN BERNARD, U.S. DEP'T OF THE TREASURY & BD. OF GOVERNORS OF THE FED. RSRV. SYS., *VIEWS OF THE U.S. GOVERNMENT SECURITIES DEALERS* 19 (1967).

³⁰² In a 1985 letter referring to recent Congressional testimony, E. Gerald Corrigan (President of the Federal Reserve Bank of New York) said: “We do not insist that a dealer take down a particular amount of securities from the Treasury, but we expect to see auction bids of a size commensurate with the dealers capacity and in a realistic price range relative to current market conditions” *Status of the GAO's Work Concerning the Government Securities Market: Hearing Before the Subcomm. on Domestic Monetary Pol'y of the H. Comm. on Banking, Fin. and Urb. Affs.*, 99th Cong. 35 (1986) (statement of E. Gerald Corrigan, President, Fed. Rsrv. Bank of N.Y.).

³⁰³ This was eventually revised to refer to “meaningful” participation in Treasury auctions. See, e.g., *Administration of Relationships with Primary Dealers*, FED. RSRV. BANK OF N.Y. (Jan. 22, 1992), https://www.newyorkfed.org/markets/pridealers_policies_920122.html [<https://perma.cc/35EL-8VK4>].

markets.³⁰⁴ Reflecting this obligation, beginning in the 1960s, primary dealers rapidly increased their share of allotments at the same time as the market grew—from less than 10% in the early 1960s to nearly 30% by the middle of the decade³⁰⁵ and more than half in the 1980s.³⁰⁶ Although they tended to trade out of a significant fraction of those allotments in the secondary market (presumably with clients lined up in advance), even in the early years of this arrangement, auctions tended to add significant new positions to inventory.³⁰⁷ To perform this function, dealers relied heavily on access to leverage which they increasingly sourced from the repo market. By the late 1970s, repo was nearly 90% of their funding on an aggregated basis.³⁰⁸

At the same time, the Treasury market went global. Only 1.8% of the free float was held internationally in 1950, but the years that followed saw a rapid and seismic shift of international reserve assets from GBP to USD,³⁰⁹ which more than quadrupled the foreign ownership share to 9.5% over

³⁰⁴ In 2010, the Federal Reserve formalized a pro rata bidding requirement for primary dealers to provide a backstop bid for Treasury auctions. *Administration of Relationships with Primary Dealers*, FED. RSRV. BANK OF N.Y. (Jan. 11, 2010), https://www.newyorkfed.org/markets/pridealers_policies_100111.html [<https://perma.cc/D5A6-6BPZ>].

³⁰⁵ JOINT TREASURY-FEDERAL RESERVE STUDY OF THE U.S. GOVERNMENT SECURITIES MARKET 70 (1973).

³⁰⁶ GENERAL ACCOUNTING OFFICE FOR THE SUBCOMM. ON DOMESTIC MONETARY POL'Y OF THE H. COMM. ON BANKING, FIN. AND URB. AFFS., 99th CONG., SURVEY OF THE FEDERAL RESERVE SYSTEM'S SUPERVISION OF THE TREASURY SECURITIES MARKET 11 (Comm. Print 1985) ("Presently numbering thirty-seven, primary dealers purchase a large portion (about 55 percent) of the Treasury securities sold at auction and make an active secondary market for U.S. Government and Federal agency securities.")

³⁰⁷ PAUL MEEK, FED. RSRV. BANK OF N.Y., *THE CHANGING STRUCTURE OF THE DEALER MARKET IN GOVERNMENT SECURITIES* 37 (1967).

³⁰⁸ McCurdy, *supra* note 297.

³⁰⁹ U.S. dollar assets grew from 33% of foreign reserve holdings in 1950 to 62% just ten years later and nearly 80% by 1975. Barry Eichengreen, Livia Chițu & Arnaud Mehl, *Stability or Upheaval? The Currency Composition of International Reserves in the Long Run*, 64 IMF ECON. REV. 354 (2016).

twenty years. Just as the dollar was solidifying its position as the global reserve currency, the collapse of Bretton Woods led to an explosion of these holdings amidst widespread intervention in now-floating currency markets.³¹⁰ In 1970, official holdings of gold and foreign exchange totaled 2% of global GDP; by 1980, that figure was nearly 5%.³¹¹ Although there was some diversification over this period, U.S. dollar-denominated assets remained the preferred choice, at times representing roughly 70–80% of reserves excluding gold.³¹² International ownership of Treasuries increased alongside these broader shifts, more than tripling as a share of the overall stock to just under 30% over the course of the 1970s. Even as this was occurring, participation limits on single bidders at auction applied to foreign central banks as well as private investors.³¹³ Although it is unclear if those limits were binding in practice, they could have made it difficult for some of the largest institutions to source sufficient size in the primary market. That meant relying on dealers in secondary markets to fill their quotas.

Increasing demands for intermediation in principle required dealers to take on significantly more leverage.

³¹⁰ For an in-depth analysis of trends in foreign exchange reserves through the 1970s, see H. Robert Heller & Malcolm Knight, *Reserve Currency Preferences of Central Banks*, PRINCETON U. ESSAYS IN INT'L FIN., Dec. 1978, at 1.

³¹¹ Foreign reserves started growing in the 1950s (3% annualized in units of Special Drawing Rights) and 1960s (3% annualized) before accelerating dramatically in the 1970s (21% annualized). INT'L MONETARY FUND, ANNUAL REPORT (1976); INT'L MONETARY FUND, ANNUAL REPORT 65 (1981). That represented a more than doubling of these holdings relative to global GDP. World Bank Grp., *GDP*, THE WORLD BANK, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD> [<https://perma.cc/EQ7Z-AK4Z>], after adjusting for currency effects. Org. for Econ. Coop. & Dev., *National Currency to US Dollar Exchange Rate: Average of Daily Rates for the International Monetary Fund*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/CCUSMA02IFA618N> [<https://perma.cc/5WAF-4ATV>] (last visited May 23, 2023).

³¹² Eichengreen, Chitu & Mehl, *supra* note 312.

³¹³ Kenneth Garbade & Jeffrey F. Ingber, *The Treasury Auction Process: Objectives, Structure, and Recent Adaptations*, FED. RSRV. BANK OF N.Y. RECENT ISSUES IN ECON. & FIN. 3, 5 (Feb. 2005).

Although the Fed facilitated a highly elastic supply of cheap funding, dealers still had to comply with capital and liquidity requirements set by the Securities and Exchange Commission. These requirements were generally not, however, much of an impediment to rapid growth. In contrast to banks and other monetary activities, which are regulated under a “safety and soundness”³¹⁴ framework,³¹⁵ securities dealing was regulated by the SEC under an investor protection framework. The SEC’s approach primarily solves for the protection of client funds,³¹⁶ which implicitly assumes that the failure and liquidation of even a large dealer will not be a systemic event for the market. In other words, securities regulators had a greater tolerance for risk-taking than bank regulators, who were charged with preventing bank failure and losses to the deposit insurance fund.

In fact, until the 1970s, the SEC did not set net capital requirements at all. They were largely outsourced to the securities exchanges. It took what became known as the “paperwork crisis”³¹⁷ to motivate the SEC to impose uniform net capital requirements on broker-dealers.³¹⁸ Even with these new requirements, dealer leverage continued to grow, with total assets increasing from 5.8x to nearly 30x in the

³¹⁴ For an overview and history of safety and soundness in a bank supervision context, see Lev Menand, *Too Big to Supervise: The Rise of Financial Conglomerates and the Decline of Discretionary Oversight in Banking*, 103 CORNELL L. REV. 1527, 1542–47 (2018).

³¹⁵ *Id.*

³¹⁶ See 40 Fed. Reg. 29795 (July 16, 1975); Temporary Exclusion of U.S. Treasury Securities and Deposits at Federal Reserve Banks from the Supplementary Leverage Ratio, 85 Fed. Reg. 20578 (Apr. 14, 2020) (to be codified at 12 C.F.R. pt. 217).

³¹⁷ For roughly contemporaneous overview, see SEC. & EXCH. COMM’N, STUDY OF UNSAFE AND UNSOUND PRACTICES OF BROKERS AND DEALERS: REPORT AND RECOMMENDATIONS OF THE SECURITIES AND EXCHANGE COMMISSION (1971); see also Nicholas Wolfson & Egon Guttman, *The Net Capital Rules for Brokers and Dealers*, 24 STAN. L. REV. 603 (1972).

³¹⁸ For an in-depth discussion, see Michael P. Jamroz, *The Net Capital Rule*, 47 BUS. LAW. 863–912 (1992).

twenty-five years starting in 1975.³¹⁹ This process accelerated in the mid-2000s, as this ratio reached a peak of 47x in the first quarter of 2008—a rapid build-up of additional leverage that has at times been blamed on changes to net capital rules finalized in 2004.³²⁰ Throughout this period, the ability of nonbank entities to run their activity with lower levels of capital allowed them to continue to dominate dealer activity in government securities.³²¹

Given elastic sources of supply and demand for repo, as well as a growing need for increased intermediation capacity more generally, turnover in the Treasury market dramatically outpaced the growth in public debt more broadly. By 1990, daily turnover in Treasuries was around 6% of the total debt stock, a roughly tenfold increase since the time of the Accord. Although turnover stalled around those levels for several years, the subsequent ramp up in dealer leverage and increasing financialization of the economy in the years immediately prior to the global financial crisis (GFC) roughly doubled turnover once again to around 13% of marketable debt in 2007. At the same time, dealers became important conduits for leverage to the broader market as so-called matched-book repo allowed the distribution of leverage to hedge funds and other participants. Even as early as the 1970s, the majority of repo funding was matched off against

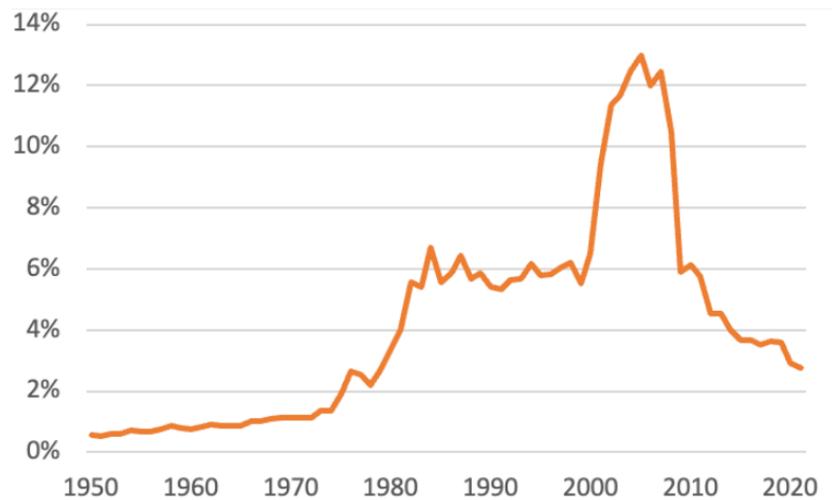
³¹⁹ Comparing total financial asset to liabilities for brokers and securities dealers. Bd. of Governors of the Fed. Rsr. Sys., *Security Brokers and Dealers; Total Financial Assets, Level*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/BOGZ1FL664090005Q> [<https://perma.cc/DLT4-R8D7>] (last visited May 23, 2023); Bd. of Governors of the Fed. Rsr. Sys., *Security Brokers and Dealers; Total Financial Assets, Level*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/BOGZ1FL664190005Q> [<https://perma.cc/BY3V-3B39>] (last visited May 23, 2023).

³²⁰ 12 C.F.R. pts. 200, 240. See Stephen Labaton, *U.S. Regulator's 2004 Rule Let Banks Pile Up New Debt*, N.Y. TIMES, Oct. 3, 2008.

