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LAST-RESORT LENDING
CLASSICAL THOUGHT VS. MODERN FEDERAL RESERVE PRACTICE

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Abstract

At the dawn of the 19th century, Henry Thornton explained why the Bank of England should expand its lending in response to banking crises, a role that has become known as the "lender of last resort." Walter Bagehot later popularized this idea, and it has been widely invoked to explain and justify 21st-century central bank credit extension. This paper examines the British monetary system of the late 18th and early 19th centuries and compares the recommendations of Thornton and Bagehot with recent Federal Reserve credit market interventions. Although both involve central bank credit extension, important differences emerge. Federal Reserve lending programs during the 2007–9 financial crisis were inconsistent with the prescriptions of Thornton or Bagehot because they were either sterilized or irrelevant to the type of monetary instability they sought to address. Moreover, both recommended against central bank lending targeted at particular sectors or borrowers and denied policy-relevant credit market imperfections. The special governance arrangements pertaining to Bank of England advances to the Crown may explain why Thornton and Bagehot recommended lending to the private sector rather than equivalent open market purchases of government securities, even though they understood the latter as an equally effective remedy. The contrast between classical thought and modern central banking suggests that the evolution of central bank practice over the past two centuries, from lending in the service of monetary stability to lending for its own sake, has been driven by governance and political considerations.

JEL codes: B1, B2, E4, E5, N1, N2

Keywords: monetary policy, central banking, lender of last resort, Federal Reserve, Bank of England, Henry Thornton, Walter Bagehot, Great Financial Crisis

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The scope and scale of the Federal Reserve's (Fed's) credit extension grew dramatically in 2008. Fed lending, which had averaged under $250 million a day in the five years before August 2007, peaked at over $400 billion in October of 2008.[1] Many central bank officials and commentators have justified the Fed's crisis credit programs by describing them as consistent with a long-standing idea of the central bank acting as "lender of last resort."[2] References by central bank officials to Walter Bagehot, whose 1873 book *Lombard Street: A Description of the Money Market* is the most widely cited source for the idea, proliferated in the wake of the 2008 crisis (Carre and Leloup 2020). The true origin of the idea, however, is in the writings of Henry Thornton ([1802] 1939) at the end of the 18th century (Humphrey 1975; Hetzel 1987; Goodhart 1999, 340–43; Meltzer 2003, 26), where one finds a clear and arguably more complete account of both the economics of the British monetary system and how the Bank of England should respond to banking panics. Comparing the original accounts of Thornton and Bagehot with the Federal Reserve's 21st-century actions can help assess the appeal to classical thought and illuminate the evolution of central bank lending over the past two centuries.

Many writers since the 2008 crisis have compared central banks' credit market interventions with a checklist distillation of Bagehot's policy recommendations: In the face of a panic, the central bank should lend freely at a high interest rate to solvent borrowers on good collateral. Brian Madigan (2009), for example, mounts a brave defense of the consistency of Federal Reserve credit market

1. Author's calculations based on information from the FRED database. See the data appendix for details.
2. See the statements of Frederic Mishkin (FOMC 2007c, 105; 2007d, 89); the statements of Randall Kroszner (FOMC 2007b, 41; 2008a 40); and the statement of Timothy Geithner (FOMC 2008b, 20–21). In his memoir, former Fed chair Ben Bernanke (2015, 243) recalled that "we saw our responses to the panic as fulfilling the classic central banking role of lender of last resort." See also Bernanke (2010, 5; 2013a, 5; 2013b, 4; 2015, 45–46); Bernanke et al. (2019, 34–40); Geithner (2014, 118–19, 521).

interventions with Bagehot's prescriptions, while Thomas Humphrey (2010) and Thomas Hogan, Linh Le, and Alexander Salter (2015) offer spirited critiques of how the Fed has strayed.[3] Much about banking and finance has changed since the lender-of-last-resort idea first emerged. Evaluating whether credit market interventions under the banner of "lender of last resort" are faithful to the original idea requires going beyond a simple checklist and considering the economic and legal environment facing the historical Bank of England. What economic problems were Bagehot's prescriptions meant to solve? Textbooks say it was to stem a "financial panic," but for Thornton and Bagehot, as we will see, that term had a specific meaning—thwarting a contraction in the money supply. In late 18th-century England, with size-constrained and poorly diversified country banks circulating their notes and with clearing and settlement reliant on Bank of England notes, the fractional reserve banking system was vulnerable to runs and hoarding. Shifts out of deposits and into base money—gold coins or the Bank's notes—lowered the ratio of money in the hands of the public to base money. Without an offsetting increase in the Bank of England's monetary liabilities, the overall money supply would be forced to contract, with adverse effects on the price level and economic activity. To maintain price stability and adherence to the gold standard, the Bank of England needed to expand the supply of its monetary liabilities to accommodate a run-induced increase in demand.[4] This was Thornton's central message.

A central bank can expand its monetary liabilities in one of two ways: buying government securities or lending to private counterparties. Before late 2008, the Federal Reserve routinely relied on the former to implement interest rate targets. The 19th-century Bank of England routinely relied on the latter, discounting a wide range of credit instruments for private counterparties. Thornton saw that during a panic the Bank needed to expand its monetary liabilities, and he argued that the Bank should manage its note issue to serve monetary stability objectives. Thornton assumed that discounting was the relevant means of controlling the Bank's note issue, though he knew of and approved the Bank discounting (government-issued) Exchequer bills during the panic of 1793. While neither Thornton nor Bagehot used the phrase "lender of last resort," they both took for granted that lending was the predominant operational means

3. Michael Bordo (2014, 132) provides a broader critique, citing actions since the 1970s that "have moved it very far away from Bagehot's strictures and have opened up a Pandora's box of perils." Frederic Mishkin and Eugene White (2014) find precedents for the Fed's recent actions in the actions of central banks of the United States, the United Kingdom, and France from the late 19th century to the end of the 20th century.

4. George Selgin (1988, 627) emphasizes that the fundamental problem was as much a consequence of the legal monopoly on the issue of base money as it was a consequence of fractional reserve banking.

of expanding the monetary base. Expanding holdings of government securities would have expanded the Bank's note issue just as effectively, but in Thornton's day, the Bank's advances to the government were politically and constitutionally charged. Funding the government was the Bank's founding purpose in 1695, but parliamentary control of those advances was critical to the credibility of the government's commitment to repay government debt without debasement. Parliament had explicit authority over the Bank's lending to the government but not over the Bank's private lending, which was a discretionary power under the monopoly banking franchise granted by the Bank's charter. Moreover, in 1825, the government specifically refused to issue Exchequer bills to rescue merchants as it had in 1793, essentially imposing responsibility for crisis lending on the Bank of England. It is easy to understand why Thornton and Bagehot would reflexively equate monetary control with the Bank's discounting.

The Bank of England lending advocated by Thornton and Bagehot had the narrow purpose of staunching monetary instability and maintaining the gold standard in response to shocks to the demand for base money. Such shocks were accommodated virtually automatically under the Fed's interest rate targeting regime up until October 2008, without the need for direct intervention in credit markets. The Federal Reserve relied almost exclusively on buying US Treasury securities when it wanted to expand its monetary liabilities. What little Fed lending took place was routinely sterilized, because otherwise the additional supply of reserves would push the federal funds rate below target. Before October 2008, Fed credit extension thus constituted pure *credit policy*, in Marvin Goodfriend's (1994) terminology—a loan to the private sector offset by the Fed's sale of government securities. (An expansion of the monetary base accomplished by open market purchases of government securities constitutes pure *monetary policy* in his terminology.) For *monetary* stability, the central goal of Thornton's prescriptions, Goodfriend (1994) argued persuasively, as did Milton Friedman (1960, 35–45), that Fed lending is unnecessary since open market purchases of Treasury securities can accomplish the same objective. What Thornton and Bagehot exhorted the Bank of England to do in a crisis was a combination of monetary policy and credit policy. The centrality of monetary expansion to the classic lender-of-last-resort idea suggests that the popular checklist is missing an important item that Thornton and Bagehot took for granted: Central bank crisis lending should be *unsterilized*.[5]

5. A corollary is that if the money supply is not under threat and expansion of the central bank's monetary liabilities is not needed, it is not a true banking crisis but is instead what Anna Schwartz (1986) would call a "pseudo-crisis."

In the years leading up to 2008, therefore, Fed lending was generally divorced from monetary conditions and unrelated to the role of the central bank as lender of last resort, as Thornton and Bagehot would have understood that policy prescription. Beginning in October 2008, the Fed began paying interest on reserves, and its balance sheet became uncoupled from the fractional reserve monetary mechanism that was central to Thornton's account. Fed credit extension has generally been unsterilized but has had virtually no effect on the quantity of money in the hands of the public because the banking system's demand for reserve balances has been satiated.[6] The Fed's lending and asset acquisition since 2008 has thus also been unrelated to the last-resort lending Thornton and Bagehot advocated for the Bank of England.

Evaluating the full gamut of rationales that have been put forth for 21st-century central bank credit extension is beyond the scope of this study. The focus here is on just one of them: the appeal of the idea of a long-established role of the central bank as lender of last resort. To make such an appeal is to portray recent credit market interventions by the central bank as time-honored policies, providing a sense of continuity with well-tested past practices. The case for recent interventions would indeed be bolstered if such interventions and the settings in which they occurred could be shown to bear a strong resemblance to interventions that made economic sense long ago. However, a careful reading of Henry Thornton and the economic environment facing the Bank of England at the time suggests that this particular rationale is unpersuasive. What Thornton and Bagehot envisioned is perhaps more precisely described as a monopoly monetary instrument supplier of last resort.

The first section briefly reviews the literature on the idea of the central bank as a lender of last resort, and the second provides some background on the founding of the Bank of England and late 18th-century British banking. Thornton's treatment of the lender-of-last-resort idea is then reviewed in section 3 of this study, and Bagehot's in section 4. Their classical analysis is compared to modern central bank practice in section 5. The interaction between money and credit—often conflated both then and now—is discussed in section 6. The measures taken by the Bank of England, the British government, and Parliament to resolve the panics of 1793 and 1825 are discussed in sections 7 and 8, respectively. The collective response in 1793 resembles the "credit accord" advocated by Marvin Goodfriend and others. In 1825, the government instead

6. See Ennis (2018) for a model in which monetary conditions are unchanged over a broad range of reserves supply in the presence of interest on reserves. See also Ennis and Sablik (2019).

imposed responsibility for credit allocation on the Bank of England. Sections 9 and 10 discuss the Bank's incentives as a private, for-profit intermediary and how those incentives might have affected the Bank's stance toward crisis lending. The divergence between the "national interest" and the Bank's interest helps explain why Thornton and Bagehot felt the need to urge the Bank to lend when it was otherwise reluctant to do so. Factors inhibiting the Bank of England's open market operations are discussed in section 11. A final section briefly discusses what light this history sheds on the evolution of central banking over the past two centuries.

1. Lender-of-Last-Resort Ideas over the Centuries

The economic literature on the role of central banks as lender of last resort is vast. It includes many recent contributions and copious references to other works on doctrinal history (see Goodhart and Illing 2002a; Bignon et al. 2012; Flandreau and Ugolini 2013; Bordo 2014; Grossman and Rockoff 2016; Calomiris et al. 2016). A more recent academic literature examines the role of central bank lending in general equilibrium models. See Huberto Ennis (2016) for a thorough survey and critique. Much of the doctrinal literature describes the evolution of lender-of-last-resort actions, with particular attention to the timing of the process by which the Bank of England came to accept its responsibility to serve in that role over the course of the 19th century; various authors propose various dates (Capie 2002; D. O'Brien 2003; Bignon et al. 2012; Calomiris et al. 2016). I will have little to say about that process except to note that in the crisis of 1793, the government of William Pitt took on the responsibility for intervening in credit markets, as London merchants, including Bank of England directors, had requested. The Bank cooperated by monetizing the bills issued to finance the Exchequer's lending. In 1825, in contrast, Lord Liverpool's government imposed the burden of credit policy on the Bank, thus tying the monetary response to public-sector credit extension. That precedent stood, and what the Bank of England ultimately "accepted" by way of lender-of-last-resort responsibility was a bundle of monetary stability and credit allocation roles that were, in principle and in practice, quite separable.