³²¹ See CAGLIO, COPELAND & MARTIN, *supra* note 23. By contrast, in the UK, the legal framework limited the ability of firms to provide the leverage necessary to supply high levels of liquidity in government securities. See WILLIAM A. ALLEN, *THE BANK OF ENGLAND AND THE GOVERNMENT DEBT: OPERATIONS IN THE GILT-EDGED MARKET, 1928–1972* (2019).

reverse repo assets facing investors,³²² and that remained true in the period leading up to the GFC³²³ (and, in fact, to the present day).³²⁴ This broader access to leverage in principle allowed a host of speculative and other levered market participants to take on some of the most important economic functions when market conditions required them to do so—an additional source of support for market functioning (though, as we will see, one which proved highly brittle). If “breadth, depth, and resiliency” is measured by elastic intermediation capacity, then the policies put in place starting in the late 1940s bore tremendous fruit—or so it seemed.

*Table 5: Daily Average Trading Treasury Volume (as a Percentage of Total Marketable Debt)*³²⁵



³²² McCurdy, *supra* note 297, at 37–49.

³²³ CAGLIO, COPELAND & MARTIN, *supra* note 23.

³²⁴ *Primary Dealer Statistics*, FED. RSRV. BANK OF N.Y., <https://www.newyorkfed.org/markets/counterparties/primary-dealers-statistics> [<https://perma.cc/X2PX-HJCM>] (last visited May 23, 2023).

³²⁵ McCurdy, *supra* note 297; *US Treasury Securities Statistics*, SIFMA (Mar. 2, 2023), <https://www.sifma.org/resources/research/us-treasury-securities-statistics/> [<https://perma.cc/58N7-US7V>] (last visited May 23, 2023); Fed. Rsrv. Bank of Dallas, *Market Value of Marketable Treasury Debt*, FED. RSRV. ECON. DATA (Feb. 15, 2023), <https://fred.stlouisfed.org/series/MVMTD027MNFBDAL> [<https://perma.cc/6VEJ-MTQD>].

IV. THE DECLINE AND FALL OF THE PRIMARY DEALER SYSTEM

In 2008, the public financing system put in place during the 1950s—one that relied on select nonbank dealer firms financed by repos in private markets and backstopped by the central bank—unraveled. This Section traces the subsequent emergence of shadow dealers, at times more vulnerable to runs than nonbank dealers, and explains how they were a key driver of the 2020 financial panic and the recent fragility in Treasury markets.

A. The Introduction of Size Constraints

Among the many impacts of the GFC, one of the more important for market structure and government finance was the unwinding of a century of nonbank dominance in securities markets.³²⁶ Right after their leverage and footprint peaked in early 2008, one by one the largest stand-alone broker-dealers were either acquired by commercial banks (Bear Stearns by J.P. Morgan Chase,³²⁷ Merrill Lynch by Bank of America³²⁸), failed (Lehman Brothers),³²⁹ or opened banks and reorganized as bank holding companies (BHCs) (Goldman Sachs and Morgan Stanley).³³⁰ Intermediation

³²⁶ Commentators at the time described it as the “end of traditional investment banking.” Jon Hilsenrath, Damian Paletta & Aaron Lucchetti, *Goldman, Morgan Scrap Wall Street Model, Become Banks in Bid to Ride Out Crisis*, WALL ST. J. (Sept. 22, 2008), <https://www.wsj.com/articles/SB122202739111460721>.

³²⁷ NAT’L COMM’N ON THE CAUSES OF THE FIN. & ECON. CRISIS IN THE U.S., THE FINANCIAL CRISIS INQUIRY REPORT 280–291 (2011).

³²⁸ *Id.* at 324–43.

³²⁹ *Id.*

³³⁰ *Id.* at 353–88. Commentators at the time speculated this reorganization was driven by liquidity concerns, specifically access to Federal Reserve lending facilities. Andrew Ross Sorkin & Vikas Bajaj, *Shift for Goldman and Morgan Marks the End of an Era*, N.Y. TIMES (Sept. 21, 2008), <https://www.nytimes.com/2008/09/22/business/22bank.html> [<https://perma.cc/Y7UZ-GMEN>]. Others pointed to an easier path by which these companies could merge with existing depository institutions or make use of banking book accounting (specifically held-to-maturity assets which

capacity in Treasuries dropped suddenly, with gross traded volumes decreasing even as the market grew rapidly: turnover, measured as daily transactions among primary dealers relative to the free-float of the market averaged 11.6% in 2008 but only 6.5% the following year (a 44% decline), despite a more than \$1.5 trillion (33%) jump in marketable debt outstanding.³³¹

Why did intermediation capacity drop so sharply? Risk management amidst elevated levels of volatility across all financial markets (including interest rates) likely played an important role. So too did a more general retrenchment of repo-financed activities by broker-dealers—not to mention the effect of Bear and Lehman on aggregate intermediation capacity. But it also seems plausible that rapidly consolidating dealer activity within the bank regulatory perimeter had an impact as well. Though smaller dealers remained independent (e.g., Jeffries, Cantor Fitzgerald), for the first time in modern financial history the majority of dealer activity was performed within BHCs.³³² Accordingly, this large share of dealer activity was subject to bank regulations, including an earlier generation of internationally agreed requirements (known as Basel II) as implemented by

would not be marked to market). Jon Hilsenrath, Damian Paletta & Aaron Lucchetti, *Goldman, Morgan Scrap Wall Street Model, Become Banks in Bid to Ride out Crisis*, WALL. ST. J. (Sept. 22, 2008), <https://www.wsj.com/articles/SB122202739111460721> [<https://perma.cc/XH66-E2DF>].

³³¹ Fed. Rsrv. Bank of Dallas, *Market Value of Marketable Treasury Debt*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/MVMTD027MNFBDAL> [<https://perma.cc/TJ7Q-KZ23>] (last visited Feb. 15, 2023); Bd. of Governors of the Fed. Rsrv. Sys., *Assets: Securities Held Outright: U.S. Treasury Securities All: Wednesday Level*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/TREAST> [<https://perma.cc/K95K-6FQG>] (last visited Feb. 23, 2023); Ctr. for Fin. Stability, *Resources and Assets: U.S. Government Securities: Bought or Held Outright: Total Bought Outright*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/RAGSOTBO> [<https://perma.cc/PLS8-J6RF>] (last visited Feb. 10, 2021).

³³² CECILIA CAGLIO, ADAM COPELAND & ANTOINE MARTIN, FED. RSRV. BANK OF N.Y., *THE VALUE OF INTERNAL SOURCES OF FUNDING LIQUIDITY: U.S. BROKER-DEALERS AND THE FINANCIAL CRISIS 8* (2021).

the Federal Reserve.³³³ Although these requirements were still driven primarily by credit risk exposures (their so-called “binding constraint”³³⁴), the rules included synthetic risk-weighted assets to represent market risk generated by trading exposures.³³⁵ Detailed disclosure from that period is not available, but an examination of forms more recently produced³³⁶ by Goldman Sachs and Morgan Stanley, which remain predominantly dealers with minimal traditional commercial banking activity, suggests that interest rate exposures are often a significant driver of this market risk capital requirement.³³⁷

Market risk capital rules are conceptually similar to SEC net capital requirements, but empirical evidence suggests they can be more conservative—consistent with a safety and soundness approach, rather than an investor protection framework. This is evidenced by the abrupt drop in the ratio of total assets to Tier 1 capital for Goldman Sachs (from 24.5x in the third quarter of 2008 to 18.1x and 15.0x over the next

³³³ 12 C.F.R. pts. 208, 225.

³³⁴ In bank regulation, the binding constraint is the capital rule which generates the largest required amount of equity financing.

³³⁵ For the initial international standards, see BASEL COMM. ON BANKING SUPERVISION, AMENDMENT TO THE CAPITAL ACCORD TO INCORPORATE MARKET RISKS (1996).

³³⁶ For example, Pillar 3 disclosure of the components of regulatory capital and VaR from the first quarter of 2013 onwards. *See, e.g.*, THE GOLDMAN SACHS GROUP, INC., REGULATORY CAPITAL DISCLOSURES 6 (2013); MORGAN STANLEY, MARKET RISK CAPITAL DISCLOSURES REPORT 3 (2013).

³³⁷ *See* FED. FIN. INST. EXAMINATION COUNCIL, MARKET RISK REGULATORY REPORT FOR INSTITUTIONS SUBJECT TO THE MARKET RISK CAPITAL RULE—FFIEC 102 (2022). These data are all available quarterly since the first quarter of 2015 (with some reporting lag) and consolidated at the BHC level for The Goldman Sachs Group, Inc. (2380443) and Morgan Stanley (2162966). On the FFIEC 102, market risk RWA for advanced approach institutions is MRRR S347, regulatory VaR is S298, and the components of that VaR are attributed to positions in interest rates (S348), debt (S349), equities (S350), FX (S351) and other (S352); on the FFIEC 102 total RWA are A223. Earlier data is available from Basel Pillar III disclosure on their respective websites, starting with THE GOLDMAN SACHS GROUP INC., *supra* note 339 and MORGAN STANLEY, *supra* note 339, at 3.

two quarters³³⁸) and Morgan Stanley (from 26.3x in the third quarter of 2008 to 13.2x and 13.0x³³⁹) as they converted to BHCs. Their lower leverage ratios were more in line with other BHCs more focused on traditional banking activities.³⁴⁰

The events of 2008 marked only the first leg of the decline of the pre-crisis primary dealer system. The next came a few years later. In response to the GFC, the Basel Committee on Banking Supervision (BCBS; often referred to simply as “Basel”) formulated a third accord (Basel III) designed to address the perceived shortcomings of the prior international standards for banking supervision.³⁴¹ The updated capital rules, later implemented by U.S. regulators,³⁴² introduced new requirements tied to the overall size of depository institutions and BHCs. These “leverage ratios” compared assets to capital on a risk-agnostic basis—e.g., purely Federal Reserve liabilities (bank reserves), which are riskless, fungible payment instruments akin to paper currency, counted the same as high-risk unsecured corporate lending. U.S. regulators also included an enhancement (the supplementary leverage ratio, or SLR) which scoped in off-

³³⁸ Based on the ratio of Tier 1 capital to total assets. Goldman Sachs Grp., Inc., Quarterly Report (Form 10-Q) (Oct. 8, 2008); Goldman Sachs Grp. Inc., Quarterly Report (Form 10-Q) (Jan. 27, 2009); Goldman Sachs Grp., Inc., Quarterly Report (Form 10-Q) (May 6, 2009).

³³⁹ Based on the ratio of Tier 1 capital to total assets. Morgan Stanley, Quarterly Report (Form 10-Q) (Oct. 9, 2008); Morgan Stanley, Quarterly Report (Form 10-Q) (Jan. 29, 2009); Morgan Stanley, Quarterly Report (Form 10-Q) (May 7, 2009).

³⁴⁰ The economic leverage of Goldman Sachs and Morgan Stanley was, by early-2009, comparable to other large BHCs. As of the first quarter of 2009 J.P. Morgan, Bank of America, Citibank, and Wells Fargo has total asset to Tier 1 capital ratios of 15.1x, 14.5x, 14.9x, and 13.6x, respectively. JPMorgan Chase & Co., Quarterly Report (Form 10-Q) (May 7, 2009); Bank of Am., Quarterly Report (Form 10-Q) (May 7, 2009); Citigroup Inc., Quarterly Report (Form 10-Q) (May 11, 2009); Wells Fargo & Co., Quarterly Report (Form 10-Q) (May 11, 2009).

³⁴¹ For an overview, see BASEL COMM. ON BANKING SUPERVISION, BASEL III: A GLOBAL REGULATORY FRAMEWORK FOR MORE RESILIENT BANKS AND BANKING SYSTEMS (2011).

³⁴² 12 C.F.R. §§ 208, 217, 225.

balance sheet exposures (including repo).³⁴³ International standards set minimum leverage ratios at 3%, but the U.S. opted for an “enhanced” SLR (eSLR) for banks deemed Globally Systemically Important (G-SIB) by the Financial Stability Board,³⁴⁴ which had a higher minimum (5% for BHCs,³⁴⁵ 6% for depository institutions³⁴⁶).

The key here is the cost of capital. Although increasing the capital stock does not incur additional interest expense, issuing more equity reduces overall returns per share.³⁴⁷ Compared to the short-term wholesale and deposit³⁴⁸ funding

³⁴³ The numerator of the SLR is Tier 1 capital, as defined by the original Basel standards.

BASEL COMM. ON BANKING SUPERVISION, INTERNATIONAL CONVERGENCE OF CAPITAL MEASUREMENT AND CAPITAL STANDARDS (1988). The denominator includes all on-balance sheet assets as well as add-ons for derivative exposures, securities financing transactions (including repo), and off-balance sheet items (e.g., undrawn committed credit facilities, letters of credit, etc.). BASEL COMM. ON BANKING SUPERVISION, BASEL III LEVERAGE RATIO FRAMEWORK AND DISCLOSURE REQUIREMENTS (2014).

³⁴⁴ The definitive list of G-SIBs is published annually by the FSB. See e.g., Fin. Stability Bd., *2021 List of Global Systemically Important Banks*, FSB (Nov. 23, 2021), <https://www.fsb.org/2021/11/2021-list-of-global-systemically-important-banks-g-sibs/> [<https://perma.cc/87YS-N77Z>]. For a description of the assessment methodology, see Basel Comm. on Banking Supervision, *Global Systemically Important Banks: Assessment Methodology and the Additional Loss Absorbency Requirement*, FSB (Nov. 4, 2011), <https://www.bis.org/publ/bcbs207.htm> [<https://perma.cc/8UKP-UNNV>].

³⁴⁵ 12 C.F.R. pts. 208, 217

³⁴⁶ 12 C.F.R. pts. 6, 324.

³⁴⁷ The capital asset pricing model (“CAPM”) states that the cost of capital is linked to the returns shareholders expect to earn on their investment—for large banks and BHCs, recent estimates suggest roughly 10% is a decent guess for the average large institution. See ANNA KOVNER & PETER VAN TASSEL, FED. RSRV. BANK OF N.Y., *EVALUATING REGULATORY REFORM: BANKS’ COST OF CAPITAL AND LENDING* (2018).

³⁴⁸ Deposits typically price at a fraction of the Federal funds effective rate, *Effective Federal Funds Rate*, FED. RSRV. BANK OF N.Y., <https://www.newyorkfed.org/markets/reference-rates/effr> [<https://perma.cc/BXD6-82BR>], which is an index of overnight borrowing rates for trading in Federal Reserve liabilities that serves as the target for monetary policy in the U.S. See, e.g., Nathan Stovall, *Deposit Betas to Keep Rising at US Banks Even as Fed Slows Rate Hikes*, S&P GLOB. MKT. INTEL.

that make up the vast majority of bank liabilities, financing assets with equity is much less attractive in terms of all-in returns to shareholders. When certain actions require more capital, either because they are riskier or because they gross up the size of the institution, it increases the effective funding costs of that marginal activity.

Leverage ratios were designed as a backstop to risk-based capital requirements,³⁴⁹ and therefore not intended to be a primary consideration for bank activity under “normal” conditions.³⁵⁰ There is some debate as to whether leverage was a binding constraint in practice after the phase-in of SLR was complete.³⁵¹ Regardless, the presence of blunt, size-based requirements in the first instance meant that, for banks to make longer-run plans and allocate resources like capital and liquidity, they need to carefully control the size of their balance sheet on a multi-year basis. Given the complexity of a typical BHC with significant dealer operations, that likely meant regular, top-down budgeting of balance sheet allocations among business lines and, in some cases, certain activities.

(Mar. 19, 2019), <https://www.spglobal.com/marketintelligence/en/news-insights/trending/KXEljtZFIT2AT71XiUB3JA2> [<https://perma.cc/N96W-W2N3>].

³⁴⁹ For example, the final Basel standards state clearly that leverage ratios are intended to “reinforce the risk-based requirements with a simple, non-risk based ‘backstop’ measure.” BASEL COMM. ON BANKING SUPERVISION, BASEL III LEVERAGE RATIO FRAMEWORK AND DISCLOSURE REQUIREMENTS, *supra* note 348.

³⁵⁰ Also at June press conference, Powell noted: “when leverage requirements are . . . binding, it does skew incentives for firms to substitute lower-risk assets for high-risk ones. It’s a straightforward thing.” Jerome Powell, Chair, Fed. Rsrv. Bd., Chair Powell’s Press Conference 19 (June 16, 2011), <https://www.federalreserve.gov/mediacenter/files/FOMCpresconf20210616.pdf> [<https://perma.cc/37U6-BVYA>].

³⁵¹ DARRELL DUFFIE, FRAGMENTING MARKETS: POST-CRISIS BANK REGULATIONS AND FINANCIAL MARKET LIQUIDITY (2022); Robin Greenwood, Samuel G. Hanson, Jeremy C. Stein, & Adi Sunderam, *Strengthening and Streamlining Bank Capital Regulations*, BROOKINGS PAPERS ON ECON. ACTIVITY 479 (Sept. 2017).

When different types of financial businesses—securities dealing and banking, for example—are housed under one roof, the broad, uniform application of a leverage ratio can favor some of those businesses over others. Activity-based limits are particularly useful for securities dealing since, in contrast to somewhat slower-moving traditional banking activities like consumer and commercial lending, dealer utilization of balance sheet can be very dynamic and volatile over short timescales. But when those limits are based on size and not risk (credit or otherwise), the allocation process for some activities turns into a zero-sum game played by a wide range of market makers. When this kind of internal competition drives decision making, significant frictions can arise in the process of determining local allocations—particularly during periods of heightened volatility and uncertainty. Thus, even if, at the holding company level, leverage is not a binding constraint, it can be functionally binding for specific subunits of the organization. That risk is most acute in businesses that utilize more leverage per unit revenue, such as intermediating Treasuries and Treasury repo.³⁵²

The capital surcharge applied to G-SIBs was another means by which additional capital was required to support what would previously be considered riskless activities (at least from a credit perspective).³⁵³ This regulation was designed to ensure that the largest institutions³⁵⁴ were

³⁵² Bloomberg: Odd Lots, *Josh Younger On the Bond Market's Recent Volatility*, BLOOMBERG (Jul. 8, 2022), <https://www.bloomberg.com/news/audio/2022-07-08/josh-younger-on-the-bond-market-s-recent-volatility-podcast> [<https://perma.cc/Q798-EQ3P>].

³⁵³ Dealing in Treasury securities is, of course, exposed to other types of risk besides the creditworthiness of the assets. Market risk refers to changes in price attributable to changes in market interest rates, and liquidity risk reflects the potential for forced sales in the event inventories cannot be financed at a rate consistent with profitability.

³⁵⁴ The definitive list of G-SIBs is published annually by the Financial Stability Board. See, e.g., *2021 List of Global Systemically Important Banks*, FIN. STABILITY BD. (2021), <https://www.fsb.org/wp-content/uploads/P231121.pdf> [<https://perma.cc/839E-4TNN>]. For a description of the assessment methodology, see BASEL COMM. ON BANKING SUPERVISION, GLOBAL SYSTEMICALLY IMPORTANT BANKS: ASSESSMENT

holding additional loss absorbing capacity in proportion to their overall systemic importance.³⁵⁵ This was implemented by means of an additional buffer on top of minimum risk-based capital requirements tailored to each in-scope institution using quantitative scores along several dimensions. In the U.S. specifically, this was implemented using measures of size, interconnectedness, complexity, cross-jurisdictional activity, and reliance on short-term wholesale funding.³⁵⁶ Treasury and repo intermediation contribute to several of those categories. In that sense, increasing intermediation capacity in those products not only added risk-weighted assets (RWA) through synthetic assets designed to capture the market risk associated with those activities, but also the minimum capital ratio a G-SIB must maintain against that denominator.

B. The Emergence of Shadow Dealers

The true impact of leverage and G-SIB constraints on Treasury dealing is still the subject of considerable debate. But the proof is arguably in the pudding. Before the ink was dry on the phase-in of these rules, the market was primed to test their impact. In 2016, fiscal policy was also turning the corner. After a post-War record 9.8% of GDP in 2009, deficits narrowed consistently to 2.4% of GDP in 2015,³⁵⁷ but then the Trump administration embarked on a series of tax cuts and spending increases. Those policies grew federal outlays by

METHODOLOGY AND THE ADDITIONAL LOSS ABSORBENCY REQUIREMENT (2011), <https://www.bis.org/publ/bcbs207.htm> [<https://perma.cc/EZM3-5WVJ>].

³⁵⁵ BASEL COMM. ON BANKING SUPERVISION, THE G-SIB ASSESSMENT METHODOLOGY – SCORE CALCULATION 1 (2014), <https://www.bis.org/bcbs/publ/d296.pdf> [<https://perma.cc/DAN8-3AFC>].

³⁵⁶ BD. OF GOVERNORS OF THE FED. RSRV. SYS., CALIBRATING THE GSIB SURCHARGE (2015), <https://www.federalreserve.gov/aboutthefed/boardmeetings/gsib-methodology-paper-20150720.pdf> [<https://perma.cc/DAN8-3AFC>].

³⁵⁷ U.S. Off. of Mgmt. and Budget, *Federal Surplus of Deficit as Percent of Gross Domestic Product*, FED. RSRV. ECON. DATA, <https://fred.stlouisfed.org/series/FYFSGDA188S> [<https://perma.cc/SG7S-T7VS>] (last visited May 23, 2023).

more than 20% between fiscal years 2016 and 2019, while revenues grew less than 7%,³⁵⁸ pushing the deficit to 4.6% of GDP—unusual for both its size and the direction of travel for a peacetime economic expansion. Meanwhile, the Fed allowed its Treasury holdings to run off, which effectively returned these securities to private hands—quantitative tightening³⁵⁹ (QT) to unwind several rounds of quantitative easing³⁶⁰ (QE) undertaken in the wake of the GFC. Reflecting this, the privately-owned segment of marketable Treasury debt grew more than \$2.7 trillion (20%) from 2017 to 2019.

So, at the same time as the supply of Treasury securities increased, banking regulations constrained demand from U.S. GSIBs and their government securities dealing desks. The headwinds facing bank-affiliated dealers considering expanded intermediation capacity in Treasury markets are evidenced by two measures. First, turnover in the free-float of Treasury securities in private hands declined steadily from 6.5% in 2009 to 4.1% in 2019, or 37% in trading volume adjusted for the size of the market; the effect was somewhat more pronounced among longer maturities, which saw the same measure drop from 7.4% to 3.9% over the same period (a 47% drop). Second, the quantum of Treasuries financed by primary dealers in comparison to the market as a whole stalled compared to the stock of debt, as Darrell Duffie and others have noted.³⁶¹

With bank-affiliated dealers struggling to keep pace with the broader growth of the market, who picked up the slack? Contenders had to be able to fill two key roles. First, they had to provide trade-matching services: lining up buyers and

³⁵⁸ *Budget and Economic Data: Historical Budget Data*, CONG. BUDGET OFF, <https://www.cbo.gov/data/budget-economic-data> [<https://perma.cc/TE2M-QKQF>] (last visited May 23, 2023).

³⁵⁹ Kristie M. Engemann, *What is Quantitative Tightening*, FED. RSRV. BANK OF ST. LOUIS OPEN VAULT BLOG (July 17, 2019), <https://www.stlouisfed.org/open-vault/2019/july/what-is-quantitative-tightening> [<https://perma.cc/45XZ-5AU3>].

³⁶⁰ Ben Bernanke, *The New Tools of Monetary Policy*, 110 AM. ECON. REV. 943 (2020).

³⁶¹ Duffie, *supra* note 25, at Fig. 2.

sellers in a particular security. To do this, dealers leverage their broad and diverse networks of institutional clients. Second, they had to provide inventory services: holding unsold securities on their balance sheet temporarily until a match could be made, to mitigate potential price impact from timing mismatches between buyers and sellers. To do this, dealers leverage their preferred status in the financial system, tapping cheap and elastic sources of (mostly repo) funding to finance these inventories, earning carry and policing relative value relationships.³⁶² Although the circumstances of the early 1950s were different in many important respects, the solution was, in a sense, similar: nonbanks were once again called upon to provide intermediation capacity.