The phrase "lender of last resort" has been defined in various ways since what appears to be its first use by Ralph Hawtrey ([1932] 1962, 116–17) in the 1930s (Haubrich 2013). Several contemporary writers identify the lender-of-last-resort role as supplying additional base money in response to increased demand in a panic, consistent with Thornton and Bagehot's views (Humphrey 1975,

1989; Schwartz 1986; Goodfriend and King 1988; Bordo 1990, 2014; Kaufman 1991; Capie 2002; Lacker 2014). These authors exclude sterilized lending and emphasize that open market purchases of government securities can achieve the monetary objective of lender-of-last-resort operations. In fact, some go as far as to include such purchases in the scope of their definition of lender-of-last-resort operations, describing them as supplying liquidity to the market, as opposed to channeling funds to an individual firm in distress. This definition is consistent with the views of Thornton and Bagehot, both of whom allowed for loans against or open market purchases of government securities in their prescriptions. In contrast to this historically faithful monetary definition, some writers define last-resort lending simply as central bank credit extension in a crisis, whether sterilized or not, and tend to view it as mitigating banking or credit market problems (Mishkin 1997; Goodhart 1999; Goodhart and Illing 2002b; Bernanke 2013a). This looser definition tends to distinguish lender-of-last-resort actions from those traditionally identified solely with monetary policy, such as open market operations. Charles Goodhart (1999, 344), for example, argues for excluding some open market purchases from the lender-of-last-resort umbrella.[7] As this study will show, Henry Thornton's late 18th-century recommendations for the Bank of England's crisis lending accord with the narrower monetary understanding of the lender-of-last-resort role. Thornton saw the primary objective of expanded Bank lending as increasing the supply of Bank notes in response to a panic-induced surge in demand. Moreover, Thornton explicitly denied that relieving credit market problems per se, as opposed to relieving a scarcity of payment instruments, should be the objective.[8]

The contrast between classical thought on last-resort lending and the more expansive recent usage points to important changes in central bank governance over the past two centuries. Founded in 1694, just a few years after the Glorious Revolution of 1688, the Bank of England was a for-profit banking franchise with special legal privileges attached to a government funding mechanism. The Bank's loans to the government were closely constrained by Parliament, an arrangement deliberately designed to control borrowing by the Crown and credibly commit to repayment without debasement (Hicks 1969, 93–95; North and Weingast 1989, 808–15; Bordo and White 1991; Sargent and Velde 1995, 479–80). Given the political

7. Charles Goodhart and Gerhard Illing (2002b, 10–14) describe the narrow approach as the "money view" and the loose approach as the "credit view." Their terminology seems to connect definitions with policy prescriptions.
8. Many of the general equilibrium models of discount window lending surveyed by Huberto Ennis (2016) are unclear on the distinction between central bank lending and open market operations.

sensitivity of the Bank's advances to the Crown and the necessity of explicit parliamentary permission, it was natural for Thornton and Bagehot to equate the Bank's management of its note issue with the Bank's lending. Moreover, while the Bank's pecuniary incentives aligned well with the public interest in monetary stability in the case of external balance-of-payments shocks, the Bank's incentives diverged from the public interest in the case of runs on the fractional reserve banking system that threatened to induce monetary contraction. Bagehot's impassioned rhetoric was aimed at just such cases when the Bank's aversion to credit risk conflicted with the need to accommodate the surging demand for money.

In contrast, open market purchases of government securities have been the conventional method of controlling the Fed's monetary liabilities from the middle of the 20th century through late 2008. The Fed's interest rate setting procedures meant that shifts in money demand of the type that concerned Thornton and Bagehot were accommodated virtually automatically via open market purchases of Treasury securities (Goodfriend and King 1988, 17). For monetary stability, Fed lending authority became redundant, a vestigial appendage (Lacker 2014, 2019). Although the Federal Reserve Banks are nominally profit-making corporations, legislative reorganization during the Great Depression concentrated power in the Board of Governors and oriented the Fed toward the public interest, as mediated by the political system. When financial market uncertainty looms large, sterilized lending can offer protection against being blamed, fairly or not, for financial turmoil. In that context, appealing to the mystique of a classic central banking role of lender of last resort can have rhetorical appeal. Successive interventions have expanded the federal safety net over time, however, and have corroded private-sector risk management incentives and exacerbating financial fragility (Goodfriend and Lacker 1999).

2. Eighteenth-Century British Banking

When the Bank of England was founded in 1694, both sovereign funding and private lending were core functions.[9] The Crown was running out of credible mechanisms for financing war with France. After the control of public finance was transferred to Parliament in 1693, the Bank of England was chartered as

9. See William Roberds and François Velde (2016, 18–19) for an overview of pre-Napoleonic public banks in Europe. They describe the Bank of England's model as the basis for the evolution of central bank design following the "extinction event" of 1815 that ended many public banks. They credit the Bank of England with a "celebrated and decisive engineering breakthrough" provided "through its winning formula of restrained note issue and adroit management of government debt."

a way to provide longer-term funding (Richards 1934; Clapham 1944, I: 13–20; Kynaston 2017, 1–6; P. K. O'Brien and Palma 2023). Wealthy investors subscribed for £1.2 million worth of shares, which was advanced to the government as a perpetual loan returning 8 percent interest and a £4,000 annual management fee; investors obtained ownership of a joint-stock company that possessed the right to engage in general banking business, including lending, taking deposits, issuing notes, dealing in bills of exchange, and buying and selling gold and silver. In 1697, the Bank was pressed to absorb a large quantity of government tallies and notes at par, even though they were trading at a discount (Jenkinson 1925; Richards 1965, 58–60).[10]

In the meantime, Parliament had attempted to establish a similar funding mechanism, the Land Bank, which ultimately failed (Rubini 1970; Murphy 2013, 192–93). In exchange for extending more funding to the government, Parliament agreed to extend the Bank's charter and pledged that no other banking company would be established (Clapham 1944, I: 47).[11] Subsequent charter renewals reaffirmed and strengthened the Bank's privileges, most notably in 1708 when Parliament banned the issue of demandable notes by corporations of more than six partners, thereby granting an effective monopoly on joint-stock banking that was to last until 1833 (Clapham 1944, II: 130).[12]

The fact that the Bank of England held both sovereign debt and private liabilities was essential to the design of the Bank. The government needed a credible means of committing to repaying its debts. Because the Bank managed accounts for the government, collecting payments directly from revenue sources earmarked by Parliament for the repayment of the debt, future disbursements could be withheld in the case of default.[13] This mechanism kept the government

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10. Tallies were short wooden shafts (often hazelwood) that were marked with notches of various depths to denote numerical values and then split lengthwise, with each party keeping one part for verification. Tallies have a long history; in England, they were created as receipts for the payments to the government and acted as a form of short-term borrowing (Moore 2013).
11. In addition, "forgery of the Bank's notes was to be punished by death, the penalty for clipping or coining the King's money" (Clapham 1944, I: 50).
12. Parliament made it unlawful for "any body politic or corporation whatsoever erected or to be erected other than the said Governor and Company of the Bank of England, or for other persons whatsoever united or to be united in covenant or partnership, exceeding six persons, in that part of Great Britain called England, to borrow, owe, or take up any sum or sums of money on their bills or notes, payable at demand, or at any time less than six months from the borrowing thereof" (Bisschop 1910, 82–83; see also Feavearyear 1963, 167; Broz and Grossman 2004, 51; Clapham 1944, I: 65).
13. "Since loans to the Crown went through the Bank, 'it must have instantly stopped payment if it had ceased to receive the interest on the sum which it had advanced to the government.'" North and Weingast (1989, 821), quoting Lord Macauley (1914, V: 2438). See Philippovich (1911) for details on the Bank's fiscal agent services to the Crown.

from playing lenders against each other, defaulting to one while borrowing from another, which was common in 17th-century Europe (Hicks 1969, 93–95; North and Weingast 1989, 808–15; Sargent and Velde 1995, 479–80).

The creation of the Bank also reduced the government's borrowing costs. The grant of monopoly banking privileges created a stream of rents that benefited shareholders but were bundled together with the obligation to lend to the government. Some of those rents were channeled back to the government through lower interest rates, bonuses to Exchequer officials, and periodic concessionary loans and gifts to the government on the occasion of charter renewal (Broz and Grossman 2004; Calomiris and Haber 2015, 89–93). The founding of the Bank of England can be seen as channeling government borrowing through a specially chartered financial intermediary, granting it monopoly private banking rights, and then extracting some of the resulting rents.

The Bank of England's lending to the private sector was thus a component of a banking monopoly that was integral to the new mechanism of public finance. Also integral was a legal provision prohibiting the Bank from lending to the government without an authorizing vote of Parliament, inhibiting the government's ability to pressure the Bank to circumvent Parliament's control of government debt issuance.[14] That constraint was essential to the credibility of government finance and to limiting the financing of government spending via circulating notes (Thornton [1802] 1939, 107–8). The resulting risk of overissue and debasement had been demonstrated by other European nations as well as by Britain in the past. As the expiration of the Bank's charter approached, the government typically pressed the Bank to agree to additional extensions of credit. Negotiations ensued, and the expanded debt was then incorporated into Parliament's legislation renewing the charter. The Bank offered credit extension to the government to preserve and extend its monopoly privileges. Expanding the note issue by taking on additional government debt in a crisis without explicit parliamentary permission would arguably violate the terms of the Bank's charter, give away the Bank's political bargaining power, and undermine the authority of Parliament to regulate government borrowing. Acquiring government obligations was a constitutionally sensitive act; private-sector lending was a customary component of the private banking charter.

The Bank of England stood at the center of the British banking system as it evolved over the 18th century. The Bank accepted deposits, provided lines of

14. Bank of England Act 1964, 5 & 6 Will. & Mar. c. 20, Section 25. This provision was repealed by the Bank of England Act 1946 (Bank of England 2015, 6). The 1708 charter renewal (7 Anne, c. 7) added that no Exchequer bills could be issued without the consent of the Bank.

credit, and discounted bills of exchange and promissory notes for wealthy individuals and firms (Cameron 1967, 20–22). An array of private bankers in London also accepted deposits and dealt in bills of exchange but had largely withdrawn from issuing circulating bank notes. As reserves, they either held Bank of England notes or kept an account at the Bank and generally settled interbank claims using Bank notes (Clapham 1944, I: 222; Feavearyear 1963, 166).[15] In the countryside, a variety of private bills and notes were circulated as means of payment. Henry Thornton, writing in 1802, provides a vivid account of country monetary arrangements and how they were connected to London:

> In every town, and in many villages, there existed, antecedently to the creation of what were afterwards termed banks, some trader, manufacturer, or shopkeeper, who acted, in many respects, as a banker to the neighbourhood. The shopkeeper, for example, being in the habit of drawing bills on London, and of remitting bills thither, for the purposes of his own trade, and receiving also much money at his shop, would occasionally give gold to his customers, taking in return their bills on the metropolis, which were mixed with his other bills, and sent to his London correspondent. (Thornton [1802] 1939, 169)

Country banks emerged in growing numbers alongside industrialization in the late 18th century, combining deposit taking with the provision of means of payment and a channel to local investment opportunities (Cameron 1967). As Leslie Sedden Pressnell describes it:

> Early bankers were drawn largely from industries and professions the activities of which expanded in the Industrial Revolution, providing needs—and opportunities—sufficiently great to throw off full-time bankers. Complete specialization was, however, delayed by the prohibition of joint-stock banking; early banking, in consequence, was commonly combined with other business pursuits, from the extension of which it had originally developed, and this greatly colored the policies of the first bankers and the subsequent tradition of English banking. (Pressnell 1956, 12)

15. "The larger London payments are effected exclusively through the paper of the Bank of England; for the superiority of its credit is such, that, by common agreement among the bankers, whose practice, in this respect, almost invariably guides that of other persons, no note of a private house will pass in payment as a paper circulation in London" (Thornton [1802] 1939, 105).

Because of the legislative limit on banking partnerships, country banks had very few branches and were quite numerous by the end of the century (Pressnell 1956, 126–27). Almost every country bank "was practically compelled to keep an account with a London bank" that would redeem notes and bills of the country bank on its behalf and execute orders to purchase securities (Feavearyear 1963, 166). London banks, in turn, either held Bank of England notes as their reserve or kept an account at the Bank and settled claims among themselves through the clearinghouse.[16]

An array of further legal constraints shaped Britain's late 18th-century monetary system:

- While the monetary standard was nominally bimetallic, with the Mint buying bullion and providing coin, Britain gradually moved toward a gold standard over the course of the 18th century through "benign neglect" of the subsidiary (silver and copper) coinage (Sargent and Velde 2002, 261–305).
- An Act of Parliament (1696) "forbade the export of bullion unless it were stamped at Goldsmith's Hall and an oath taken that it was not the produce of English coin" (Feavearyear 1963, 4). While evasion was not unheard of and was at times common, swearing a false oath apparently not being an overwhelming obstacle, the export prohibition did seem to impose an impediment to the integration with continental bullion markets (Thornton [1802] 1939, 146; Great Britain [1812] 1979).
- Banks, including the Bank of England, were required to redeem their notes for gold at par, apart from the Restriction period from 1797 to 1821 (Pressnell 1956, 142; Fetter 1965, 6, 35).
- Parliament forbade the issue of banknotes in England for less than £1 beginning in 1775 and less than £5 beginning in 1777 (Clapham 1944, I: 162).
- Only gold and silver coins were legal tender until the Gold Coin Acts 1811 and 1812 made Bank of England notes de facto legal tender (Fetter 1965, 59).
- Usury laws placed an upper limit on borrowing rates, which was lowered to 5 percent in 1713; the final repeal was not until 1854 (Rockoff 2009, 290).

16. For a description of the clearinghouse, see Thornton ([1802] 1939, 101). For accounts of the correspondent arrangements between country and London banks, see Clapham (1944, I: 157–72), Pressnell (1956, 75–125), and Feavearyear (1963, 158–68).