The first function, trade matching, increasingly fell to principal trading firms (PTFs) and other high-frequency traders (HFTs). These enterprises are generally algorithmic, automated, and operate at high speed. They are designed to maximize order flow while minimizing inventory in order to focus entirely on monetizing transaction costs and, if and when they manifest, to profit from short-lived dislocations and pricing differences between very similar securities. HFT strategies originated in equity markets, but in recent years have taken over a significant fraction of secondary market activity in Treasuries as well—particularly on electronic

³⁶² “Relative value” refers to the difference in price between otherwise very similar financial instruments. Relative value trading strategies consider a range of these relationships, including futures versus the bonds in their deliverable basket, and previously issued Treasury securities relative to nearby maturities and the current (most recently sold) issue. These pricing relationships fall within a relatively narrow band under normal conditions but can occasionally become dislocated by large transactions, one-way markets, and other more technical, idiosyncratic, and temporary market dynamics. “Policing” these relationships refers to positioning for some reversion to the norm when that occurs and typically involves utilizing large amounts of leverage as deviations in relative pricing tend to be quite small in absolute terms (fractions of a percentage point). Dealers are well-positioned to do so, owing to their access to funding via repo, high level of sophistication, and informational advantage.

broker platforms.³⁶³ Their activity is highly concentrated among a very small set of individual firms.³⁶⁴

Inventory management, on the other hand, migrated to hedge funds and other levered participants. A subset of these investors specializes in the relative value strategies described above. Under the old regime, dealers dominated this function. But the introduction of size constraints via the SLR disincentivized doing so. That, of course, did not mitigate the market's need for intermediation (direct in the case of dealers, indirect in the form of hedge funds at PTFs) as the total stock of public debt continued to grow. Whether or not it was recognized at the time, hedge funds were incentivized to provide those services where dealers could not in two distinct but important ways.

First, price signals took the form of an improved carry profile. This was most apparent in the increase in Treasury yield relative to derivatives, where "spreads" (the difference in yield between very similar instruments) inverted around the middle of 2015.³⁶⁵ All else equal, that dynamic made building and maintaining levered long positions (owning Treasuries financed with repo) a more attractive trade for hedge funds and other levered market participants. That, in turn, provided an outlet for Treasury securities that would otherwise have been relatively expensive for dealers to hold in inventory, and thus likely reduced the price impact of marginal sales during periods of imbalanced flows.

³⁶³ James Collin Harkrader & Michael Puglia, Bd. of Governors of the Fed. Rsrv. Sys., *Principal Trading Firm Activity in Treasury Cash Markets*, FEDS NOTES (Aug. 04, 2020), <https://www.federalreserve.gov/econres/notes/feds-notes/principal-trading-firm-activity-in-treasury-cash-markets-20200804.html> [https://perma.cc/ZV5K-4DZZ].

³⁶⁴ Robert M. Smith, *Client List Reveals HFT Dominance on BrokerTec*, RISK.NET (September 23, 2015), <https://www.risk.net/derivatives/interest-rate-derivatives/2426923/client-list-reveals-hft-dominance-on-brokertec> [https://perma.cc/9HGY-6FQG].

³⁶⁵ Nina Boyarchenko, Pooja Gupta, Nick Steele & Jacqueline Yen, *Negative Swap Spreads*, FED. RSRV. BANK OF N.Y. ECON. POL'Y REV. 10 (Oct. 2018).

Second, to the extent that SLR and other regulations drove their internal economic incentives when managing balance sheet capacity, bank-affiliated intermediaries often allocated it on a “use it or lose it” basis. In other words, leverage budgets that were allocated to specific entities but, if they were left underutilized, were downsized in favor of more active clients during regular reviews. That motivated hedge funds and other major consumers of leverage to find ways to utilize leverage allocations without taking much market risk. In other words, it became costly not to use one’s access to bank balance sheet, for fear that access would not be available when needed. Cash/Treasuries basis trades, which are most commonly constructed as a “short” in futures and a repo-financed “long” in one or several bonds from that contract’s deliverable basket, rely on leverage but have a theoretically bounded payoff with minimal market risk in a relatively wide range of market conditions.³⁶⁶ That made them fit for purpose as a placeholder position to secure future access to balance sheet as needed.

Hedge funds thus accumulated large inventories of off-the-run Treasury securities (i.e., not the more recently issued)

³⁶⁶ Cash/futures basis trades generally consist of a long position, levered using repo, in a specific Treasury issue or group of Treasury issue paired with a short position in a futures contract into which those securities are deliverable. Although in the past, these transactions had complex options-like characteristics that hedge funds and other sought to monetize, more recently they have become low-risk exposures. Downside is limited by the fact that the securities can be delivered into the futures contract at a predetermined price relative to their purchase price, and upside is limited by arbitrage relationships in the absence of significant embedded optionality. GALEN BURGHARDT & TERRY BELTON, *THE TREASURY BOND BASIS: AN IN-DEPTH ANALYSIS FOR HEDGERS, SPECULATORS, AND ARBITRAGEURS* (2005). Limited downside in particular made cash/futures basis positions, specifically those in the cheapest-to-deliver Treasury issue for a given futures contract, a popular ‘placeholder’ position for hedge funds looking to maintain continuous access to dealer balance sheet and repo leverage without taking significant market risk. Bloomberg: Odd Lots, *How the Crisis Nearly Blew Up One of the World’s Safest Trades*, BLOOMBERG (Mar. 26, 2020) <https://www.bloomberg.com/news/articles/2020-03-26/how-the-crisis-nearly-blew-up-one-of-the-world-s-safest-trades#xj4y7vzkg> [<https://perma.cc/HGT9-GRJG>].

hedged with short positions in derivatives—exposures which resembled, at least optically, inventories managed by dealers. This is clear from SEC Private Funds Statistics, which show a rapid increase in gross exposure to Treasuries among the hedge funds in their sample, which had remained around \$1 trillion from early 2014 (the earliest data available) until the fourth quarter of 2018,³⁶⁷ nearly doubling to \$2.2 trillion by the end of 2019.³⁶⁸ More detailed analysis using confidential data suggests their increased activity was generally associated with higher levels of concentration and leverage, and was associated with a rather dramatic increase in arbitrage-style positions that were driven in large part by a cash/futures basis position described above.³⁶⁹

C. The Collapse of Shadow Dealers

Together, this all amounted to a form of outsourcing—trade matching to PTFs, inventory management to hedge funds. The result was a veneer of stability, but it was not to last. Tremors started as early as 2014 with the “flash rally,” in which Treasury yields dropped precipitously in the span of

³⁶⁷ DIV. OF INV. MGMT’S RISK & EXAMINATIONS OFF. OF THE U.S. SEC. & EXCH. COMM’N, PRIVATE FUNDS STATISTICS: FOURTH CALENDAR QUARTER 2014 (2015), <https://www.sec.gov/divisions/investment/private-funds-statistics/private-funds-statistics-2014-q4.pdf> [https://perma.cc/9HX8-R6B3]; DIV. OF INV. MGMT’S ANALYTICS OFFICE OF THE U.S. SEC. & EXCH. COMM’N, PRIVATE FUNDS STATISTICS: FOURTH CALENDAR QUARTER 2017 (2018), <https://www.sec.gov/divisions/investment/private-funds-statistics/private-funds-statistics-2017-q4.pdf> [https://perma.cc/4E7B-GJX4].

³⁶⁸ DIV. OF INV. MGMT’S ANALYTICS OFFICE OF THE U.S. SEC. & EXCH. COMM’N, PRIVATE FUNDS STATISTICS: FOURTH CALENDAR QUARTER 2019 (2020), <https://www.sec.gov/divisions/investment/private-funds-statistics/private-funds-statistics-2019-q4.pdf> [https://perma.cc/LT5C-CMY9].

³⁶⁹ Ayelen Banegas, Phillip J. Monin & Lubomir Petrasek, *Sizing Hedge Funds’ Treasury Market Activities and Holding*, BD. OF GOVERNORS OF THE FED. RSRV. SYS. (Oct. 6, 2021), <https://www.federalreserve.gov/econres/notes/feds-notes/sizing-hedge-funds-treasury-market-activities-and-holdings-20211006.html> [https://perma.cc/4HGV-ZJKH].

less than an hour only to recover just as quickly.³⁷⁰ A year later, Treasury securities started pricing at a discount (higher yield) relative to derivatives tied to Libor (an unsecured bank credit index), an inversion of financial logic that was only explicable by invoking some version of the leverage-related balance sheet costs itemized above.³⁷¹ Although regulators and market participants continued to analyze the changes in structure that generated those and other smaller shocks, by the end of 2019, the scale of vulnerabilities embedded in the newly restructured Treasury market was still not apparent.³⁷²

As the economic consequences of global lockdowns came into focus in early-2020, financial markets entered a panic. The stock market gyrated wildly—volatility (as measured by the VIX index³⁷³) flirted with its prior peak in 2008³⁷⁴ and major indices posted one of their worst performances since the

³⁷⁰ U.S. DEP'T OF THE TREASURY, BD. OF GOVERNORS OF THE FED. RSRV. SYS., FED. RSRV. BANK OF N.Y., U.S. SEC. AND EXCH. COMM'N & U.S. COMMODITY FUTURES TRADING COMM'N, JOINT STAFF REPORT: THE U.S. TREASURY MARKET ON OCTOBER 15, 2014 (2015).

³⁷¹ For an extended discussion, see Boyarchenko et al., *supra* note 368.

³⁷² See, e.g., William C. Dudley, President and Chief Executive Officer, Fed. Rsrv. Bank of N.Y., Remarks at the Evolving Structure of the U.S. Treasury Market: Third Annual Conference (Nov. 28, 2017), <https://www.newyorkfed.org/newsevents/speeches/2017/dud171128> [<https://perma.cc/N5JW-RUBC>]; Governor Lael Brainard, *The Structure of the Treasury Market: What Are We Learning?*, BD. OF GOVERNORS OF THE FED. RSRV. SYS. (Dec. 3, 2018), <https://www.federalreserve.gov/newsevents/speech/brainard20181203a.htm> [<https://perma.cc/6D9B-BX2B>].

³⁷³ Cboe VIX FAQ, CBOE (2022) https://www.cboe.com/tradable_products/vix/faqs/?&&gclid=Cj0KCQjwla-hBhD7ARIsAM9tQKvNYCovKOQeCmRjnQMrCdT6XIX1sV7ZVwCcGdHuCQ_yxxkPkr3kNtgaAq0kEALw_wcB&gclsrc=aw.ds

³⁷⁴ Chi. Bd. Options Exch, *CBOE Volatility Index: VIX*, FED. RSRV. ECON. DATA (May 3, 2023), <https://fred.stlouisfed.org/series/VIXCLS> [<https://perma.cc/J582-725Q>]. It is also worth noting that a similar index based on three-month options exceeded its 2008 peak. Chi. Bd. Options Exch, *CBOE S&P 500 3-Month Volatility Index*, FED. RSRV. ECON. DATA (May 3, 2023), <https://fred.stlouisfed.org/series/VXVCLS> [<https://perma.cc/B4RN-HF5X>].

Great Depression.³⁷⁵ Treasury market yields dropped dramatically, with yields on ten-year maturities hitting a new all-time low of not much more than 0.5%;³⁷⁶ by some measures, it was the most dramatic re-pricing of interest rate expectations in many decades.³⁷⁷

PTFs and other HFTs can struggle to cope with extreme levels of volatility. Their strategies profit off of small and temporary dislocations between similar securities, both of which require some degree of stability and mean reversion in the second-by-second and minute-by-minute levels of absolute and relative prices. When volatility spikes, their reaction can be to simply pull the plug (i.e., cease making markets), which can be disruptive when buyers and sellers rely on them to provide a material share of the market's underlying liquidity.³⁷⁸ And pull the plug they did—empirical work suggests that, by early March 2020, HFTs had only a fraction of their former footprint in the market.³⁷⁹

That, in turn, pushed Treasury traders into futures markets, which tend to be more resilient to such shocks.³⁸⁰

³⁷⁵ Matt Egan, *The Dow is on its Longest Weekly Losing Streak Since 1923*, CNN BUS. (March 20, 2020), <https://www.cnn.com/2022/05/20/investing/dow-stock-market-losing-streak/index.html> [<https://perma.cc/6BX9-YU8H>].