3. Thornton's Advice to the Bank of England

The idea that the Bank of England should be what later came to be called "the lender of last resort" emerged at the end of the 18th century.[17] The outbreak of war with France in 1793 led to crises in that year and in 1797. The 1797 crisis led Parliament to direct the Bank to cease paying out gold for notes, beginning a period known as the Restriction, in which England's paper currency was effectively severed from gold. This change sparked an outpouring of writings and debate about monetary issues, among which the 1802 book by Henry Thornton, *An Enquiry in the Nature and Effects of the Paper Credit of Great Britain,* stands out.[18] It is widely regarded as the preeminent analysis of central bank policy of the 19th century.[19] While it was Sir Francis Baring (1797) who used the French phrase *dernier resort* in reference to the Bank of England, the ideas that later came to be identified with the phrase "lender of last resort" were first coherently articulated by Thornton, though he did not use that phrase. Friedrich A. Hayek (1939, 57) notes that "among those of his contemporaries who took an interest in these matters there existed little doubt that the new body of thought was mainly his creation." While Baring's publication was earlier, the evidence Thornton gave following the 1797 suspension clearly explains the thesis (D. O'Brien 2003, 3).[20]

Monetary control under a fractional reserve banking system was at the core of Thornton's analysis (Humphrey 1975, 1989; Hetzel 1987; Bordo 1990, 19–21; Bordo 2014, 127; Meltzer 2003, 26–31). In such systems, *base money* (also known as *high-powered* or *outside money)*, such as gold or central bank notes, circulates as a means of payment along with *inside money*, such as bank notes or deposits, which are partially backed by holdings of base money. In 18th-century Britain,

17. As previously mentioned, the phrase "lender of last resort" appears to originate with Hawtrey ([1932] 1962, 116–17), who clearly identifies it with the central bank's responsibility for currency supply: "The Central Bank is the lender of last resort. That is the true source of its responsibility for the currency." See Haubrich (2013) and Grossman and Rockoff (2016, 255). Before Hawtrey, the shorter phrase "last resort" appears often in discussions of central bank lending—for example, in the debate about the founding of the Federal Reserve.
18. I will reference the edition first published in 1939 by George Allen & Unwin.
19. Allan Meltzer (2003, 19) notes that the discussion of central banking "reached a high point" at the beginning of the 19th century, and "[t]hereafter, the level of the discussion drifted lower." John Hicks (1967, 186–87) wrote, "Thornton is in the front rank of monetary economists; he is the peer of those that we have seen in our own time." Hicks (1967, 187) quotes Dennis Robertson as saying "Oh, Thornton, he knew everything." See also Humphrey (1975), Hetzel (1987), and Peake (1995, 284) and the latter's many citations.
20. Further exposition of "the new body of thought" was provided by Francis Horner in an unsigned review of Thornton's book in *The Edinburgh Review* (Horner 1802) and by the 1810 report to Parliament of the Bullion Committee, written jointly by Horner, Thornton, and William Huskisson (Great Britain [1812] 1979).

monetary instruments included gold coins, small-denomination coins (generally underweight), notes issued by and deposits at the Bank of England, and the deposit and note liabilities of private banks. The latter were backed only partially by holdings of gold and Bank notes. A public shift out of bank liabilities and into gold or Bank notes, as in a bank run, contracted the money multiplier—the ratio of money in circulation to base money (coin plus Bank notes and deposits).

Moreover, when such shifts occurred rapidly during a crisis, they were typically accompanied by the hoarding of gold and Bank notes, thereby reducing the velocity of circulation and exacerbating the scarcity of payment instruments. Unless the Bank engineered an increase in its note issue to offset this "internal drain," the resulting monetary contraction would disrupt economic activity and trade. Lending to the private sector by the Bank of England would increase the Bank's note issue and arrest the monetary contraction.

For Thornton, the purpose of the Bank's lending in response to an internal drain was the preservation of the stock of circulating money. His concern throughout is the management of the supply of Bank notes, not the extension of credit per se. His account of the sequence of events leading up to the suspension in 1797 spells out the connection between the country bank withdrawals and pressure on the Bank's reserves:

> [F]ear of an invasion took place, and it led to the sudden failure of some country banks in the north of England. . . . A great demand on the Bank of England for guineas was thus created. . . . In London, it is observable that much distress was beginning to arise, which was in its nature somewhat different from that in the country. In London, confidence in the Bank of England being high, and its notes maintaining their accustomed credit, its guineas were little called for with a view to the mere object of London payments. The guineas applied for by persons in London, [were], generally speaking, on the account of people in the country. The distress arising in London, like that which took place in 1793, was *a distress for notes of the Bank of England*. So great was the demand for notes, that the interest of money, for a few days before the suspension of the payments of the bank, may be estimated (by calculating the price of exchequer bills, the best test that can be referred to, as well as by comparing the money price of stocks with their time price) to have been about sixteen or seventeen per cent. per ann." (Thornton [1802] 1939, 112–13; emphasis added)

Fear of losses on some country bank notes led to redemptions, which banks were legally required to meet at par or close. They looked, in turn, to their London correspondents for guineas. London banks had little use for guineas to settle among themselves but instead settled in Bank of England notes, which also could be presented at the Bank for guineas to send to country bank correspondents. A surge in withdrawals from country banks thus drove up the demand for notes, which drove market interest rates to exceptional heights. The "distress" in London was a rising demand for Bank of England notes, evidenced by a fall in price (rise in yield) of the credit instruments offered to obtain them.

Country bank notes were not the only paper affected in a crisis. An account of testimony by Gilbert Innes, director of the Royal Bank of Scotland, about the panic of 1793 described how the scarcity of notes impeded the sale of goods on credit:

> This prospect of distress to the manufacturers in [Innes's] opinion arises, not so much from a failure of the usual market for goods, as from the difficulty in discounting in London and in Scotland the long dated bills received for the goods. Great quantities of manufactured goods belonging to manufacturers in Scotland are now in London, for which, when sold, bills are granted for a small part at three months, and the remainder from six to fourteen months, the greatest part of which goods have been formerly sold for long dated bills, but are not so now from the difficulty of obtaining discounts; and he has heard manufacturers say they were willing to sell their goods with a considerable loss to obtain relief, by sales, for ready money. (Great Britain 1793a, 14–15)[21]

After sending goods to London for sale, manufacturers would exchange them for short- and long-dated bills, extending trade credit to buyers. During the panic, they were no longer doing so, owing to the difficulty of selling those bills for "ready money." The scarcity of guineas and banknotes was driving down the value of the bills and goods that were traded for them.

Thornton argued that the Bank should lend for the purpose of augmenting the stock of circulating notes, even if that exhausted its gold.

21. Statement of Gilbert Innes, director of the Royal Bank of Scotland, to the Select Committee appointed to take into consideration the present state of Commercial Credit, and the report their Opinion and Observations to the House, a committee of Parliament.

> [T]he holder of a note of 1000*l.* [i.e., pounds] . . . carries it to the Bank and demands 1000*l.* in gold. The bank gives the gold; which gold, let it be remarked, either goes abroad to pay for an unfavourable balance of trade, or, as we are now rather supposing, fills a void in the circulation of the country, occasioned by the withdrawing of country bank notes in consequence of alarm, or serves as an addition to the fund of country banks, or forms a hoard in the hands of individuals . . . . The bank, therefore, having paid away this 1000*l.* in gold, and having received for it their own note for 1000*l.* must now re-issue this note, if they are resolved to maintain the amount of their paper circulation. How, then, is the bank to issue it? The only means which the bank, on its part, is able to take for the extension of its paper circulation, is to enlarge its loans. (Thornton [1802] 1939, 125)

In response to an internal drain of gold, the Bank needed to maintain or increase the amount of its notes in circulation to offset the decline in the money multiplier—lending was the means of doing so, not an end in itself. The Bank could accomplish the same objective by acquiring more government securities—open market operations in modern terminology—but Thornton writes that lending is how it would do so. This view reflects the special constitutional status of the Bank's advances to the government, as will be discussed subsequently.

Thornton's view that the role of the Bank of England in a crisis was to supply base money is restated with clarity in the review of Thornton's book by Francis Horner (1802). When the public confidence is shaken, Horner notes:

> it has been particularly found, that the notes of country banks, which chiefly circulate among consumers and petty dealers, have fallen into distrust with that large portion of the people. If one bank should fail, a run upon all those in the neighborhood immediately takes place, and diffuses general distress. Such of the country bankers, as are most prudent, adopt a preventive caution, by limiting of their own accord, the issue of their notes; and all of them are forced to enlarge that fund of cash, with which they may be prepared to answer demands. In consequence of these operations, an additional quantity of gold and of Bank of England notes must be carried down from London into the country, both to supply that void in the channel of circulation from which the discredited country notes have been thrown out, and to form that

> additional reserve which the bankers must keep in their coffers. (Horner 1802, 191)

At such times, London traders will also "keep a larger supply of Bank of England notes than they find necessary in ordinary times."

> By these multiplied hoards, as well as by the quantity of cash sent into the country, the circulating money of the metropolis must suffer a very great diminution. But it was previously no more than sufficient to effect the necessary payments; and on the punctual discharge of these, the whole commercial credit of the kingdom depends. Unless the Bank of England, therefore, which is the source of circulating medium, shall, in these circumstances, consent to enlarge its issue of paper, a general subversion and ruin of that credit may take place; but if it adopts such a measure seasonably, and in proportion which the new demands of the circulation require, the mischief may cease after a slight and temporary inconvenience. (Horner 1802, 192)

Elsewhere, discussing the need for the Bank of England to avoid overissue, Horner emphasizes that note supply objectives should govern the Bank's lending, not vice versa:

> As its notes are issued in loans to the merchants, it can only limit the extent of that issue, by restricting the amount of the loans. Hence it appears, that the Bank ought to regulate the total amount of its loans, with a view to the quantity of circulating medium, independent altogether of the solvency and opulence of those who wish to become borrowers, and of the character of the bills that are offered for discount. (Horner 1802, 195)

Thornton and Horner thus argue against the idea that the characteristics of borrowers or the collateral they offer should influence the Bank's note supply and, thus, its lending.

In a frequently cited passage near the end of his book, Thornton sums up his instruction to manage the note supply in line with fluctuations in money demand and the balance-of-payments pressures:

> To limit the total amount of paper issued, and to resort for this purpose, whenever the temptation to borrow is strong, to some effectual principle of restriction; in no case, however, materially to diminish the sum in circulation, but to let it vibrate only

> within certain limits; to afford a slow and cautious extension of it, as the general trade of the kingdom enlarges itself; to allow of some special, though temporary, encrease in the event of any extraordinary alarm or difficulty, as the best means of preventing a great demand at home for guineas; and to lean to the side of diminution, in the case of gold going abroad, and of the general exchanges continuing long unfavourable; this seems to be the true policy of the directors of an institution circumstanced like that of the Bank of England. To suffer either the solicitations of merchants, or the wishes of government, to determine the measure of the bank issues, is unquestionably to adopt a very false principle of conduct. (Thornton [1802] 1939, 259)

Thornton's prescription directs the Bank of England to subordinate its lending policy to the control of the monetary base that it uniquely is authorized to supply. In crises such as 1793 or 1797, the Bank of England needed to prevent monetary contraction by providing sufficient additional circulating medium to effect the "punctual discharge" of "necessary payments."[22] Lending was the means of doing so.

The relationship between Bank lending and monetary policy is featured prominently in the famous Bullion Committee Report (Great Britain [1812] 1979), which Parliament commissioned in 1810 following the inflation of the Restriction period. The authors of the report—Thornton, Horner, and William Huskisson—argued that the absence of convertibility implied that the Bank's note issue was determining the price level and, with it, the pound price of bullion. The Bank and its defenders denied that excessive note issues were possible as long as they restricted their lending to meet commercial demands secured by "bills of undoubted solidity."[23] The report's authors spell out why this idea is wrong:

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22. Thornton ventured a gentle critique of the Bank's policies in those crises: "I venture, however, with deference, to express a suspicion that the bank may have, in some measure, aggravated, perhaps, rather than lessened, the demand upon itself for guineas through the suppression of too many notes at the time preceding the suspension of its cash payments; and I will hazard an opinion, that it might also, with propriety, have somewhat extended the temporary issue of its paper in the year 1793, when that alarm, arising from the failure of country banks, which has been already spoken of, took place. It is clear, at least, that it did not, in the more recent instance, succeed by the diminution of its notes in curing the evil which it thus aimed to remedy" (Thornton [1802] 1939, 127–28). Henry Thornton's deference may reflect sympathy owing to the role of his brother Samuel as a Bank of England director.

23. See testimonies of John Louis Greffulhe (Great Britain [1812] 1979, cccxx-cccxxxv) and James Whitmore, governor of the Bank of England (Great Britain [1812] 1979, cccxlvii-cccliii).

"That this doctrine is a very fallacious one, Your Committee cannot entertain a doubt. The fallacy upon which it is founded lies in not distinguishing between an advance of capital to Merchants and an additional supply of currency to the general mass of circulating medium" (Great Britain [1812] 1979, ccxliv). This fallacy was to live on in the form of the "commercial loan theory," or "real bills doctrine" as Lloyd W. Mints (1945) tagged it—the idea that "money can never be excessive or deficient when issued in the form of loans against short-term, self-liquidating commercial bills arising from real transactions in goods and services" (Humphrey and Timberlake 2019, 7). The real bills doctrine, with its emphasis on the qualitative features of credit extension by the banking system and the central bank, was fundamental to the founding design and early operations of the Federal Reserve System, including the disaster of the 1930s (Mints 1945; Humphrey 1982; Hetzel 2014, 2022; Wicker 2015; Humphrey and Timberlake 2019).

4. Bagehot

Seventy-one years after Thornton's tract, Walter Bagehot's (1873) *Lombard Street* provided what would become the most widely cited exposition of the classic lender-of-last-resort doctrine. Bagehot restates many of Thornton's insights, though without mentioning Thornton.[24] He notes the vulnerability of a fractional reserve banking system to widespread withdrawals and points out that the Bank of England holds the vast bulk of the country's gold reserve and, as a consequence, has a special responsibility in a crisis (Bagehot, 1873, 8, 31). Bagehot's (1873, 18) core message is that the Bank's leadership ought to forthrightly accept the responsibility to act in the public interest in a crisis rather than act as just another self-interested private bank, as some Bank directors asserted. This view led to Bagehot's famous Dictum: In the face of a banking panic, the Bank should lend freely at a high interest rate, accommodating any solvent borrower offering good collateral (as valued at precrisis prices) (Humphrey 1975; Bordo 1990). Moreover, the Bank should announce that policy in advance and hold a larger gold reserve than would a purely private bank.

Bagehot agreed with Thornton that the central purpose of the Bank of England's crisis lending was to increase the supply of the Bank's notes: "The *amount* of the advance is the main consideration for the Bank of England, and not the nature of the security on which advance is made, always assuming the security to be good" (Bagehot 1873, 101; emphasis original). Because the expanded note issue is

24. David Laidler (2002) notes several differences between the views of Thornton and Bagehot.

the objective, the Bank's lending should be relatively indiscriminate within broad boundaries. Bagehot went so far as to suggest advances on railway debenture stock. But the Bank need not take on the risk of insolvent borrowers: "No advances indeed need be made by which the Bank will ultimately lose" (Bagehot 1873, 97).

The panic of 1825, 10 years after Thornton's death, features prominently in what might be the most frequently quoted passage in *Lombard Street*:

> A panic, in a word, is a species of neuralgia, and according to the rules of science you must not starve it.[25] The holders of the cash reserve [i.e, gold] must be ready not only to keep it for their own liabilities, but to advance it most freely for the liabilities of others. They must lend to merchants, to minor bankers, to "this man and that man," whenever the security is good. In wild periods of alarm, one failure makes many, and the best way to prevent the derivative failures is to arrest the primary failure which causes them. The way in which the panic of 1825 was stopped by advancing money has been described in so broad and graphic a way that the passage has become classical. "We lent it," said Mr. Harman, on behalf of the Bank of England, "by every possible means and in modes we had never adopted before; we took in stock on security, we purchased Exchequer bills, we made advances on Exchequer bills, we not only discounted outright, but we made advances on the deposit of bills of exchange to an immense amount, in short, by every possible means consistent with the safety of the Bank, and we were not on some occasions over-nice. Seeing the dreadful state in which the public were, we rendered every assistance in our power." After a day or two of this treatment, the entire panic subsided, and the "City" was quite calm. (Bagehot 1873, 25)

This passage is often cited as support for central bank lending to an expansive range of counterparties, but that interpretation seems off base. The

25. The meaning of the term *neuralgia* (pain arising in the distribution of a nerve or nerves) has evolved since the early 19th century (Alam and Merskey 1994). Originally regarded as pain in peripheral nerves, the term expanded in the mid-19th century to include migraines, "nervous headaches," and "indeterminate pains" such as angina pectoris (Alam and Merskey 1994, 433, 452–53). In the late 19th century, the term was used for "practically any pain, in the body, which could not be linked to a definite cause" (Alam and Merskey 1994, 433), but the meaning of neuralgia has since narrowed. It is not clear which "rules of science" in 1873 said that one must not starve nerve pain, since treatment has typically focused on pain management (Collier 2018). Bagehot may have been referring to the presumed rules of science pertaining to financial crises, in which case the analogy to neuralgia seems superfluous.

quotation is taken from the testimony of Jeremiah Harman, director of the Bank of England from 1794 to 1827, before an 1832 committee of Parliament considering the renewal of the Bank of England's charter, where it appears in the midst of a long interrogation regarding the 1825 panic (Great Britain Parliament House of Commons Committee of Secrecy on Bank of England 1832, 150–66). The questions posed to Harman are focused entirely on the Bank's gold reserve and note circulation. Aside from this quote from Harman, his testimony makes no mention of credit markets. The notably diverse and indiscriminate ways in which the Bank was said to lend in December 1825 were a measure of how desperate the Bank was to get its notes and gold into circulation, not how broad a range of counterparties it wanted to assist. They indicate that expanding the supply of money was the Bank's objective, not lending per se. Note Harman's mention of making advances on Exchequer bills, another sign that the credit market per se was not the objective. Bagehot's point was that the Bank must be ready to put its gold reserve into public circulation and not hold on to it for fear of note redemption. One page later, Bagehot emphasizes that crisis lending was not simply about releasing gold into circulation:

> An increase of loans at such times is often an increase of the liabilities of the bank, not a diminution of its reserve. Just so before 1844, an issue of notes, as in 1825, to quell a panic entirely internal did not diminish the bullion reserve. The notes went out, but they did not return. They were issued as loans to the public, but the public wanted no more; they never presented them for payment; they never asked that sovereigns should be given for them. (Bagehot 1873, 26–27)

Thus, for Bagehot, as for Thornton, it was circulating gold and Bank notes that mattered—what we now call the *monetary base*.

5. How Does Classical Thought Compare to Modern Central Banking?

A fractional reserve banking system with a monopoly provider of base money, the foundation of Thornton's banking panic narrative and policy recommendation, aligns well with 20th-century accounts of banking and monetary instability. In *A Monetary History of the United States* (1963, 50–53, 790–92), Milton Friedman and Anna Schwartz emphasize the public's shift out of deposits into currency as a consequence of bank weakness and failures (Capie 2002, 301–2; Grossman

and Rockoff 2016, 256–57). Thornton's description fits with the definition of a financial crisis given by Schwartz:

> A financial crisis is fueled by fears that means of payment will be unobtainable at any price and, in a fractional reserve banking system, leads to a scramble for high-powered money. It is precipitated by actions of the public that suddenly squeeze the reserves of the banking system. In a futile attempt to restore reserves, the banks may call loans, refuse to roll over existing loans, or resort to selling assets. (Schwartz 1986, 11)

Such shifts drive up the demand for the monetary liabilities of the central bank, and price stability necessitates accommodating such shifts by increasing the supply of base money. The Federal Reserve was founded as a mechanism for doing so in a manner that improved on the institutional arrangements of the National Bank Era, 1863–1914 (Mints 1945, 223–56; Meltzer 2003, 68–73; Lacker 2013; Wicker 2015).

Modern theoretical models of monetary economies also align with Thornton's account (as well as with the Friedman and Schwartz narrative). For example, Bruce Champ, Bruce Smith, and Stephen Williamson (1996) construct a general equilibrium model in which banks hold reserves, make loans, and issue circulating notes that coexist with central bank currency. Their focus is the contrast between the US and Canadian banking systems in the late 19th century. Private bank note issues were restricted in the United States, which was prone to banking panics, but were unrestricted in Canada, which was not. Champ et al. (1996, 847) note that, in their model, a central bank can overcome the problem posed by limited private note issues with an appropriately responsive management of the money supply. In a separate paper, Williamson (2004b, 873) presents a model of privately issued banknotes in which money issued by a central bank is essential for settlement and optimal money growth "accommodates fluctuations in the quantity of money needed in clearing and settlement." A later paper by Williamson (2012) describes how central bank open market purchases can mitigate financial crises.

Britain's de facto gold standard was also relevant to Thornton's world since banknotes were convertible at par into gold coins. Britain had drifted away from a formally bimetallic standard in the 18th century through the "benign neglect" of small denomination silver coins and was on the cusp of fully implementing the gold standard when Thornton wrote.[26] Angela Redish (1990, 2000) describes in

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26. Selgin (2008) describes privately minted token coins in late 18th-century Britain.

detail how the adoption of a gold standard with token (overvalued) silver coins in the early 19th century depended on the introduction of steam-driven stamping presses to combat counterfeiting and on a supportive Bank of England policy of accepting silver coins at par. Thomas Sargent and François Velde (2002) describe how Western European economies grappled with the recurring scarcity of small changes in the lead-up to the adoption of the "standard formula" that Redish describes. They present a model of bimetallic monetary systems that can produce a "shortage" of small coins (Sargent and Velde, 2002, 337–72). One might expect the price system to adjust to alleviate any shortage of money,[27] but mint policies fix a relative price of gold and silver that can differ from the world relative price. A shortage equilibrium emerges for particular configurations of mint prices. Paper notes under a gold standard can be thought of as a special case of their model in which one of the "currencies" is a "token" with zero intrinsic value. The positive "mint price" is equivalent to the convertibility requirement that notes be redeemable in gold. The small-coin shortage equilibrium in the Sargent and Velde model closely resembles the panic-driven shortage of notes described by Thornton, in which a rise in the perceived risk of default on a country bank's notes causes them to disappear from circulation as holders seek to redeem them at par.

The failure of the Federal Reserve to counteract shifts in the demand for base money in the early 1930s is the cornerstone of the Friedman and Schwartz narrative of the collapse of the US money supply and the dramatic deflation of the early Great Depression (Bordo and Wheelock 2011). The Federal Reserve could have increased the supply of its monetary liabilities via discount window lending, but it could have done so just as well via open market purchases of US Treasury securities. In fact, in 1932, open market operations briefly stabilized monetary conditions, but the efforts were cut short because of a lack of understanding among key decision makers (Friedman and Schwartz 1963, 407–19; Meltzer 2003, 272–82; Bordo and Sinha 2016; Humphrey and Timberlake 2019, 79–85; Hetzel 2022, 177–79). Thomas Humphrey and Richard Timberlake (2019) document how the real bills doctrine led Fed officials to misread signals after 1929 and keep monetary policy excessively tight. Central to their confusion was the belief that the effect of monetary expansion depended on whether it was accomplished by buying government securities or by lending on real bills; the former was thought to be inherently inflationary and inferior to the latter.[28] In

27. In the monetary models of Champ et al. (1996) and Williamson (2004b, 2012), the government supplies fiat money, and shifts in demand can induce offsetting changes in the price level.
28. For a review of how Federal Reserve lending doctrine evolved from the real bills doctrine to 21st-century practice, see Lacker (2019).

contrast, for Thornton and Bagehot, it was immaterial what type of assets the central bank acquired.

Since the publication of Friedman and Schwartz's *A Monetary History*, Ben Bernanke (1983) has argued that the waves of bank failures during the Great Contraction had an independent contractionary effect—above and beyond the effect of the monetary contraction—by depleting organizational capital associated with information-intensive lending relationships. In an interview published in 2007, Bernanke cited two lessons he drew from *A Monetary History*. The first was:

> That a central bank's primary responsibility is the maintenance of price stability . . . and particularly to avoid the instability of expectations associated with an unanchored price level. The second lesson is that the financial industry is a special industry in terms of its role in macroeconomic stability. Major upheavals in the financial system can be extremely disruptive to the economy.[29]

The first lesson was the core consideration for Friedman and Schwartz, but as Robert Hetzel (2022, 470) notes, "the second lesson is pure Bernanke." Disruptions in the financial system were relevant in *A Monetary History*, as they were for Thornton and Bagehot, precisely because they threatened the money stock and price stability. Friedman and Schwartz were clear that the effect of bank failures was mediated through their effect on the money supply:

> If the bank failures deserve special attention, it is clearly because they were the mechanism through which the drastic decline in the stock of money was produced, and because the stock of money plays an important role in economic development. The bank failures were important not primarily in their own right, but because of their indirect effect. If they had occurred to precisely the same extent without producing a drastic decline in the stock of money, they would have been notable but not crucial. If they had not occurred, but a correspondingly sharp decline had been produced in the stock of money by some other means, the contraction would have been at least equally severe and probably even more so. (Friedman and Schwartz 1963, 352)

29. The interview with Ben Bernanke is published in Parker (2007, 66) and cited in Hetzel (2022, 470).

Thornton shows no sign of concern about the independent effects of contracting bank lending per se, apart from its effect on monetary conditions, and so he appears squarely aligned with Friedman and Schwartz on this issue.

After the Treasury-Fed Accord of 1951 ended the Fed's commitment to pegging government yields, the Fed adopted new operating procedures that focused on money market interest rates and relied predominantly on open market purchases and sales of Treasury securities. Because of concerns that discounting was blunting the restrictive effect of rising Treasury rates, regulations were revised in 1955 to more firmly instill a reluctance to borrow among member banks while retaining the ability of the window to act as a "safety valve" for temporary, unanticipated reserve drains at individual banks in a fragmented banking system. Discount window lending was demoted to an auxiliary role in the implementation of monetary policy (Meltzer 2009, 75–78). As the Fed moved toward targeting interbank interest rates more overtly in the 1990s, discount window lending was routinely sterilized by selling Treasury securities to offset the added bank balances at the Fed. In 2003, the Fed adopted a policy of keeping discount rates 100 basis points above the federal funds rate target set by the Federal Open Market Committee (FOMC) and eliminated the administrative efforts to discourage or limit borrowing (Madigan and Nelson 2002). Such efforts were no longer necessary, since the discount rate was generally above the market funds rate.

Beginning in the 1970s, Federal Reserve lending played a role in the resolution of increasingly high-profile financial institutions and in the amelioration of episodes of financial market distress (Nurisso and Prescott 2020). Such lending was almost always sterilized to avoid interfering with interest rate management. An exception was in the aftermath of the September 11, 2001, attack on the World Trade Center, when computer failures caused reserves to accumulate at the Bank of New York and drain out of the rest of the banking system. The Fed provided unsterilized credit alongside open market Treasury purchases, precisely in accord with Thornton's conception of last-resort lending (Lacker 2004, 956; Williamson 2004a).

The distinction between sterilized and unsterilized asset acquisition is important because unsterilized lending mobilizes a central bank's unique authority to expand the supply of high-powered monetary instruments. Sterilized lending, in contrast, uses the central bank's ability to sell government securities, which is certainly not a unique central bank attribute.

Before 2008, the Fed's monetary policy operations *automatically* counteracted shifts in the demand for base money, as Thornton envisioned, but with purchases and sales of government securities without loans to private entities.

The Federal Reserve Bank of New York bought and sold US Treasury securities, adding or draining reserves each day in the process, in order to keep the funds rate in line with the FOMC's target for the federal funds rate. Banks were entitled to freely convert those balances to Federal Reserve notes and vice versa (Meulendyke 1998). A shift in the public's holdings out of bank deposits and into currency would drain reserves from the banking system as banks used their Fed balances to obtain currency from the Fed. As the banking system sought to rebuild reserves, the resulting increase in the demand for reserve account holdings would automatically be accommodated on a daily basis by the New York Fed through purchases of Treasury securities. An operating regime that targets the interest rate for interbank loans will implement the crisis monetary expansions recommended by Thornton and Bagehot automatically, as a matter of course.[30]

Financial market turmoil impinged on the market for interbank lending in August 2007. Until then, Fed credit extension was generally for very small amounts.[31] The growing expected losses on subprime mortgages raised counterparty risk premiums in wholesale funding markets, particularly markets for the asset-backed commercial paper issued by large banks through off-balance sheet entities (FOMC 2007d, 3–6; Taylor and Williams 2009; Covitz et al. 2013). In response, some banks began holding larger reserve account balances. The resulting increase in the level and volatility of reserve demand made it difficult for the New York Fed's trading desk to calibrate their regular morning open market interventions.