³⁷⁶ Bd. of Governors of the Fed. Rsrv. Sys., *Market Yield on U.S. Treasury Securities at 10-Year Constant Maturity, Quoted on an Investment Basis*, FED. RSRV. ECON. DATA (Mar. 3, 2023), <https://fred.stlouisfed.org/series/DGS10> [<https://perma.cc/DWV5-6NDL>].

³⁷⁷ Joshua Younger, *Revisiting the Ides of March, Part I: A Thousand Year Flood*, COUNCIL ON FOREIGN REL.: FOLLOW THE MONEY BLOG (July 20, 2020), <https://www.cfr.org/blog/revisiting-ides-march-part-i-thousand-year-flood> [<https://perma.cc/MEU2-58HZ>].

³⁷⁸ Munier Salem, Joshua Younger, & Henry St. John, *Fast and Furious: the Link Between Rapid Trading and U.S. Rates Markets*, J.P. MORGAN U.S. FIXED INCOME STRATEGY (Nov. 20, 2018).

³⁷⁹ Younger, *supra* note 380, at chart 3.

³⁸⁰ Treasury futures are derivatives and therefore have embedded leverage, which means they do not require access to cash financing. That significantly reduces the operational complexity of active trading relative to traditional securities. They are also more standardized, with only a handful of contracts in contrast to dozens of commonly traded Treasury securities. As a result, the futures market has a much broader range of direct

But a knock-on consequence of that shift was a widening gap in pricing between those futures contracts and the bonds that were eligible for delivery. In the terminology of the traders themselves, the cash/futures basis began to dislocate.³⁸¹ That put increasingly acute pressure on hedge fund positions, which were in general thinly margined (particularly on the cash leg).³⁸² It was exacerbated by a dramatic increase in initial margin requirements on the futures leg of those trades—in some cases, tripling in only a few days—which amounted to a forced de-levering of that market.³⁸³ In the

participants with dealers more frequently acting as agent (i.e., connecting non-dealer buyers and sellers) than principle (warehousing unsold positions)—in other words, it is closer to an “all-to-all” market where end-users face each other directly, rather than through intermediaries. All else equal, that makes futures market liquidity more resilient under shocks and less exposed to the technical constraints that dealers contend with in trading traditional securities.

³⁸¹ Treasury futures contracts operate similarly to commodities futures. They represent a commitment to purchase securities on a future date and define a “deliverable basket” (the analogue of “deliverable grade” in commodities) which specifies precisely which issue or issues are acceptable. This is typically done to focus on a specific range of maturities so that investors and hedges can specify the level of interest rate risk they would like to take on. Because an arbitrager can in principle buy the bonds, sell the futures contract, and hold that position until they are permitted to make delivery, the price of a futures contract is conceptually and in practice almost always very tightly linked to the price of the most likely bonds to be delivered. In practice that requires access to leverage and can be distorted by temporary market dynamics, as was the case in 2020. For an overview of Treasury futures mechanics, see GALEN BURGHARDT & TERRY BELTON, *THE TREASURY BOND BASIS: AN IN-DEPTH ANALYSIS FOR HEDGERS, SPECULATORS, AND ARBITRAGEURS* (2005).

³⁸² In bilateral repo markets, margins are commonly termed “haircuts”—the fraction of cash required to buy a security that is not provided by the lender. For bilateral transactions, it was and remains commonplace for there to be no haircut at all associated with Treasury repo-based borrowing, which in principle means an infinite amount of leverage on the position. See e.g., VIKTORIA BAKLANOVA, CECILIA CAGLIO, MARCO CIPRIANI & ADAM COPELAND, FED. RSRV. BANK OF N.Y., *STAFF REPORTS NO. 758, THE USE OF COLLATERAL IN BILATERAL REPURCHASE AND SECURITIES LENDING AGREEMENTS* (2016).

³⁸³ Disclosure from the Chicago Mercantile Exchange and Board of Trade, which lists most major interest rate futures contracts in the U.S.,

meantime, rumors were circulating that the market might be closed at any time and for an indeterminate period, which increased the sense of urgency in managing exposures. The result was a disorderly delevering of relative value hedge funds: for example, data collected by the U.S. Treasury show that sales out of the Cayman Islands, where many hedge funds are domiciled, spiked dramatically in March and April.³⁸⁴ The pressure on the shadow dealer system was soon so extreme that traders and other market participants feared its complete collapse was imminent.

These issues were hardly confined to hedge funds. A host of other economic actors were stockpiling liquidity: corporate bond mutual and exchange-traded funds facing accelerating outflows, foreign central banks selling Treasuries to raise U.S. dollars for currency interventions, a global grab for dollars from the private sector, corporations tapping revolver facilities, and many others.³⁸⁵ When markets attempt to raise liquidity by monetizing financial assets, somebody has to do the maturity transformation; very often, that job falls to a commercial bank, which in turn means more leverage in the banking system as a whole. Thus, a toxic cycle began, of market panic spurring demands for liquidity, which further impede the ability of bank-affiliated dealers to intermediate effectively, increasing risk aversion and driving transaction

suggests that participants in that market had to come up with more than \$10 billion of new cash on a single day and \$80 billion by the end of March 2020.

Joshua Younger, *Cross-Margining and Financial Stability*, YALE FIN. STABILITY BLOG (June 22, 2021), <https://som.yale.edu/blog/cross-margining-and-financial-stability> [<https://perma.cc/G5TV-VU8Y>].

³⁸⁴ Joshua Younger, *Revisiting the Ides of March, Part II: The Going Gets Weird*, COUNCIL ON FOREIGN REL.: FOLLOW THE MONEY BLOG chart 3 (July 22, 2020),

<https://www.cfr.org/blog/revisiting-ides-march-part-ii-going-gets-weird> [<https://perma.cc/3T2E-UF2H>].

³⁸⁵ For a complete overview, see FIN. STABILITY BD., *HOLISTIC REVIEW OF THE MARCH TURMOIL* (2020).

costs to levels never previously seen in the Treasury market.³⁸⁶

It took a historic intervention by the Fed to break the cycle. This came in three parts and phases. First, the Federal Reserve Bank of New York announced a dramatic expansion of their repurchase facility, offering in principle to finance trillions of Treasuries and mortgage-backed securities issued or guaranteed by federal agencies.³⁸⁷ Only days later, the FOMC convened an emergency session to approve rate cuts (back to the zero bound) and also a sizeable and flexible open-ended QE program.³⁸⁸ Roughly a week later, at their previously scheduled meeting, the Committee approved purchases “in the amounts needed to support smooth market functioning and effective transmission of monetary policy to broader financial conditions.”³⁸⁹ This kind of unspecified commitment tied to outcomes rather than the quantity or pace of bonds to be purchased was a sharp and important departure from prior QE programs. Before long, the Fed was buying Treasuries and mortgage-backed securities at a combined pace of more than \$100 billion per day—noticeably more than

³⁸⁶ See Lorie K. Logan, Executive Vice President, The Federal Reserve’s Market Functioning Purchases: From Supporting to Sustaining, Remarks at SIFMA Webinar (July 15, 2020), <https://www.newyorkfed.org/newsevents/speeches/2020/log200715> [<https://perma.cc/FS2G-Z22A>].

³⁸⁷ See Statement Regarding Treasury Reserve Management Purchases and Repurchase Operations, FED. RSRV. BANK OF N.Y. (Mar. 12, 2020), https://www.newyorkfed.org/markets/opolicy/operating_policy_200312a [<https://perma.cc/UJ5T-EYAE>].

³⁸⁸ Press Release, Bd. of Governors of the Fed. Rsrv. Sys., Federal Reserve Issues FOMC Statement (Mar. 15, 2020), <https://www.federalreserve.gov/monetarypolicy/files/monetary20200315a1.pdf> [<https://perma.cc/5CG5-VCAP>] (“the Committee will increase its holdings of Treasury securities by *at least* \$500 billion and its holdings of agency mortgage-backed securities by *at least* \$200 billion”) (emphasis added).

³⁸⁹ Press Release, Bd. of Governors of the Fed. Rsrv. Sys., Federal Reserve Issues FOMC Statement (Mar. 23, 2020), <https://www.federalreserve.gov/newsevents/pressreleases/monetary20200323a.htm> [<https://perma.cc/F6NY-C6HW>].

was bought in a month as part of prior QE programs.³⁹⁰ Implementation notes retained very flexible language for months, authorizing the Federal Reserve Bank of New York to purchase securities “as needed to sustain smooth functioning of markets.”³⁹¹ Even as purchases shifted back towards a more traditional QE program around June, it was not until December that the Committee explicitly limited purchases to \$120 billion per month.³⁹²

Purchases and financing proved an effective treatment—transaction costs peaked in those frantic days in the second and third weeks of March 2020 and began to slowly normalize by the end of the month.³⁹³ There were, however, potentially severe side effects. When the Fed purchases securities, it “pays” for them with credits to member bank reserve accounts.³⁹⁴

The massive scale of the purchase program meant an equally rapid and dramatic increase in bank reserve balances, which increased nearly \$2 trillion in just the last two weeks of March alone.³⁹⁵ Because reserves can only be held by banks,

³⁹⁰ *Historical Transaction Data*, FED. RSRV. BANK OF N.Y., https://www.newyorkfed.org/markets/omo_transaction_data [<https://perma.cc/ML6Q-XDUW>]; *see also* MICHAEL FLEMING, HAORYANG LIU, RICH PODJASEK & JAKE SHURMEIER, FED. RSRV. BANK OF N.Y., *THE FEDERAL RESERVE’S MARKET FUNCTIONING PURCHASES* (2022).

³⁹¹ *See, e.g.*, Press Release, Bd. of Governors of the Fed. Rsr. Sys., Implementation Note Issued November 5, 2020 (Nov. 5, 2020), <https://www.federalreserve.gov/newsevents/pressreleases/monetary20201105a1.htm> [<https://perma.cc/7JFD-8JQX>].

³⁹² *Id.*

³⁹³ *See* Logan, *supra* note 388.

³⁹⁴ *See, e.g.*, Renee Haltom & Alexander L. Wolman, *A Citizen’s Guide to Unconventional Monetary Policy*, FED. RSRV. BANK OF RICHMOND ECON. BRIEF EB12-12, at 1 (Dec. 2012).

³⁹⁵ BD. OF GOVERNORS OF THE FED. RSRV. SYS., FEDERAL RESERVE STATISTICAL RELEASE, H.4.1 FACTORS AFFECTING RESERVE BALANCES: MARCH 12, 2020 (2020), <http://www.federalreserve.gov/releases/h41/20200312/> [<https://perma.cc/9PGM-A78F>]; BD. OF GOVERNORS OF THE FED. RSRV. SYS., FEDERAL RESERVE STATISTICAL RELEASE, H.4.1 FACTORS AFFECTING RESERVE BALANCES: MARCH 26, 2020 (2020), <https://www.federalreserve.gov/releases/h41/20200326/> [<https://perma.cc/BGC8-FBDV>].

those actions mechanically inflate the size of the banking system.³⁹⁶ As the system grew, leverage ratios became more binding, which in turn risked undermining the progress that the Fed's purchase program was making in restoring normal market functioning. In a nod to potential connection between regulatory constraints and stress in Treasury markets (and an interesting example of administrative discretion exercised in a law-and-macroeconomics framework),³⁹⁷ the Fed offered some relief via a temporary but material adjustment to the SLR: to "ease strains in the Treasury market resulting from the coronavirus,"³⁹⁸ a temporary redefinition of total leverage exposure for BHCs to exclude Treasuries and reserves, set to expire after one year.³⁹⁹

Although seemingly technical and arcane, this regulatory change was a strong response. Capital forbearance as a

³⁹⁶ The specific scenario, which is also the most common, is when non-banks sell Treasuries and other securities to the Fed via primary dealers. That involves two transactions, one in which the primary dealer purchases those bonds (a new asset) and credits the seller's deposit account (a new liability). They then sell those bonds to the Fed which creates a new liability to the banking system (reserves), which are, in turn, a new bank asset. Thus QE in a sense brings non-bank assets into the banking system and traps them there, mechanically increasing leverage. The reverse repo facility is an important pressure relief valve, but tends not to come into play until leverage is more strictly binding (and a full discussion of this dynamic is beyond the scope of this Article). See Gara Afonso, Lorie Logan, Antoine Martin, William Riordan & Patricia Zobel, *How the Fed's Overnight Reverse Repo Facility Works*, FED. RSRV. BANK OF N.Y. LIBERTY ST. ECON. (Jan. 11, 2022), <https://libertystreeteconomics.newyorkfed.org/2022/01/how-the-feds-overnight-reverse-repo-facility-works/> [<https://perma.cc/9BFZ-CRR4>].