Moreover, demand would fluctuate noticeably over the course of the trading session. Net demand for reserves was relatively high in the morning when European banks were active in the US funds market but then softer in the afternoon after European banks had closed for the day (FOMC 2007a, 3–4). Interbank funds trading on August 9 was particularly volatile.[32] Chairman Bernanke later described the New York Fed's $24 billion intervention that day as consistent with the "lender-of-last-resort concept" (Bernanke 2015, 144). The intervention

30. Marvin Goodfriend and Robert King (1988, 17) describe Bagehot's prescriptions as interest rate smoothing.

31. Between January 15, 2003, the beginning of the new discount window regime with the discount rate consistently above the federal funds rate target by 100 basis points, and July 25, 2007, just before the financial market turmoil began affecting the interbank lending market, loans by Reserve Banks (primary, secondary, and seasonal credit) averaged $50 million. Total consolidated assets of the Federal Reserve Banks ranged between $700 billion and $900 billion. Author's calculations based on information from the FRED database. See the data appendix for details.

32. Excess reserves—the amount held above reserve requirements—averaged $9.2 billion during the two-week period ending August 15, 2007, compared with an average of $1.7 billion during the previous period stretching back to December 12, 2002. Author's calculations based on information from the FRED database. See the data appendix for details.

would qualify as a lender-of-last-resort operation under the narrower monetary definition of Humphrey (1975, 1989), Bordo (2014), and others cited earlier. Under the broader credit definition, the intervention would qualify only to the extent that repurchase agreements are functionally equivalent to a loan collateralized by Treasury securities. In legal terms, however, as well as common parlance, repos are generally considered an open market operation in government securities. Marvin Goodfriend and Robert King (1988) would classify them as pure monetary policy actions.[33]

The Fed's August 9, 2007, open market operations were qualitatively different from the credit programs that the Fed subsequently rolled out in early 2008, such as the Term Auction Facility (January) and the Primary Dealer Credit Facility (March). Lending under those programs resulted in reserve injections, which were drained by the Desk to maintain the interest rate target. Until October 2008, all the Fed's special lending was sterilized and thus was inconsistent with Thornton's prescription. The crisis response that Thornton urged for the Bank of England was unnecessary in the United States in early 2008, however, because fractional-reserve monetary instability was absent. Deposits at commercial banks were stable and, in fact, grew during the flight to quality in the tumultuous weeks of September 2008 before falling back to trend. Some less creditworthy banks saw deposit runoffs, but these tended to be gradual and resulted in deposits shifting to other banks, leaving aggregate deposits and the deposit-to-currency ratio unaffected. The money multiplier did plummet in the fall of 2008, but that was the result of the rapid expansion of reserve balances, not of any noticeable movement out of bank deposits. The ratio of deposits to currency was remarkably stable, showing no significant shift toward currency (Grossman and Rockoff 2016).[34] The type of monetary instability that Thornton described and urged the Bank of England to combat did not occur in 2008.

The Fed's balance sheet changed dramatically in the fall of 2008. On October 1, 2008, just as the New York Fed exhausted its ability to sterilize the new

33. Since the late 1960s, the New York Fed's repo operations have also included agency debt and agency-backed mortgage-backed securities. Authority to do so arose in the late 1960s under pressure from Congress to treat the securities of the housing finance agencies on the same footing as Treasury securities. See Haltom and Sharp (2014). To the extent that such entities were not backed by the full faith and credit of the US government, they more clearly qualified as credit policy rather than monetary policy operations. Under the conservatorships that began in September 2008, however, agency obligations are close to equivalent to Treasury obligations.
34. From the beginning of September to the beginning of December 2008, M1, deposits at commercial banks, currency in circulation, M2, and the monetary base grew by, respectively, 9.2 percent, 2.3 percent, 4.5 percent, 4.3 percent, and 73.8 percent. Author's calculations based on information from the FRED database. See the data appendix for details.

wave of credit programs, the Federal Reserve obtained the authority to pay interest on reserve account balances.[35] In the wake of the turmoil following the Lehman Brothers and AIG (American International Group) failures, the Fed expanded lending rapidly via new and expanded credit programs. It was no longer able to drain all the reserves being added.[36] Without sterilization, the banking system's reserve balances ballooned and drove the federal funds rate below the FOMC's target. At its December 2008 meeting, the FOMC set a target range for the federal funds rate of 0 to 0.25 percent, and the Board of Governors set the interest rate on reserves at 0.25 percent. Since then, the Fed's large-scale asset purchase programs (LSAPs) have injected enough reserves to effectively satisfy the banking system's demand, driving the federal funds rate to below the interest rate on reserves.[37]

The Fed's LSAPs make unsterilized asset purchases that superficially resemble the monetary expansion Thornton recommended for the Bank of England. There are, however, distinct differences. Increasing the supply of the Bank of England's note liabilities affected the amount of monetary instruments in the hands of the public. In contrast, the size of the Fed's monetary liabilities has been largely irrelevant to the ultimate money supply.[38] Banks' account balances must satisfy legal reserve requirements set by the Fed, but those requirements are rarely binding because aggregate reserve balances have been far higher than required reserves.[39] Bank reserves are also a component of the pool of readily marketable assets held to meet liquidity needs; other components include short-term securities issued by the US Treasury or US agencies. Various regulatory and supervisory constraints stipulate minimums for banks' total liquid assets. Since the early 2010s, aggregate reserve account balances have been between 30 and 50 percent of the banking system's total liquidity (Ihrig et al. 2019, 184). Rates of return on these other liquid assets must adjust to leave banks indifferent between

35. The Financial Services Regulatory Relief Act of 2006 authorized the Reserve Banks to begin paying interest on October 1, 2011. The Emergency Economic Stabilization Act of 2008, passed on October 3, made that authorization effective October 1, 2008.
36. On December 31, 2008, Fed holdings of US Treasury and federal agency securities amounted to $497 billion, down from $755 billion at year-end 2007. Of that, $200 billion was earmarked for potential use in two security lending programs, leaving $297 billion that was theoretically available for sterilization operations. This amount would have been insufficient to drain excess bank reserve account balances, which totaled $838 billion on December 31, 2008 (Markets Group of the Federal Reserve Bank of New York 2009, 28).
37. See Ihrig and Wolla (2020) for a description of the Fed's new regime.
38. See Ennis (2018) for a model in which prevailing monetary conditions are unchanged over a range of reserves supply in the presence of interest on reserves. See also Ennis and Sablik (2019).
39. The Federal Reserve reduced reserve requirement ratios to zero as of March 26, 2020.

holding them and holding reserves, but because they are virtually perfect substitutes in meeting liquidity requirements, rates of return across these assets will be quite close to the interest on reserves. As a result, the quantity of reserves supplied by the Fed via asset purchases or credit extension can be expected to have, at least locally, virtually no effect on banks' incentive to make loans or accept deposits, and thus virtually no effect on monetary conditions or interest rates.

Some writers connect the behavior of repo and commercial paper markets in August 2007 with the idea of bank runs and the utility of central bank last-resort lending (see, for example, Gorton 2012, 196). Institutional investors apparently shifted from risky money market securities, such as asset-backed commercial paper, into less risky securities (Covitz et al. 2013). Similarly, investors pulled away from some repo market counterparties whose creditworthiness had deteriorated (Gorton 2010, 133–35). More broadly, the events of 2007–9 have given rise to the idea that the inherent fragility of nonbank financial intermediaries is a close replica of historical instances of banking fragility and thus warrant a central bank lending backstop (Gorton 2012, 198). However, this line of reasoning neglects a central feature of Thornton and Bagehot's thesis. The Bank of England possessed an effective legal monopoly on the issue of a critical monetary instrument, just as the Federal Reserve has a monopoly on the issue of bank reserve account balances. Since nonbank intermediaries do not themselves hold Federal Reserve account balances, their distress requires a Fed response only to the extent that it induces an indirect increase in demand for the Fed's monetary liabilities. Such an increase would be accommodated automatically under the Fed's interest rate targeting procedures, as occurred in August 2007. In fact, a broad shift out of risky assets in late 2008 appeared to increase the demand for US Treasury securities and thereby drive short-term yields *down*, which is the opposite of the scenario Thornton described, in which demand for Bank of England notes drove short-term yields *up*. Credit market developments that do not implicate the demand for the monetary liabilities of the central bank would appear to be unrelated to lender-of-last-resort responsibilities as understood in Thornton's day. In this sense, they qualify as what Anna Schwartz (1986) termed *pseudo-financial crises*.

6. Money and Credit

For Thornton, boosting central bank monetary liabilities was critical to resolving the crises he observed. The phrase "lender of last resort," though, is often equated with central bank intervention in credit markets, independent of central bank

monetary liabilities—that is, even if the intervention is sterilized. Moreover, open market operations are sometimes not considered lender-of-last-resort actions, even if they alter the supply of base money, because they do not involve private credit markets. Thornton directly addresses the interplay between money and credit markets in a crisis. He recognizes that some borrowers become constrained, and yet he emphasizes that the fundamental problem is a lack of means of payment, not a lack of credit per se to constrained borrowers. His description of credit market stringency is vivid:

> When an interruption of the usual credit arises, it naturally happens that the individuals having the least property, and the fewest resources, are the most pressed; and it is sometimes assumed by the public, rather too readily, that those who suffer are justly punished for the too great extent of their speculations. It is true, undoubtedly, that those who prove to be the first to fail, have probably been men of too eager and adventurous a spirit. Let the spirit of adventure among traders, however, have been either more or less, the interruption of the usual credit cannot fail to cause distress; and that distress will fall upon those who have merely been, *comparatively,* the more adventurous part of the trading world. (Thornton [1802] 1939, 120; emphasis original)

Thornton portrays traders as lying along a spectrum according to the extent of their risk-taking. Tight credit markets will have differential effects. Those who are seen to have been relatively more "adventurous" now provide less promising prospects for repayment and bear the brunt of the changing market conditions. The public understandably attributes credit constraints to prior overextension. This attribution is a mistake, Thornton will argue, because tight credit markets are a consequence of an insufficient supply of monetary instruments.

Accounts of the crises of 1793 and 1797 agree that there was a widespread experience of feeling constrained by the inability to obtain the desired means of payment through borrowing or discounting bills. The scramble for cash was thus a two-sided affair—people were unable to obtain the cash they wanted in exchange for a credit instrument, such as a bill drawn by their customers or their own IOU. Disentangling credit and money channels in historical accounts can be complicated by the practice of 18th- and 19th-century writers sometimes using the terms *money* and *credit* interchangeably. Paper instruments came in a variety of forms, ranging in creditworthiness from Bank of England notes at the safe end of the spectrum to country bank notes to various types of

bills of exchange. In some settings, manufacturers and merchants found it to their mutual advantage to accept bills in exchange for goods—see, for example, Innes's testimony quoted in section 3 or Thornton's description of the practice (Thornton [1802] 1939, 76–77). One pictures ongoing relationships with better information about the counterparty and repayment incentives enhanced by reputational considerations. In some settings—making wage or retail payments, for example—information was less reliable, and some form of money was required.[40] In more anonymous transaction settings, credit arrangements were infeasible or inferior to gold or well-recognized bank notes. The critical markets were those in which people who had accepted bills in payment traded them for the monetary instruments they required for other transactions—that is, discounting. One can understand the synonymous use of *money* and *credit* because they were two sides of the same trade. A scarcity of monetary instruments, therefore, reduces the perceived supply of credit. In the passage quoted, Thornton argues that credit market constraints are the consequence not of borrowers being viewed as uncreditworthy but of a lack of monetary instruments in general circulation. Thornton thus aligns with what Bernanke (1993) terms the *money view* as opposed to the *credit view*.

A central theme underlying the credit view is the crucial role of firms' net worth in limiting borrowing capacity. Thornton ([1802] 1939, 120) criticizes the view that a crisis indicates a lack of equity funding: "It is often also assumed by the public (and without the least foundation) that the want not of gold merely but of bonâ fide mercantile capital in the country is betrayed by a failure of paper credit." Earlier, Thornton ([1802] 1939, 79) identified "mercantile capital" as what would today be called the net worth of a firm, including inventories, fixed assets, and the trade credit the firm has extended, but deducting debt obligations. Deficiencies in net worth figure prominently in the credit view rationale for central bank lending. Ben Bernanke and Mark Gertler (1990, 107–8), for example, argue that Federal Reserve lending (even if sterilized) involves a redistributive transfer component that is useful because it bolsters the net worth of key financial market participants. Thornton argues that the supply of payment instruments is the problem, not a lack of net worth:

> The evil, therefore, consists not in the want of bonâ fide capital, but in the want of such a quantity of the circulating medium as

40. This brings to mind monetary models in which credit instruments are used in addition to base money as a means of payment, as in the models of Robert Townsend (1980), Robert Lucas and Nancy Stokey (1983), and S. L. Schreft (1992).