³⁹⁷ Gabriel Rauterberg & Joshua Younger, *What is the Law's Role in a Recession?*, 135 HARV. L. REV. 1351 (2022).

³⁹⁸ Press Release, Bd. of Governors of the Fed. Rsrv. Sys., Federal Reserve Board Announces Temporary Change to its Supplementary Leverage Ratio Rule to Ease Strains in the Treasury Market Resulting from the Coronavirus and Increase Banking Organizations' Ability to Provide Credit to Households and Businesses (Apr. 1, 2020), <https://www.federalreserve.gov/newsevents/pressreleases/bcreg20200401a.htm> [<https://perma.cc/5VE9-8ESK>].

³⁹⁹ Temporary Exclusion of U.S. Treasury Securities and Deposits at Federal Reserve Banks from the Supplementary Leverage Ratio, 85 Fed. Reg. 20578 (Apr. 14, 2020) (to be codified at 12 C.F.R. pt. 217).

general matter has a checkered history, particularly in the U.S. and Japan.⁴⁰⁰ It also deviates from international standards set by Basel. While the most recent version of those guidelines for leverage ratios permits temporary adjustments to the exposure calculation “to facilitate the implementation of monetary policies,” they do so only with respect to central bank liabilities and require increasing “the calibration of the minimum leverage ratio requirement commensurately to offset the impact [of those changes].”⁴⁰¹ As Daniel Tarullo, a former member of the Board of Governors and scholar of banking law recently observed, these make the exclusion of Treasuries from the SLR, even temporarily, more notable.⁴⁰²

In theory,⁴⁰³ the Fed’s change increased overall intermediation capacity and elasticity at bank-affiliated

⁴⁰⁰ Rauterberg & Younger, *supra* note 399, at 1385–88.

⁴⁰¹ BASEL COMM. ON BANKING SUPERVISION, LEV30: EXPOSURE MEASUREMENT, LEVERAGE Ratio para. 30.7 (2023).

⁴⁰² DANIEL K. TARULLO, HUTCHINS CENTER ON FISCAL & MONETARY POL’Y AT BROOKINGS, CAPITAL REGULATION AND THE TREASURY MARKET 4–5 (2023), https://www.brookings.edu/wp-content/uploads/2023/03/Brookings-Tarullo-Capital-Regulation-and-Treasuries_3.17.23.pdf [<https://perma.cc/7ZBD-FCGU>].

⁴⁰³ There is some debate as to the efficacy of temporary regulatory relief in practice. Banks are generally risk averse when it comes to incorporating new rules into their business planning and resource allocation. For example, during the J.P. Morgan conference call in July 2020 discussing quarterly earnings, then Chief Financial Officer Jenn Piepszak noted in reference to the temporary SLR changes “it’s worth noting that we’re not going to rely on temporary relief” and that she doesn’t “necessarily think about that as temporary like SLR. SLR, at this point, . . . is temporary. It is due to expire in the first quarter of next year which is why we’re very focused on managing that without big exclusions.” Transcript, JPMorgan Chase & Co., 2Q20 Financial Results: Earnings Call Transcript (Jul. 14, 2020) (<https://www.jpmorganchase.com/content/dam/jpmc/jpmorgan-chase-and-co/investor-relations/documents/quarterly-earnings/2020/2nd-quarter/2q20-earnings-transcript.pdf> [<https://perma.cc/B8W4-WBKG>])). She reiterated that view after first quarter 2021 earnings: “As we’ve said all along, we were never going to rely on short-term temporary relief as a long-term planning matter, and this is evidenced by actions we’ve taken.” Transcript, JPMorgan Chase & Co., 1Q21 Financial Results: Earnings Call Transcript (Apr. 14, 2021) (<https://www.jpmorganchase.com/content/dam/jpmc/jpmorgan-chase-and->

dealers in two ways. First, it created new leverage capacity as a general matter—the consolidated SLR ratio among the four largest commercial banks as of the first quarter of 2020 was 7.0% with the relief as compared to 6.1% without, and for the former investment banks the ratio was 6.9% compared to 6.0%.⁴⁰⁴ With much more room to maneuver, banks could take on additional leverage for a range of activities without having to make hard decisions elsewhere. That could have proved especially helpful in managing more dynamic business segments that could be ramped up and down quickly, like short-term lending (repo) and market-making. Second, it specifically exempted Treasury securities from the ratio calculation, including those held in inventory by the dealer subsidiaries of BHCs. That could have provided some market-making desks with additional capacity to grow their footprint tactically without impacting the broader leverage capital requirements of the firm.

Although it is difficult to convincingly estimate the relative impact of these purchases and regulatory changes on Treasury market functioning, their combined effect was fairly clear. Transaction costs normalized by May 2020.⁴⁰⁵ Thus ended the second shadow banking system collapse. This time, the fireworks were concentrated in a very different corner of the market—not in mispriced credit risk, but in riskless assets themselves. But the GFC and COVID panic share two

co/investor-relations/documents/quarterly-earnings/2021/1st-quarter/1q21-earnings-transcript.pdf [<https://perma.cc/FT46-WNM6>]).

⁴⁰⁴ These data are based on disclosure for the second quarter of 2020 from the “Regulatory Capital Reporting for Institutions Subject to the Advanced Capital Adequacy Framework” (Form 101; <https://www.ffiec.gov/forms101.htm>) from the Federal Financial Institutions Examination Council (FFIEC). The four largest commercial banks are J.P. Morgan, Chase & Co. (RSID 1039502), Bank of America Corporation (1073757), Citigroup Inc. (1951350), and Wells Fargo & Company (1120754); the former investment banks are The Goldman Sachs Group, Inc. (2380443) and Morgan Stanley (2162966). We specifically use “total leverage exposure” (RSSID H015), “Adjustments for deductions of qualifying central bank deposits for custodial banking organizations” (the carve-outs; LB41), and the reported SLR (H015).

⁴⁰⁵ Logan, *supra* note 388, at Fig. 7(a).

important traits in common. Both saw money-financed intermediation pushed outside the banking perimeter by a mix of intended and unintended consequences of policy and administrative decisions. And both saw the collapse of that system when it proved less than resilient to shocks.

V. A MONEY VIEW OF TREASURY MARKET REFORM

Unsurprisingly, there has been a robust policy dialogue around potential reforms to Treasury market structure to address the frailties revealed by the events of March 2020. A range of recommendations—though with a number of commonalities—have come from large groups of academics and former regulators,⁴⁰⁶ smaller collaborations,⁴⁰⁷ trade organizations,⁴⁰⁸ the Inter-Agency Working Group representing a number of regulatory stakeholders,⁴⁰⁹ and individual agencies. Among those proposals, most significant reforms are focused on bank capital requirements and their impact on dealer capacity. The Group of Thirty Report, for example, argues for “identifying provisions that could be modified to avoid disincentivizing market intermediation, without weakening overall resilience of the banking system.”⁴¹⁰

⁴⁰⁶ See, e.g., G30 WORKING GRP. ON TREASURY MKT. LIQUIDITY, U.S. TREASURY MARKETS: STEPS TOWARD INCREASED RESILIENCE (2021) and GLENN HUBBARD ET AL., HUTCHINS CTR. ON FISCAL & MONETARY POL’Y AT BROOKINGS & CHI. BOOTH INITIATIVE ON GLOB. MRKTS., TASK FORCE ON FINANCIAL STABILITY 34–52 (2021).

⁴⁰⁷ See, e.g., Liang & Parkinson, *supra* note 12; Yadav, *supra* note 12.

⁴⁰⁸ Arguably the original proposal comes from Duffie, *supra* note 25.

⁴⁰⁹ U.S. DEP’T OF THE TREASURY, BD. OF GOVERNORS OF THE FED. RSRV. SYS., FED. RSRV. BANK OF N.Y., U.S. SEC. & EXCH. COMM’N, U.S. COMMODITY FUTURES TRADING COMM’N, RECENT DISRUPTIONS AND POTENTIAL REFORMS IN THE U.S. TREASURY MARKET: A STAFF PROGRESS REPORT (2021).

⁴¹⁰ See G30 WORKING GRP. ON TREASURY MKT. LIQUIDITY, *supra* note 408, at 16.

This Part reviews potential reforms designed to improve the functioning of the Treasury market under stress.⁴¹¹ Most have been presented in greater detail elsewhere. We do not attempt to identify a best path forward, but instead to compare and contrast the options. It is also important to note that these proposals are generally designed to adjust incentives to reduce the cost of intermediation elasticity for government securities dealers, particularly those housed within BHCs. They are less focused on the market and other risk factors which can be a significant determinant of overall liquidity conditions and market functioning.⁴¹² These proposals are also specifically concerned with market making, which involves short-term buying and selling of securities while taking relatively little directional risk; portfolio holdings, on the other hand, come with significant outright exposure to interest rates, as has been discussed at length in the context of stress among regional banks.⁴¹³

⁴¹¹ More recently, some researchers have considered how best to execute market-function purchases under the assumptions that, while not desirable and ideally relegated to very extreme environments, they will sometimes prove necessary. See DARRELL DUFFIE & FRANK KEANE, FED. RSRV. BANK OF N.Y., MARKET FUNCTION ASSET PURCHASES (Feb. 2023), https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr1054.pdf [<https://perma.cc/P5YH-ZHAR>],

⁴¹² See e.g., Alice Abboud, Chris Anderson, Aaron Game, Diana Iercosan, Hulusi Inanoglu & David Lynch, *Banks' Backtesting Exceptions during the COVID-19 Crash: Causes and Consequences*, FEDS NOTES (July 8, 2021), <https://www.federalreserve.gov/econres/notes/feds-notes/banks-backtesting-exceptions-during-the-covid-19-crash-causes-and-consequences-20210708.html> [<https://perma.cc/7JF2-64AA>].

⁴¹³ E.g., Jerome Legras, *Silicon Valley Bank Crash is a Red Flag on Rate Risk*, FIN. TIMES (Mar. 14, 2023), <https://www.ft.com/content/02576e3c-67c8-4a7c-86b3-bc9c270a90b6> [<https://perma.cc/2DK2-DKJ2>]; Robin Wigglesworth, *How Crazy Was Silicon Valley Bank's Zero-Hedge Strategy?*, FIN. TIMES (Mar. 17, 2023), <https://www.ft.com/content/f9a3adce-1559-4f66-b172-cd45a9fa09d6> [<https://perma.cc/K7JR-VGTS>]; Itamar Drechsler, Alexi Savov & Philipp Schnabl, *Why Do Banks Invest In MBS?* (Mar. 13, 2023) (unpublished manuscript), https://pages.stern.nyu.edu/~pschnabl/research/DSS_SVB.pdf [<https://perma.cc/LF6F-YP6M>]; Itamar Drechsler, Alexi Savov & Philipp Schnabl, *How To Value the Deposit Franchise* (unpublished manuscript), https://pages.stern.nyu.edu/~asavov/alexisavov/Alexi_Savov_files/Deposit_

One approach targets bank capital requirements (among other objectives) somewhat narrowly through a broad clearing mandate for the Treasury market.⁴¹⁴ Although a variety of potential implementations are still being debated, broadly speaking, such a mandate would likely function along the lines of similar requirements in derivatives markets.⁴¹⁵ Under the most recent SEC proposal, the vast majority of secondary market and repo trading in Treasuries would ultimately face a single, centralized counterparty (CCP) which would stand behind all transactions.⁴¹⁶ Among other benefits,⁴¹⁷ this would reduce the footprint of repo in total leverage exposure by allowing dealers to net more positions against each other, which, in turn, would reduce both the measure itself and its dynamics due to growth of repo intermediation.⁴¹⁸ In

Franchise_Valuation.pdf [<https://perma.cc/6PD9-MVGV>]; Alexi Savov, Banks and Interest Rates (unpublished PowerPoint), https://pages.stern.nyu.edu/~asavov/alexisavov/Alexi_Savov_files/SVB_Savov.pdf [<https://perma.cc/D3XD-Z3FN>]; Stephan Luck, Matthew Plosser & Josh Younger, *How Do Interest Rates (and Depositors) Impact Measures of Bank Value?*, LIBERTY ST. ECON. (Apr. 7, 2023), <https://libertystreeteconomics.newyorkfed.org/2023/04/how-do-interest-rates-and-depositors-impact-measures-of-bank-value/> [<https://perma.cc/MMG7-9GHG>].