> shall be sufficient, at the time, to furnish the means of transferring the goods of the manufacturer from his own warehouse to that of the factor and the shopkeeper. The quantity wanted to be employed in the circulation, and especially the quantity of gold, becomes more, as was observed in the third chapter, when confidence is less, because the rapidity of the circulation is less. The substitution of gold for paper, and of better paper for that which is worse, and some temporary increase of the gold and good paper actually circulating, are obviously the remedy. (Thornton [1802] 1939, 120)

In chapter 3, Thornton describes how crises give rise to the hoarding of gold and Bank of England notes ("good paper"). A greater quantity is, therefore, required to carry out transactions. The problem is that the supply of circulating gold and Bank notes needs to expand.

Proponents of the credit view argue that informational frictions in credit markets enhance the importance of financial intermediary net worth.[41] Thornton recognizes credit market imperfections, but he favors the money view, nonetheless. He is well aware of the painful effects of credit market stringency, and his account is not inconsistent with the existence of credit market imperfections owing to limited information.[42] The passage quoted, for example, acknowledges that credit constraints fall unevenly across merchants. Elsewhere, Thornton notes the relevance of moral hazard to lending decisions (Thornton [1802] 1939, 188). But borrowers are offering their own obligations in exchange for gold or Bank notes, which can be used as means of payment. The supply of the latter is diminished in the crises Thornton observed; goods are piling up at some traders while other traders' shelves are empty. Increasing the supply of payment instruments to accommodate increased demand should allow market transactions to channel credit appropriately, even taking into account the resource cost imposed by credit market frictions, just as Goodfriend and King (1988) argued.

41. "An alternative to this conventional view holds that the credit creation process, far from being a perfectly functioning machine, may sometimes work poorly and even break down. Furthermore, according to this alternative perspective, fluctuations in the quality of credit creation have implications for aggregate variables such as output, employment, and investment" (Bernanke 1993, 50).
42. See Williamson (2012) for a model with imperfect information and "rationing" in credit markets in which targeted central bank lending does no apparent good other than redistribution and in which open market operations are sufficient for stability.

Describing the Federal Reserve's credit market interventions in early 2009, Bernanke contrasted the Fed's approach—which he described as "credit easing"—with the approach of the Bank of Japan, which was characterized by a focus on the quantity of bank reserves. "In contrast," he said, "the Federal Reserve's credit easing approach focuses on the mix of loans and securities that it holds and on how this composition of assets affects credit conditions for households and businesses" (Bernanke 2009). The mix of assets acquired by the Bank of England plays no role in Thornton's analysis. Bagehot is indifferent about the nature of the collateral taken, consistent with Michael Bordo's (2014, 127) definition of lender of last resort: "A lender of last resort is a monetary authority who can allay an incipient banking panic—a scramble for liquidity—by timely assurance that it will provide whatever high powered money is required to satisfy the demand." Demand for high-powered money was clearly satiated at the beginning of 2009. To put it another way, "credit easing" aims to take credit risk out of the private sector and on to the balance sheet of the central bank, while Thornton and Bagehot emphasized that the central bank can and should avoid taking on credit risk while acting as the lender of last resort.

7. The Interposition of 1793

The manner in which the 1793 crisis was resolved highlights the distinction between monetary and credit policy in the face of an internal drain.[43] After several prosperous years, late 1792 brought an economic downturn caused by poor harvests, and bankruptcies rose in the fourth quarter. The outbreak of hostilities on the continent led foreigners to sell British assets and remit the proceeds abroad. The French declaration of war on England in February 1793 spread fears of default and prompted runs on country banks. Some banks stopped honoring their notes, and others hoarded cash, leading to a shortage of circulating medium to make wage and retail payments. "That fear of not being able to obtain guineas, which arose in the country, led, in its consequences, to an extraordinary demand for bank notes in London; and the want of banknotes in London became, after a time, the chief evil" (Thornton [1802] 1939, 98). The Bank of England accommodated demands for discounting but refused several requests from country banks, some hundred of which were to fail. The Bank saw its gold reserves draining out

43. "The crisis of 1793 . . . had most of the ingredients of later crises and influenced subsequent discussions" (Wood 2005, 43). This account follows Clapham (1944, I: 258–65).

and warned the prime minister that it "suspected an extensive illegal export of guineas" (Clapham 1944, I: 260).

As distress spread, a group of city leaders met on April 22 with William Pitt the Younger, prime minister and chancellor of the Exchequer, to discuss a remedy; a select committee of 11 was formed to develop a plan for Parliament to intervene. On April 29, the committee reported to Parliament and presented a proposal designed "[t]o furnish some medium of circulation, which might either directly or indirectly replace the quantity of currency suddenly withdrawn; and, by the effect of these measures, to afford such assistance to individuals as might revive confidence and credit" (Great Britain 1793a, 19).[44] The committee's report takes pains to note that the problem affected solvent firms, not just those that have taken on ill-considered risk, and thus is an issue of "national importance."[45] Members of the select committee reported personal knowledge of as many as eight large London houses that were under pressure and in danger of having to stop payments. The Bank of England was unwilling to lend on the security of goods, as proposed by borrowers, because it was outside the normal practice (Great Britain 1793b, 329).

Under the plan submitted by the committee, Parliament was to authorize an issue of £5 million in Exchequer bills to be lent to applicants in denominations of £100, £50, "and possibly" £20, with maturities ranging up to a year. The bills would earn interest at a rate equivalent to 3.8 percent per year, while borrowers would be assessed interest at 5 percent per year. Borrowers would provide security either "on goods to be deposited in the hands of officers appointed by the commission, and which goods must actually be in London, or on securities arising from the joint concurrence of a number of persons of property uniting and subscribing for the support of any particular house" (Great Britain 1793a, 32–33).[46] Loans would be for no more than 50 percent of the value of the security.

44. Note the resemblance to the official title of the Federal Reserve Act, which begins: "An Act to provide for the establishment of Federal reserve banks, to furnish an elastic currency . . . ."

45. "[I]f the present distress were confined in its effects to individuals, however they might regret the extent of private calamity, they should not consider the case as justifying an extraordinary public interposition; much less should they recommend such a measure, if the pressure had been felt only by houses of doubtful credit, or who had suffered from the consequences of rash and unwarrantable speculation; but it appears to your Committee, that the embarrassments arising from the want of credit, have already affected houses of undoubted solidity, and sufficient ultimate resources, and that there is too much reason to apprehend, that these embarrassments may extend in a degree which no individual exertions can counteract, with sufficient expedition and certainty, to prevent consequences of the most serious national importance" (Great Britain 1793a, 18–19).

46. Most offered security via the second method, providing personal bonds (Thornton [1802] 1939, 186).

A set of commissioners would be appointed to decide on applications and administer the program. The plan was approved by a vote of 110 to 26.[47]

A critical feature of the plan was that the Bank of England would discount the Exchequer bills for £5 Bank notes.[48] The net effect was to increase the supply of Bank notes, backed by newly issued government debt rather than private obligations, to fill the gap in the circulating medium caused by the disappearance of country bank notes and gold. The convertibility into Bank of England notes was integral to the entire mechanism because the Exchequer bills themselves were issued in large denominations and would not have conveniently served as a circulating medium. (Exchequer bills had circulated briefly as means of payment in the 1690s, but in smaller denominations. Since that time, denominations had been larger, and Bank notes dominated circulation.) The cooperation of the Bank would seem to have been assured by the presence of several Bank directors among the group that approached the chancellor. Indeed, John Clapham suggests that Bank directors probably authored the plan.[49]

The operation was viewed as a success; one chronicler claimed that it worked "like a charm" (Macpherson and Anderson 1805, 269). Thornton later observed:

> The very expectation of a supply of Exchequer bills, that is, of a supply of an article which almost any trader might obtain, and which it was known that he might then sell, and thus turn into bank notes, and after turning into bank notes might also convert into guineas, created an idea of general solvency.[50] (Thornton [1802] 1939, 98)

Only £2,202,000 in Exchequer bills out of an authorized £5 million were ultimately issued (Clapham 1944, I: 265). According to Thornton ([1802] 1939, 186), "no part of the sum lent was lost." As Horner describes it, "The punctuality of the London payments being restored, the distress of the whole country was gradually removed" (Horner 1802, 193).

The Bank of England's role in the Exchequer bill mechanism amounted to pure monetary policy in the terminology of Goodfriend and King (1988),

47. Royal assent was received on May 9, 1793.

48. This feature was not mentioned in the committee's report, perhaps because discounting Exchequer bills at the Bank was routine and taken for granted. The stated purpose—"to furnish some medium of circulation"—probably referred to the Bank notes emitted rather than the Exchequer bills issued under the act.

49. "Who's the plan was that the Committee recommended and Pitt adopted we do not certainly know. It sounds like a Bank plan" (Clapham 1944, I: 263).

50. "Solvency" means "ability to pay," according to Samuel Johnson's ([1755] 2021) dictionary.

accompanied by a government-run credit program. The net result was an increase in the number of the Bank's notes in circulation, an equal increase in government securities on the Bank's balance sheet, and an equal increase in government loans to the public. The Exchequer bills funded a credit program administered by a separate, government-appointed commission. The loans advanced were outside the normal bounds of Bank credit extension. The money stock expansion was accomplished without the Bank taking on unwanted credit exposures to the private sector, thereby sparing the Bank the politically delicate task of choosing whom to rescue.[51] The Exchequer bill mechanism deployed in 1793 thus satisfied the principles of the "Credit Accord" proposed by Marvin Goodfriend (1994), under which credit extension to the private sector would be restricted to, or rapidly transferred to, the Treasury (see also Lacker 2009; Plosser 2009, 2022; Schwartz 2009). It shows a central bank that is alleviating distress by expanding the supply of its monetary liabilities without taking on private-sector credit exposures. The fact that Thornton, the originator of the insights that later became the lender-of-last-resort doctrine, endorsed the interposition of 1793 is further indication that central bank credit extension per se was not the object of or even essential to the idea.

8. The Imposition of 1825

The Exchequer bill mechanism implemented in 1793 was considered and rejected during the crisis of 1825.[52] At a critical juncture (December 14), the Bank of England, with the encouragement of the government, authorized the purchase of £500,000 in existing Exchequer bills (Fetter 1965, 113).[53] This purchase was a pure monetary policy action according to Goodfriend's definition and further

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51. In parliamentary debate, prominent opposition member Charles Fox complained that the appointed Commissioners "would necessarily create a great and new influence" with powers "liable to abuse" (Great Britain 1793b, 319).

52. For an overview of 1825, see King (1936, 35–38), Fetter (1965, 111–22), Neal (1998), and D. O'Brien (2003, 6–7).

53. Denis O'Brien (2003, 6–7) connects this episode to Walter Bagehot. He argues that the Bank's dramatic course change was attributable to a letter to the Bank early on the morning of December 14 from banker Vincent Stuckey, maternal uncle to Walter Bagehot, which, in turn, was prompted by an article published the day before by Thomas Joplin, "maverick pioneer of joint stock banking, and much else besides." Stuckey's Banking Company employed both Bagehot and his father, Thomas Watson Bagehot. The Stuckey and Bagehot families had been intertwined for generations, and Walter Bagehot held a sizable equity interest in his uncle's bank (Grant 2019, 3, 169). O'Brien (2003, 7) argues that Bagehot was "undoubtedly deeply impressed by the events of the 1825 crisis" and that his "classic statement of the role of the lender of last resort stems from the intervention of the outsider Thomas Joplin."

evidence that expanding the note issue was understood as the critical remedy in a crisis. The pressure was relieved, but, as Frank Fetter (1965, 119) describes, in February 1826, with conditions still shaky, "a group of London merchants petitioned the Commons for an issue of Exchequer bills," citing the 1793 interposition.[54] "The problem was debated both in the Commons and the Lords, and a discussion of broad principles as to whether action in a time of crisis should come from the Government or the Bank was mingled with partisan thrusts from the Whigs, and the airing of charges against the Bank." The government was firmly opposed, however. Nearly a year earlier, Prime Minister Lord Liverpool had specifically warned that such relief would not be forthcoming. Addressing the House of Lords on March 25, 1825, with the possibility of an imminent crisis in view, he noted how Parliament had provided aid to merchants and bankers through issues of Exchequer bills during the war but argued that such relief would be inappropriate in a time of peace.[55]

When the merchants' petition surfaced in February 1826, Liverpool's cabinet pressed the case against peacetime parliamentary relief. F. J. Robinson, chancellor of the Exchequer, told the House of Commons that if interposition was adopted again, "he could not see where the practice was to stop. On every occasion of distress, it would be called for, as, every time distress occurred, it would be represented as the most grievous calamity the country had ever endured . . . the proposed relief would unavowedly be, to offer a bonus to extravagant speculation."[56] Moreover, the precedent would adversely affect incentives. William Huskisson observed that if speculators "might always expect to obtain an asylum in government, it was as much calculated to encourage speculation as the poor-laws were calculated to encourage vagrancy, and to discourage honest industry."[57] Liverpool's speech the previous year was a similarly argued warning to country banks and "speculators" not to anticipate an emergency credit program resembling 1793. A replay of that program raised a more practical concern as well. Issuing more Exchequer bills might drive the price of existing bills below par, and since they were accepted at par in payment of tax obligations, a large

54. The petition can be found in the Hansard database of the UK Parliament at https://api.parliament.uk/historic-hansard/commons/1826/feb/23/commercial-distress-petition-of.

55. See the summary of Liverpool's comments in the Hansard database of the UK Parliament at https://api.parliament.uk/historic-hansard/lords/1825/mar/25/equitable-loan-bill-joint-stock-companies.

56. The quotation is found in the Hansard database of the UK Parliament at 14: 707, https://api.parliament.uk/historic-hansard/commons/1826/feb/23/commercial-distress-petition-of.

57. Huskisson's statement is found in the Hansard database of the UK Parliament at 14: 403, https://api.parliament.uk/historic-hansard/commons/1826/feb/14/bank-charter-and-promissory-notes-acts.

number would be paid into the revenue (Peel 1826; Great Britain Parliament House of Commons Committee of Secrecy on Bank of England 1832, 141).