⁴¹⁴ See Duffie, *supra* note 25.

⁴¹⁵ 17 C.F.R. pts. 37, 38, 39, 50.

⁴¹⁶ Standards for Covered Clearing Agencies for U.S. Treasury Securities and Application of the Broker-Dealer Customer Protection Rule with Respect to U.S. Treasury Securities, 87 Fed. Reg. 64610 (proposed Oct. 25, 2022) (to be codified at 17 C.F.R. pt. 240).

⁴¹⁷ Its proponents also claim a broad clearing mandate for the Treasury market would reduce the risk of failures to deliver and other forms of broken settlement, improve market transparency, increase the netting efficiency of repo exposures and improve elasticity of intermediation, and facilitate cross-margining of cash and derivatives positions to reduce the impact of margin cycles. See Darrell Duffie, *Still the world's safe haven? Redesigning the U.S. Treasury market after the COVID-19 crisis*, BROOKINGS (June 22, 2020), <https://www.brookings.edu/articles/still-the-worlds-safe-haven/>.

⁴¹⁸ The repo component of total leverage exposure allows for economic offsets of long (repo) and short (reverse) repo positions that meet the requirements of the Financial Accounting Standards Board (FASB). Among those are the same counterparty and maturity date. FIN ACCT. STANDARDS BD., ORIGINAL PRONOUNCEMENTS: FASB INTERPRETATION NO. 41:

principle, this change would make it easier for the market to grow in response to demand shocks. That said, repo clearing is already broadly available in principle to nonbanks through the sponsored service⁴¹⁹ offered by the Fixed Income Clearing Corporation (FICC)—by far the largest clearinghouse for the Treasury market—even if access can prove operationally challenging at times in practice. To the extent that sponsored repo is already used efficiently, the incremental increase in netting offered by a broad mandate, and by extension the improvement in balance sheet capacity relative to the current market structure, would likely be modest. It would also not directly address the capital costs associated with holding large inventories of securities. That is not to say clearing would not offer other benefits.⁴²⁰

Those looking to go further support adjusting the SLR itself.⁴²¹ The most logical place to start would be by excluding central bank liabilities (reserves) from the exposure measure. Reserves are riskless, fungible payment instruments that never change in “price.”⁴²² Although international standards maintained by Basel allow for such an exemption, they

OFFSETTING OF AMOUNTS RELATED TO CERTAIN REPURCHASE AND REVERSE REPURCHASE AGREEMENTS, AN INTERPRETATION OF APB OPINION NO. 10 AND A MODIFICATION OF FASB INTERPRETATION NO. 39. (2008). Thus, a market with a central counterparty to the vast majority of trades would have high levels of netting than one with a significant bilateral segment and therefore many more counterparties.

⁴¹⁹ J.P. MORGAN, A PRIMER ON SPONSORED REPO: HOW HAS THE WORLD OF FIXED-INCOME FINANCING EVOLVED? (2019).

⁴²⁰ Standards for Covered Clearing Agencies for U.S. Treasury Securities and Application of the Broker-Dealer Customer Protection Rule with Respect to U.S. Treasury Securities, Securities Act Release No. 34-95763 (Sept. 14, 2022).

⁴²¹ See, e.g., Daniel K. Tarullo, *Capital Regulation and the Treasury Market*, BROOKINGS (Mar. 17, 2023), <https://www.brookings.edu/research/capital-regulation-and-the-treasury-market/> [<https://perma.cc/59TK-NYKX>]; Liang & Parkinson, *supra* note 12.

⁴²² In many ways, all other financial assets can be said to be denominated in reserve units. That means their “value” is precisely defined as the reserves that they can conceptually receive in exchange for a transfer of ownership.

require it be temporary⁴²³ and paired with a recalibration in minimum regulatory ratios to maintain the total quantum of required bank capital.⁴²⁴ Were the U.S. to strictly follow Basel guidelines, their more important impact would be to mitigate the risk that new reserves created through QE operations increase the total leverage exposure of the banking system. That would, in effect, sever the link between bank capital and the size of the Fed's balance sheet, thus avoiding the pressure to offer forbearance in some future crisis. But they would not provide any outright capital relief, which would leave the current constraints—arising from both institutional requirements and business processes—largely intact. Even if the U.S. were to run afoul of Basel,⁴²⁵ the impact of excluding reserves on SLR would hardly be a game-changer for capital planners, and even more modest where the Fed's balance sheet is smaller.⁴²⁶

⁴²³ See *supra* note 403 for a discussion of the utility of temporary changes to banking regulations.

⁴²⁴ BASEL COMM. ON BANKING SUPERVISION, *supra* note 403, at para 30.4.

⁴²⁵ An assessment of U.S. rules conducted by the Bank for International Settlements in 2014, for example, found “material deviations” in several areas. BASEL COMM. ON BANKING SUPERVISION, REGULATORY CONSISTENCY ASSESSMENT PROGRAMME (RCAP) ASSESSMENT OF BASEL III REGULATIONS – UNITED STATES OF AMERICA (2014). More recently the temporary SLR relief provided by the Fed in April 2020 both included Treasuries and did not recalibrate minimum ratios. Temporary Exclusion of U.S. Treasury Securities and Deposits at Federal Reserve Banks from the Supplementary Leverage Ratio, 85 Fed. Reg. 20578 (Apr. 14, 2020) (to be codified at 12 C.F.R. pt. 217).

⁴²⁶ For example, as of the second quarter of 2022, public disclosure indicates that the aggregate SLR of the largest money center banks (typically J.P. Morgan, Bank of America, Citibank, and Wells Fargo) and former broker/dealers (Goldman Sachs and Morgan Stanley) was roughly 5.6% relative to a regulatory minimum of 5%; if reserves were excluded from the denominator of that ratio (total leverage exposure) it would increase to 6.0%. That adjustment is hardly a game changer—for context, as of the end of 2019, when reserves were close to the lows of the last cycle, the consolidated SLR for those same banks was 6.4% (6.6% with reserves excluded). Reserve balances are disclosed on a quarterly basis in Call Reports for commercial banks (Form 031, Schedule RC-A, item RCFD0090) released at the Central Data Repository maintained by the FFIEC and

An even more significant change would be to exclude on-balance sheet Treasuries, and potentially even Treasury repo, from total leverage exposure calculations. Doing so would have a greater headline impact on bank capital requirements.⁴²⁷ That would in turn create much more excess leverage capital which large banks could allocate to Treasury dealing. If Treasuries were rendered invisible to the SLR, bank-affiliated dealers would have more flexibility to grow their inventories in response to market conditions without incurring additional capital costs. It would, however, be a much more material deviation from international standards.⁴²⁸ Recent events⁴²⁹ also highlight the fact that Treasuries held outright in bank portfolios (as opposed to market making inventories) are far from riskless—a point raised by Nellie Liang and Pat Parkinson in their analysis of Treasury market structure published in late 2020.⁴³⁰ More

available on their website. *Central Data Repository's Public Data Distribution*, FED. FIN. INST. EXAMINATION COUNCIL, <https://cdr.ffiec.gov/public/ManageFacsimiles.aspx> [<https://perma.cc/L6MQ-XPSF>]. Total leverage exposure and SLR measures are also provided by the FFIEC on roughly the same quarterly schedule at the consolidated bank holding company level (Form 101, Schedule A, Items H015 and H036) and available on a different website. *Large Holding Companies*, NIC NAT'L INFO. CTR., <https://www.ffiec.gov/npw/Institution/TopHoldings> [<https://perma.cc/Y56P-NSYN>].

⁴²⁷ As of the first quarter of 2022, the aggregate SLR estimated earlier would have been 6.6% if both Treasuries and reserves were excluded (versus 5.4% under current law and 6.0% excluding reserves); in the fourth quarter of 2019 it would have been 7.1% (versus 6.4% under current law and 6.6% excluding reserves). Treasury holdings for the consolidated holding company are reported quarterly in FFIEC disclosure (Form FR Y-9C) split into held-for-trading (Schedule HC-D, Item BHCM 3531), held-to-maturity (Schedule HC-B, Item BHCK 0211), and available-for-sale (Schedule HC-B, Item BHCK 1286) accounting designations.

⁴²⁸ See also Tarullo, *supra* note 404.

⁴²⁹ *US Banks Have \$620 Billion of Unrealized Losses on Their Books*, BLOOMBERG (Mar. 31, 2023), <https://www.bloomberg.com/graphics/2023-svb-exposed-risks-banks/> [<https://perma.cc/GP2D-8WF2>].

⁴³⁰ Nellie Liang & Pat Parkinson, *Enhancing Liquidity of the U.S. Treasury Market Under Stress* 3, 11 (Hutchins Ctr. Working Paper #72, 2020).

generally, when it comes to regulating the amount and nature of leverage in the banking system, the GFC still casts a long shadow. And experience suggests that deviating far from international standards is difficult absent a sense of crisis-driven urgency.

A twist on exempting Treasuries⁴³¹ would be for the Fed to maintain current rules but be more explicit about relaxing them under “exigent circumstances.” The market may already presume this to some extent—there is, of course, one important and recent precedent from April 2020.⁴³² But being more explicit offers, as Daniel Tarullo has described, the advantage of allowing banks and bank-affiliated dealers to update their crisis “playbook.”⁴³³ Although actually using buffers can be complicated in practice, in principle having a contingency plan that assumes leverage relief, potentially including Treasuries, would facilitate the ability of business processes to adapt more quickly if and when the time comes.

Another potential reform begins with a restatement of the problem. One could argue that the critical importance of the Treasury market motivates supporting its smooth functioning with access to the same federal safety net and protections extended to core banking activities.⁴³⁴ Granting a specialized subsidiary that deals exclusively in Treasury securities access to deposit funding would bring that activity more explicitly into the core of the banking system. Rather than indirect support via the repo market—in the form of temporary open

⁴³¹ *Id.*

⁴³² Duffie and Keane describe a similar mechanism in the context of anticipated market-function purchases by the central bank or fiscal authority. Tarullo, *supra* note 404, at 5.

⁴³³ Tarullo, *supra* note 404, at 7.

⁴³⁴ Importantly, we are only considering the functioning of the market. Dealers would still be exposed to the market risk associated with intermediating potentially volatile financial instruments with high levels of leverage.

market operations,⁴³⁵ the Standing Repurchase Facility,⁴³⁶ and the shadow banking system—Treasury dealing could be supported by direct access to Fed liquidity and federal deposit insurance. The result would be stable, low-cost funding that allows for a much nimbler and more elastic dealer complex on the one hand, and strong incentives to bring this activity back inside the bank regulatory perimeter, which comes with extensive disclosure and supervisory oversight, on the other. This was presumably what legislators had in mind when they specifically exempted dealing in government securities from the separation of dealing and commercial banking in the Banking Act of 1933.⁴³⁷ It would, however, potentially require two specific sets of rule changes to be effective.

First, balance sheet capacity could be addressed with a narrow SLR exemption. Carving a dedicated Treasury dealer subsidiary's assets out of exposure measures could dramatically increase its ability to grow its inventory (sometimes referred to as intermediation elasticity) without having a material impact on the overall SLR or its impact on broader banking system incentives.⁴³⁸ That would also focus

⁴³⁵ See for example the Fed's intervention in repo markets during the fall of 2019. Lorie Logan, Senior Vice President, Fed. Rsv. Bank of N.Y., Remarks before the Money Marketeers of New York University, New York City: Implementing Monetary Policy: Perspective from the Open Market Trading Desk (May 18, 2017), <https://www.newyorkfed.org/newsevents/speeches/2017/log170518> [<https://perma.cc/3W48-CLDJ>].

⁴³⁶ See Gara Afonso, Lorie Logan, Antoine Martin, William Riordan & Patricia Zobel, *The Fed's Latest Tool: A Standing Repo Facility*, FED. RSRV. BANK OF N.Y. LIBERTY ST. ECON. (Jan. 13, 2022), <https://libertystreeteconomics.newyorkfed.org/2022/01/the-feds-latest-tool-a-standing-repo-facility/> [<https://perma.cc/V9GK-DLW7>].

⁴³⁷ Banking Act of 1933, Pub. L. 66-73D at § 7, 48 Stat. 162 (1933). "The limitations and restrictions herein contained as to dealing in, underwriting and purchasing for its own account, investment securities shall not apply to obligations of the United States, or general obligations of any State or of any political subdivision thereof, or obligations issued under authority of the Federal Farm Loan Act, as amended, or issued by the Federal Home Loan Banks or the Home Owners' Loan Corporation." *Id.*

⁴³⁸ Based on public disclosures, Treasury securities that are designated as trading assets for accounting purposes made up only 23% of total

specifically on Treasuries associated with market making activities, which are generally hedged with futures and other derivatives and for which mark-to-market gains and losses are recognized on the income statement. Portfolio holdings, which are often a material source of interest rate risk and can be held at amortized cost,⁴³⁹ would be out of scope. Though not strictly Basel-compliant, this would constitute a much lesser deviation from their standard than other proposals while having a comparable impact on intermediation capacity and elasticity. It would also not be costless for banks to redesignate or accumulate large quantities of Treasuries as trading assets, since gains and losses in the fair value of those assets are included in earnings⁴⁴⁰ and contribute to market risk exposure in RWA. That would, in principle, reduce the risk of regulatory arbitrage.

Second, that subsidiary could be allowed to fund itself with a line of credit or standing repo offering from the banking entity that mimics the cost and stability of traditional deposits. Doing so would potentially require a narrow exemption from existing rules, in this case Regulation W

Treasury holdings and less than 2% of total leverage exposure as of the first quarter of 2022. See *Large Holding Companies*, NAT'L INFO. CTR. (March 31, 2023), <https://www.ffiec.gov/npw/Institution/TopHoldings>.

⁴³⁹ This is generally true of securities designated held-to-maturity for accounting purposes. FIN. ACCT. STANDARDS BD., GAAP TAXONOMY IMPLEMENTATION GUIDE (2021), https://xbrl.fasb.org/impguidance/DS_TIG/debtsecurities_1.pdf [<https://perma.cc/D27W-UC8N>].

⁴⁴⁰ There are three accounting designations for securities held by bank holding companies. Held-to-maturity (HTM) are accounted for on an amortized cost basis but are difficult to sell. Changes in the fair value of available-for-sale securities are recognized, but through capital impairments rather than as income. Trading assets are marked to market, and the gains or losses recognized as income. FIN. ACCT. STANDARDS BD., SUMMARY OF STATEMENT NO. 115: ACCOUNTING FOR CERTAIN INVESTMENTS IN DEBT AND EQUITY SECURITIES (1993), <https://www.fasb.org/page/PageContent?pageId=/reference-library/superseded-standards/summary-of-statement-no-115.html&bcpath=tff> [<https://perma.cc/KH7L-95WH>].

which governs inter-affiliate transactions.⁴⁴¹ That set of rules has two parts: one which sets qualitative and quantitative limits⁴⁴² on “covered transactions”⁴⁴³ including extensions of credit, and another which requires those transactions be on “market terms” or carry an interest rate equal to what a third party would be offered for a comparable arrangement.⁴⁴⁴ In both cases, the Fed is authorized to provide, and has in the past provided, exemptions,⁴⁴⁵ including broad-based suspensions of the rules.⁴⁴⁶

⁴⁴¹ Regulation W implements Sections 23A and 23B of the Federal Reserve Act. 12 C.F.R. pt. 223. Congress added section 23A to the Federal Reserve Act in the Banking Act of 1933, Pub. L. 66–73D, 48 Stat. 162 (1933) and Section 23B in the Competitive Equality Banking Act of 1987, Pub. L. 100–8, 101 Stat. 552 (1987). Together they regulate the nature, quantity, terms and pricing of “covered transactions” between bank and nonbank affiliates within a bank holding company and are designed to safeguard depositors and avoid the extension of federal subsidies (liquidity backstops, deposit insurance) to speculative activity like securities dealing. Saule T. Omarova, *From Gramm-Leach-Bliley to Dodd-Frank: The Unfulfilled Promise of Section 23A of the Federal Reserve Act*, 89 N.C. L. REV. 1683 (2011).

⁴⁴² 12 C.F.R. § 23.3(h).

⁴⁴³ 12 C.F.R. § 223.14.

⁴⁴⁴ Defined for the purposes of the regulation as “[o]n terms and under circumstances, including credit standards, that are substantially the same, or at least as favorable to the member bank, as those prevailing at the time for comparable transactions with or involving nonaffiliates.” 12 C.F.R. § 223.51(a).

⁴⁴⁵ For an overview, see Omarova, *supra* note 443.

⁴⁴⁶ For example, the Federal Reserve reportedly offered a broad suspension of qualitative and quantitative limits on inter-affiliate transactions while encouraging banks to support the liquidity of their dealers after the September 11, 2001 terrorist attacks. Christopher Neely, *The Federal Reserve’s Response to the Sept. 11 Attacks*, FED. RSRV. BANK OF ST. LOUIS (Jan. 1, 2002), <https://www.stlouisfed.org/publications/regional-economist/january-2002/the-federal-reserves-response-to-the-sept-11-attacks> [<https://perma.cc/FAJ5-6V4G>]; Anita Raghavan, Susan Pulliam & Jeff Opdyke, *Banks and Regulators Drew Together to Calm Rattled Markets After Attack*, WALL ST. J., Oct. 18, 2001; Arthur E. Wilmarth, *The Transformation Of The U.S. Financial Services Industry, 1975–2000: Competition, Consolidation, And Increased Risks*, 2002 Univ. Ill. L. Rev., 215, 472 (2002). In 2008, the Fed offered numerous exemptions including one designed to support the tri-party repo market. *Transactions Between*

The only legal requirement is that doing so must be demonstrably “in the public interest” and “consistent with the purpose” of those provisions. Many in the official and private sectors have argued that the public interest is served by a deep, broad, and resilient Treasury market.⁴⁴⁷ Further, the Banking Act of 1933 singles out Treasury securities (among a handful of others) as special assets deserving of special treatment under banking regulations.⁴⁴⁸ That suggests that its authors did not intend an outright prohibition on commingling Treasury dealing and deposit banking.

A targeted approach to hardening the Treasury market against futures stressors therefore could involve narrow exemptions for narrow subsidiaries that exclusively deal in Treasury securities from Regulation W to safeguard their ability to manage a highly dynamic balance sheet and secure stable and low-cost funding. This would bring Treasury dealing back inside the bank regulatory perimeter and make more direct use of federal subsidies and guarantees without unintentionally supporting a much broader market in money-

Member Banks and Their Affiliates: Exemption for Certain Securities Financing Transactions Between a Member Bank and an Affiliate, 73 Fed. Reg. 54307 (Apr. 14, 2020) (to be codified at 12 C.F.R. pt. 233). Finally in 2020 the Fed provided template letters to facilitate ad-hoc requests for exemptions related to transactions with both affiliated money market funds, Template Letter on Money-Market Funds from Ann E. Misback, Sec’y, Bd. of Governors of the Fed. Rsrv. Sys. (Mar. 17, 2020), <https://www.federalreserve.gov/supervisionreg/legalinterpretations/fedrese-rseactint20200317.pdf> [<https://perma.cc/72BV-JLQW>], and broker/dealers, Template Letter on Broker-Dealers from Ann E. Misback, Sec’y, Bd. of Governors of the Fed. Rsrv. Sys. (Mar. 18, 2020), <https://www.federalreserve.gov/supervisionreg/legalinterpretations/fedrese-rseactint20200318.pdf> [<https://perma.cc/U3ZX-WQVA>].

⁴⁴⁷ See, e.g., U.S. DEPT. OF THE TREASURY ET AL., *supra* note 411, at 1 (arguing that a deep and liquid Treasury market lowers the cost to taxpayers of financing the government, supports the stable flow of capital and credit to households and businesses by establishing a benchmark credit-risk-free yield curve, and improves the transmission of monetary policy).

⁴⁴⁸ Banking Act of 1933, Pub. L. 66–73D at § 7, 48 Stat. 162 (1933); see *supra* note 437.

like claims or deviating significantly from international bank regulatory standards.

VI. CONCLUSION

From the start, the “breadth, depth, and resiliency” of Treasury markets has turned on monetary system design.⁴⁴⁹ In the 1950s, Fed officials, relying on purchase and sale transactions conducted under their §14 authority rather than on loans extended under §13(3) or §13(13), created a new market for financial instruments (repo) that looked quite similar to, and in several important ways were more attractive than, deposits and other money claims. By providing a liquidity backstop at an administered rate and (eventually) preferential treatment under the Bankruptcy Code, policy makers attracted a broad and diverse group of potential cash providers; regulation of its government securities dealers under an investor protection framework allowed for higher levels of leverage than would be allowed for depository institutions. The result was a curious tension: intermediating Treasury markets was important enough to garner significant public sponsorship and support, but its providers were not systemically important enough to be subject to the same level of prudential oversight as banks. The arrangement led the U.S. financial system down a path towards increased reliance on shadow banking. While many factors contributed to the GFC in 2008, it seems at least plausible that Martin’s Fed set in motion a series of events that contributed to what eventually transpired.

The 2010s offered a brief period during which dealer activity was consolidated inside the banking perimeter. That, however, did not ultimately last long in practice. New regulatory requirements that assigned a cost to leverage agnostic of risk once again pushed Treasury and repo intermediation in the direction of non-banks. The players were admittedly different—PTFs and other HFTs taking on

⁴⁴⁹ Indeed, as we’ve argued, the federal government has engaged in forms of monetary finance since the War of 1812 and has developed legal structures to facilitate indirect monetary finance since the Civil War.

one aspect of market making (trade matching), and RV hedge funds the other (inventory management)—they too relied on easy access to cheap and available repo funding for their activities. And once again, that system proved vulnerable to shocks.

The present moment presents yet another opportunity for reflection. It is also a critical phase in the financial history of the U.S. and the dollar. The trajectory of mandatory federal spending points to a secular widening of deficits over the medium- to long-term. Ensuring markets keep pace with that growth remains, as Chairman Martin observed back in 1959, “obviously needed for the functioning of our financial mechanism.”⁴⁵⁰ Absent reform, one possibility is another panic. That is certainly one way to interpret the second Treasury market functioning event of the post-Accord era: the 1958 funding squeeze, which bears some important similarities to recent events.⁴⁵¹

A number of reforms have been proposed to reduce the risk of that outcome. Most are aimed to some extent at giving banks a greater role in that market, but they vary in intent and effectiveness. An outstanding question for policy makers is more of a first principles approach: should Treasury intermediation occur inside, rather than outside, the banking perimeter? To the extent that its systemic importance is similar to that of the banking and monetary system more broadly, as recent events and policy responses suggest, locating intermediation within the banking system would appear preferable. It would, however, come with costs, particularly the extraordinary challenge of executing fundamental changes in the market structure and demand base for U.S. government debt. Although there are no easy answers, there is value in clearly articulating the principles

⁴⁵⁰ *The Government Securities Market and Economic Growth: Hearing Before the J. Econ. Comm.*, 86th Cong. 1 (1959) (statement of William McChesney Martin, Jr., Chairman, Bd. of Governors of the Fed. Rsrv. Sys.), <https://fraser.stlouisfed.org/archival-collection/william-mcchesney-martin-jr-papers-1341/hearings-473021> [<https://perma.cc/4SHX-EVC3>].

⁴⁵¹ R. JAY KAHN & VY NGUYEN, *TREASURY MARKET STRESS: LESSONS FROM 1958 AND TODAY*, OFF. OF FIN. RSCH. (2022), at 1.

and goals against which these costs and benefits will be measured and weighed.