Liverpool's government was well aware that the critical need was an expanded monetary base, which the Bank of England would have to address regardless of whether Parliament granted relief. Home Secretary Robert Peel, in a March 3, 1826, letter to the Duke of Wellington, then traveling in St. Petersburg, wrote:[58]

> As our issue of Exchequer Bills would have been useless unless the Bank cashed them, as therefore the intervention of the Bank was in any event absolutely necessary, and as its intervention would be chiefly useful by the effect which it would have in increasing the circulating medium, we advised the Bank to take the whole affair into their own hands at once, to issue their notes on the security of goods, instead of issuing them on Exchequer Bills, such bills being themselves issued on that security. They reluctantly consented and rescued us from a very embarrassing predicament. (Peel 1826)

The Bank had the legal authority to lend on the security of goods but, as a matter of policy, avoided it.[59] The Bank's leaders were perhaps swayed by the declaration a few days earlier by the foreign secretary, George Canning, that the government would resign should the merchants' proposal pass the house. After the Bank's assent reached Parliament, the matter passed away.[60]

The objections raised publicly by Liverpool and his cabinet to another 1793-style lending program funded by the issue of Exchequer bills would seem to apply with the same force to functionally equivalent lending by the Bank. Both mechanisms rewarded "speculators" and set unhelpful precedents with adverse incentive effects. Peel's letter reveals that the government was actually perfectly willing for such lending to take place but was unwilling to fund it via new debt issue for fear of the effect on the market for existing debt. Instead, the government imposed the obligation on the Bank, reckoning that the note issue was bound to expand in any event. As Fetter (1965, 116) notes, "Unlike 1793 and 1811

58. This passage is also quoted by Bagehot (1873, 99).
59. See note 66.
60. The Bank's leaders also may have felt on the defensive because of a January 1826 letter to them from Liverpool urging them to establish branches throughout the country and give up their monopoly on joint-stock banking outside of a certain distance from London, suggesting these measures as a price for extending the charter, which was due to expire in 1832. Liverpool's objective was to allow for healthier country banks. The letter is reprinted in Hutchinson (2020, 418–22).

the precedent was set that in time of crisis the Bank, not the government, was to be the instrument of action." Lending to the private sector was entirely separable from the Bank's monetary policy role, of course, a fact recognized at the time by David Ricardo (2004, 276–97), who wanted to nationalize the note issue and leave lending to the Bank, the inverse of 1793 roles. Instead, the Bank retained its note issue privilege and was on notice that crisis credit programs were its responsibility as well. What the Bank ultimately accepted as its role as the lender of last resort was a bundle—responsibility for monetary stability plus the emergency credit programs that the Parliament and the government were unwilling to perform themselves. While the Bank may not have fully assented until later in the 19th century, it was in 1826 that the British political system established the bundle that was on offer. Liverpool's management of the 1825 crisis thus began the equation of credit market intervention with the central bank's response to a crisis monetary contraction.

9. The Bank of England and the "National Interest"

The reluctance of the Bank of England to lend to the country banks in 1793 highlights the tension, which was to recur throughout the 19th century, between the Bank's pecuniary self-interest and its broader public policy role, owing to its note issue privilege, in ensuring monetary stability. This tension helps explain why the Bank was advised by Thornton and implored by Bagehot to lend in a crisis. The Bank was the repository of the nation's largest reserve of gold and the monopoly supplier of paper notes that circulated in London in place of gold. As Henry Thornton and others had come to understand, maintaining the value of the pound in gold required regulating the supply of Bank notes appropriately to facilitate the equilibrating effects of the specie-flow mechanism. Too much note issue would induce inflation and a rising price of bullion; too little would result in deflation and a falling price of bullion. Thornton made the case that the Bank bore responsibility for monetary stability; Bagehot felt compelled to press the same case 70 years later.

The Bank was a private enterprise, however, with profits accruing to shareholders.[61] In the case of gold draining out of the country, the Bank's pecuniary incentives were well aligned with the national interest in monetary stability. An external drain would push the market price of gold bullion above the mint price,

61. "For the Bank of England, like every other mercantile establishment, carries on its business on such principles as will produce a profit" (Thornton [1802] 1939, 163). See also Fetter (1965, 61).

inducing traders to melt the coin into bullion to be sold domestically or (surreptitiously) shipped abroad. The Bank would see its gold reserves decline as traders presented notes for guineas to melt. To replenish reserves and maintain its note circulation, the Bank would need to buy gold bullion on the market to be coined into new guineas at the mint. Rather than lose money on this round trip, the Bank had a strong incentive to restrict discounts and note issue. "The bank, if we suppose it, as we now do, to carry on this sort of contest with the melters, is obviously waging a very unequal war; and even though it should not be tired early, it will be likely to be tired sooner than its adversaries" (Thornton [1802] 1939, 147). Before the 1797 suspension, the Bank's retreat from purchasing bullion to convert to coin would reduce the Bank's note issue, causing a contraction in country bank note issue, thereby remedying the problem:

> The necessity which the Bank of England felt of curing any great excess of the market price above the mint price of gold, caused the limitation of Bank of England paper; and then this limitation, in proportion as it took place, produced the limitation of the paper of the country. It was in this manner that an excessive issue of the paper of the kingdom was restrained before the suspension of the cash payments of the Bank of England. (Thornton [1802] 1939, 219)

Conversely, gold inflows that put downward pressure on the market price of bullion made it profitable for the Bank to expand note issue by buying bullion to mint into guineas. Thus, the Bank's pecuniary interests were aligned with the equilibrating effects of the specie-flow mechanism.

In the case of an "internal drain," when guineas were flowing out of the Bank in response to a shift in domestic money demand, the Bank's pecuniary interest was not so well aligned. As we have seen, it required an expansion of the Bank's note issue, both to replace the country bank notes that were then disappearing from circulation and to counteract the decline in velocity and the money multiplier. The instinct of the Bank, however, was to restrain note issue to protect its gold reserve.

> But to enlarge the issue of their paper, at the very time that their fund of gold is diminishing, is a measure, which would confessedly be imprudent in every inferior establishment, and which on that account the directors of the great Bank have not always perceived that they were warranted, by the peculiarity of their situation, to adopt, as the real means of checking the drain of their gold. (Horner 1802, 192)

Recognition of the Bank's public responsibility was newly appreciated at the end of the 18th century (at least in some quarters)—a byproduct of the rise of country banks and the strains of wartime finance. After Parliament suspended convertibility in 1797, monetary policy was effectively under the control of the Bank, which was free of the discipline that convertibility imposed on note issue.

> If the Bank of England must now be considered as a national establishment, not merely influencing, by the superior magnitude of its capital, the state of commercial circulation, but guiding its movements according to views of public policy, an important revolution has taken place since the first erection of that corporation as a banking establishment. That power of issuing the medium of exchange, with the opportunities it implies of varying its quantity and value, which, while precious coin was in use, was executed under the immediate prerogative of the Crown, is now virtually vested in the Governor and Directors of the Bank of England. (Horner 1802, 196)

The meaning of these powers for the Bank's credit policy was central to the debate in 1810 about the high price of bullion. The point driven home by the Bullion Committee was that inflation was the consequence of the Bank acting on its incentive to overissue. Bank directors denied that restraining their note issue could bring the market price of bullion back in line with the Mint price and defended their avowed policy of issuing notes solely on the basis of discounting "bills of real value, representing real transactions."[62] They were reluctant to acknowledge that their note issue could be at fault if they were just meeting the demand for borrowing on "sound security."

The Bank of England's responsibility for monetary stability was still a contested issue when Bagehot wrote *Lombard Street* in 1873, and it was a central theme in his book:

> The directors of the Bank are, therefore, in fact, if not in name, trustees for the public, to keep a banking reserve on their behalf; and it would naturally be expected either that they distinctly recognized this duty and engaged to perform it, or that their own self-interest was so strong in the matter that no engagement was needed. But so far from there being a distinct undertaking

62. Statement of John Pearse, director of the Bank of England, to the Select Committee on the High Price of Gold Bullion, March 13, 1810 (Great Britain [1812] 1979, ccclxxix). See also Mints (1945, 50–51).

> on the part of the Bank directors to perform this duty, many of them would scarcely acknowledge it, and some altogether deny it. (Bagehot 1873, 18)

Bagehot ridiculed statements made by Bank directors to the Bullion Committee in which they denied that their note issue affected the price of bullion and claimed to act as any private bank would.[63] The central theme of *Lombard Street* is Bagehot's exhortation to Bank leadership to accept responsibility for monetary stability. Bagehot's famous "lend freely" dictum was crafted to counteract the Bank's pecuniary interest in avoiding the risk of expanding note issue in a crisis.

In contrast, the profit motive seems relatively unimportant to modern central banks (Goodfriend and Lacker 1999, 11; Goodfriend 2012, 48). The residual profits and losses of the Federal Reserve System, for example, accrue to the US Treasury after replenishing a surplus capital account that is now legally fixed. The Fed's governance structure is a public-private hybrid, but one in which the accountability to the national interest, as interpreted by the US Congress, appears to dominate pecuniary interests.[64] As a result, lending decisions can be more sensitive to the political risks of the institution being blamed for failing to prevent unpopular financial market turbulence. Modern central banks thus face incentives that are opposite to those of Thornton or Bagehot's Bank of England. The problem now is not how to *encourage* an independent central bank to undertake unsterilized balance sheet expansion but how to *limit* credit market interventions that exacerbate moral hazard problems over time (Goodfriend and Lacker 1999, 15–24; Goodfriend 2014, 117).

10. Why Was the Bank Reluctant to Lend into an Internal Drain?

Several considerations contributed to the Bank of England's reluctance to lend in the face of an internal drain. Sir Francis Baring claimed that in 1793 the Bank directors "caught the panic; their nerves could not support the daily and constant demand for guineas" (Baring 1797, 21). Hayek also questioned the directors' rationality, saying that after months of declining reserves, the directors "finally lost their heads and suddenly refused to grant further accommodation" (Hayek

63. "Very few persons perhaps could have managed to commit so many blunders in so few words" (Bagehot 1873, 87). See also Rockoff (1986, 162).
64. The Federal Reserve Banks are legally owned by their district member banks, but the dividend paid to shareholder banks is set by law. See Levin, Lu, and Nelson (2022) for an analysis of recent Federal Reserve System losses.

1939, 39). Both suggest irrational timidity or excessive fear of lending in aid of the country banks.

A director of the Bank, naturally, provided a more flattering explanation. Samuel Thornton—eldest brother of Henry and member of the group that proposed the plan to Parliament[65]—said that "[t]he Bank had stepped forward in the mode of discount; but it never had been their custom to advance money on mortgages, or on the species of security which is now pointed out [meaning inventories], not from any doubt of the security, but because they found an ample demand for their money in the way of discounts" (Great Britain 1793b, 321). The Bank had lent on mortgages soon after being established in 1694, but after the early 1700s, such lending was avoided as a matter of policy, even though there was mortgage paper circulating in London (Clapham 1944, I: 113–14, 249–50). The Bank also avoided taking as collateral goods or securities held outside of London,[66] although it would relent under pressure from the government in 1826 (Clapham 1944, 108–9; Fetter 1965, 119–20). Taking possession of pledged goods also risked running afoul of the trading prohibition in the Bank's charter.[67] The Bank was apparently unwilling to lower its credit standards at a time when general creditworthiness had deteriorated but instead wanted to "confine themselves to the sort of accommodation to which they had become accustomed" (Great Britain 1793b, 337). Evidently the supply of more creditworthy borrowers was sufficient to allow the Bank to achieve its note issue objectives.

Incentive effects

Henry Thornton was also more sympathetic to the Bank's plight. He suggested that Bank lending should take into consideration the moral hazard engendered by lending to country banks:

> It is by no means intended to imply, that it would become the Bank of England to relieve every distress which the rashness of country banks may bring upon them: the bank, by doing this, might encourage their improvidence. There seems to be a

65. In the 19th century, Henry was sometimes mistaken for Samuel. See Peake (1995).
66. "Several opulent houses, that applied for assistance, were refused discounts, because they did not offer London securities" (Horner 1802, 192).
67. Bank of England Act 1964, 5 & 6 Will. & Mar. c. 10, Section 26. Thornton ([1802] 1939, 186) notes that if the Bank were to exchange gold for goods, it would become a trading company, which was against its charter, and if it took goods as security, it would "prevent them from passing into consumption." Either approach would be statutorily inconsistent with being only a banking company.

> medium at which a public bank should aim in granting aid to inferior establishments, and which it must often find very difficult to be observed. (Thornton [1802] 1939, 188)

A purely self-interested lender will take into consideration the effects of their credit extension on their borrower's incentives. Moral hazard of a broader sort is a frequently cited reason to limit modern central bank lending.[68] Setting new precedents that expand the perceived boundaries of central bank lending can affect the incentives of other potential borrowers well into the future. So even a central bank acting in perfect accord with the national interest would want to constrain lending to appropriately limit adverse incentive effects. Moral hazard considerations underpinned the reluctance of the Bank directors that Bagehot perceived and railed against, though Bagehot apparently judged this a "minor point" (Rockoff 1986, 165). Wood (2003, 344) argues that moral hazard was "well understood" and that the Bank of England "made no explicit commitment" in the 19th century. While Thornton clearly thought that incentive effects were a valid reason for a central bank to ration credit, his view nonetheless was that the Bank should have lent more than it did.

Usury ceilings

The operation of usury laws also may have contributed to the Bank's reluctance to lend. From 1713 to 1833, interest rates, including discount rates on bills, were limited to 5 percent (Rockoff 2009, 290). Elements of the government debt were actively traded, however, and provided market opportunities for investing at above the legal rate (Pressnell 1956, 97). When the balance of borrowing and lending drove market rates above the usury ceiling, discounters in the market for bills limited their lending, drawing funds away from discounts and commercial paper (King 1936, 14–15). The Bank, with its note issue privilege, could afford to continue lending if it so desired.

Sir Francis Baring, immediately following the claim that directors had "caught the panic," directly identifies the last-resort role of the Bank with the effect of binding usury ceilings. In 1793, the flight from country banks increased the demand for guineas "from every quarter of the country." Baring says:

68. See Goodfriend and Lacker (1999) for a comparison of the incentives of private-sector line-of-credit providers and central bank provision of the same service. Regarding the incentive effects of central bank lending, see Lacker (2008, 2009, 2012, 2015).

> In such cases the Bank are not an intermediate body, or power; there is no resource on their refusal, for they are the *dernier resort*. The laws against usury effectually destroy every other means of relief in this country, whilst experience has proved, at Hamburgh, at Amsterdam, and other places, that the most effectual mode of keeping the rate of interest low, is to leave it free from every restriction. (Baring 1797, 22)

Baring's pamphlet used the term *dernier resort* just one other place—a passage describing the events leading up to the restriction of 1797 in which he says that government borrowing in the spring of 1796

> produced some effect on the course of exchange, but still more on the rate of interest in the country, which was soon pushed beyond what is allowed by law to be received; as the merchants, manufacturers, & c. can pay no more than 5 per cent. per annum, and as money was not to be obtained at that rate in the market, they were driven once more to the Bank as a *dernier resort*. (Baring 1797, 47)

Posting a discount rate above the legal limit was not possible for the Bank, and its note issue privilege allowed it to lend even when market rates were higher. Baring describes Bank of England lending as the last resort, not because of any inherent credit market failure or banking fragility, but because usury laws had suppressed every other source of credit in times of stress.

Henry Thornton cited the usury laws as a reason the Bank might justify limiting its discounts in times of war when government borrowing drove up market rates:

> The borrowers, in consequence of that artificial state of things which is produced by the law against usury, obtain their loans too cheap. That which they obtain too cheap they demand in too great quantity. To trust to their moderation and forbearance under such circumstances, is to commit the safety of the bank to the discretion of those who, though both as merchants and as British subjects they may approve in the general of the proper limitation of bank paper, have, nevertheless, in this respect, an individual interest, which is at variance with that of the Bank of England. (Thornton [1802] 1939, 255)

Horner, summarizing Thornton with characteristic clarity, put it this way:

> There may be disposition among very rich traders, to borrow a sum far exceeding what it would be proper for the Bank to lend, although it entertained no doubt of punctual repayment. But, by the laws that confine the rate of interest, and which still remain in force after every competent judge has been long convinced of their uselessness and inconvenience, the Bank of England is deprived of the most natural and simple means of restricting the amount of its loans. (Horner 1802, 195)

Binding usury limits implied that the quantity of Bank loans demanded was inefficiently large. Thus, even from the benevolent perspective of the "national interest," lending *ought* to be constrained to some extent, particularly when the diversion of real resources to a war effort is desired.[69]

Many modern central banks are similarly capable of lending at below-market rates because they benefit from the same type of funding privileges that the Bank of England enjoyed—monopoly liability issuance and indemnification by fiscal authorities. The capability of providing credit at below-market terms is often mentioned in the credit channel literature as a rationale for central bank credit market intervention. In a widely cited paper, Bernanke and Gertler (1990, 108) wrote, "The Fed's measures must be viewed as having a transfer component; if they were not concessionary in some way, they could have been performed by private lenders." Note that the situations identified as financial fragility in Bernanke and Gertler's (1990) model are Pareto efficient; financial distress in the form of credit constraints cannot be alleviated feasibly, taking into account information constraints, without transfer payments that make some agents in the model worse off.[70] In contrast, usury ceilings, as price controls, are generally inefficient. Bank of England lending might have alleviated deadweight loss associated with usury laws, in addition to its effect on monetary stability, but some rationing would be required.

Modern crisis borrowers are not typically constrained by usury ceilings. While some consumer borrowing is subject to interest rate ceilings, interest rates faced by financial institutions are generally not legally constrained. Ironically, it is not clear that Baring would designate present-day central banks the *dernier resort* in the same sense that he applied that term to the Bank of England in 1793 and 1797.

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69. Charles Calomiris, Marc Flandreau, and Luc Laeven (2016) cite a lender-of-last-resort intervention by Emperor Tiberius in 33 AD occasioned by the imposition of a usury ceiling.
70. For a review of the economic models of central bank lending, see Ennis (2016).

Politics

Another motive for the Bank's restrictive credit policy in 1793 might be found in the factional rivalries of 18th-century British politics. At its founding, the Bank was seen as aligned with the 17th-century Whigs. Its creation was promoted by London merchants and financiers and opposed by Tories and Jacobites, who feared it would strengthen republican government, and by country landowners, who feared it would strengthen London financial interests at their expense (Andreadēs 1924, 67–71; Pincus 2009, 394–99). Its shareholder and director lists were predominantly London merchants (Carruthers 1996, 25, 144, 155). Shortly after the Bank was established, Tories promoted a rival institution, a "National Land Bank," whose aim was raising more funds for the state and helping "country gentlemen" extract ready money from their land holdings. The subscription failed, however (Clapham 1944, I: 33–34). At the Bank's first charter renewal in 1697, it obtained a provision blocking Parliament from establishing any other bank (Clapham 1944, I: 47). The Bank was initially eager to enter the mortgage business itself. According to Clapham (1944, I: 113–14), plenty of mortgages were available on the London market, and in late 1694, the Bank's directors voted to begin lending on mortgages at 5 percent in the new year. "A fair number of applications were dealt with" in the first few years, "but the business did not grow." Clapham speculates about the reasons, including the possibility that "Tory squires, advocates of a Land Bank, gave instructions not to apply."[71] Party identification realigned under George III, especially after 1783. If the Bank's earlier political alignment with urban mercantile interests as opposed to country elites persisted into the late 18th century, it may have bolstered the Bank's reluctance to come to the aid of the country banks.

Political controversy is certainly no stranger to 21st-century central banks. Lending policies are particularly touchy, often viewed as channeling subsidized credit to favored sectors, whatever their macroeconomic benefits. Since 2008, the Fed has been on the defensive against the charge of prioritizing the provision of credit to money center financial institutions in preference to the so-called Main Street economy. One argument in favor of a Treasury–Fed Credit Accord is that it would help keep the Federal Reserve out of political entanglements associated with inherently distributional lending activities and thereby preserve maximal political capital for the defense of the independent conduct of monetary policy (Goodfriend 1994, 2012, 2014).

71. Clapham (1944, I: 114) also cites the possibility that "scriveners were jealous of the Bank and took their mortgages elsewhere," and that the directors may have come to dislike "the long dragging supervision of mortgages, with the possibility of having to foreclose."

11. Why Not Buy Government Debt?

If the supply of the monetary base was paramount to advocates of lender-of-last-resort principles and there were impediments to private-sector lending, why not have the Bank buy government obligations directly? Why didn't Thornton advocate open market operations in a crisis? The answer may lie in the governance around the Bank of England's advances to the government. After the Glorious Revolution, Parliament's ability to constrain Bank loans to the government was crucial to maintaining the Crown's ability to credibly commit to debt repayment without debasement. The original charter prohibited the Bank from advancing any more than the initial £1.2 million to the government without an act of Parliament. Over the course of the 18th century, prime ministers often pressed the Bank for additional credit, particularly in the run-up to charter renewals, which were made contingent on further perpetual loans from the Bank funded through new capital subscriptions. By 1746, the debt to the Bank, authorized by Parliament, had grown to £11,686,800.

The statutory funded debt was not the only credit the Bank provided to the government. Since the beginning, the Bank had discounted Exchequer bills and various other securities issued in anticipation of tax sources, such as the land tax and the malt tax. These amounts grew to dwarf credit extended to private parties (Clapham 1944, I: 211). The 1708 charter renewal stipulated that the Bank had to consent to the amount of Exchequer bills the government issued to the public; the Bank would be bound to honor these bills when presented for discount by private parties. In the later part of the 18th century, the permitted amount was the subject of negotiation and an annual contract with the prime minister, with Bank leaders at times registering objections and worrying about whether discounts might be a violation of the prohibition on advances without a vote of Parliament (Clapham 1944, I: 191–92, 210). Legislation in 1819 (59 Geo. III, c. 76) forbade any advance by the Bank to the government "on the security of exchequer bills, treasury bills, or other similar security, without the express consent of Parliament," suggesting that not all advances had the express approval of Parliament before then (Philippovich 1911, 217).

These cross-currents came to a head when war broke out in the 1790s.[72] Pitt's relationship with the Bank involved repeated wrangling, with Pitt laying claim to allegedly unused funds and pressing the Bank to accept more bills. The Bank's objections ultimately proved futile (Clapham 1944, I: 187, 212–13). Pitt's

72. See Antipa and Chamley (2024) on relations between the Bank and the government during this period.

efforts to mobilize resources for war with France coincided with the 1793 banking crisis. In that context, the Bank's autonomously choosing to discount more Exchequer bills to expand the note supply in the manner envisioned by Thornton would have raised sensitive constitutional questions. Bank directors may have been reluctant to independently expand lending to the government and be seen as usurping Parliament's authority to regulate official resources or thwarting the will of a body that supported Pitt. Given the delicacy of public finance during times of war, it was natural to equate the management of the Bank's note issue with the management of its private lending.

While outright purchases of government debt would have raised sensitive political issues, the Bank was in the practice of discounting government securities—that is, taking government securities as collateral, more or less equivalent to the Fed's open market operations in repos. Several passages in *Lombard Street,* for example, make clear that Bagehot viewed lending on government securities and lending on privately issued debt as equivalently effective means of responding to a crisis. This view is most evident in Harman's 1832 testimony, which Bagehot quotes approvingly:

> We lent it by every possible means and in modes we had never adopted before; we took in stock on security, *we purchased Exchequer bills*, we made advances on Exchequer bills, we not only discounted outright, but we made advances on the deposit of bills of exchange to an immense amount, . . . (Bagehot 1873, 25; emphasis added)

In fact, Bagehot (1873, 101) advocated lending on a broad range of collateral, including "Railway debenture stock." That lending on the security of government debt was thought of as the equivalent of discounting private bills is further evidence that the monetary implications were paramount for Bagehot.

After the Treasury-Fed Accord in 1951, the Federal Reserve exercised its newly won independence to buy and sell US Treasury securities as it saw fit. One can see echoes of the tension between Pitt and the Bank of England in the Fed's "even keel" policy of refraining from operations in the period around the Treasury's financing operations, which Allan Meltzer argues gave monetary policy an inflationary bias (Meltzer 2009; Consolvo et al. 2020). Nonetheless, post-Accord, acquiring US government securities, whether permanently or temporarily via repurchase agreements, became the routine and unexceptional method of expanding the Fed's monetary liabilities to accommodate increases in money demand, a fact highlighted by the open market purchases of August 9, 2007. For the modern

Fed, open market operations in Treasury securities are the natural way to fulfill the lender-of-last-resort role envisioned by Thornton and Bagehot.

12. Conclusion: How Did We Get Here?

Thorton and Bagehot saw the Bank of England as needing to expand note issue via *unsterilized* lending to accommodate a panic-induced surge in demand and stave off monetary contraction. While this role has come to be known as the lender of last resort, what the classical writers had in mind is more precisely described by the less euphonious phrase "monopoly monetary instrument supplier of last resort." And yet the idea of a traditional central banking lending role is invoked now to justify an array of central bank credit market interventions that go far beyond what these classical writers had in mind. How did this gulf come about?

Comparing the Bank of England of Thornton and Bagehot with the Federal Reserve of the past half-century suggests the importance of key differences in *governance*. The Bank of England was a for-profit banking franchise with legal privileges and an obligation to fund the government within the constitutional structure of British public finance—a structure erected in the wake of the Glorious Revolution to maintain the Crown's ability to credibly commit to debt repayment without debasement. Acquiring government obligations was thus politically sensitive for the Bank and only undertaken at the direction of Parliament. The Bank's discretion to lend as it saw fit was taken for granted, though, consistent with the exercise of the monopoly banking privileges granted in its founding charter. Moreover, early 19th-century governments preferred to impose responsibility for lending in crisis to the Bank of England rather than undertake the lending themselves through the issue of bills for the Bank to discount. Given those arrangements, it was natural for observers such as Thornton and Bagehot to equate the Bank's management of its note issue with the management of its private credit extension. The Bank's accountability to its shareholders aligned its incentives with maintaining adherence to the gold standard in the face of external imbalances but skewed its incentives during internal drains that threatened the fractional reserve banking system for which it was the pivot. The latter case provoked Bagehot's passionate argument that the Bank needed to acknowledge responsibility to act in the national interest.[73]

73. Forrest Capie (2002, 311–12) argues that the overlooked institutional structure through which the Bank of England lent—discount houses intermediating between the Bank and the commercial banks—also contributed to subsequent confusion about the meaning of last-resort lending. That institutional structure built in an anonymity that made the Bank's unsterilized lending functionally equivalent to open market operations; such anonymity was absent for other central banks.

For the Federal Reserve, incentives are skewed in the opposite direction. Depression Era restructuring made the Fed more responsive to the public interest, as mediated by the political system, and less responsive to the Reserve Banks' nominal shareholders, whose return is fixed by law. Open market purchases and sales of US government securities have been the conventional instrument of Federal Reserve monetary policy since the middle of the 20th century. The Fed's extension of credit to the private sector has been a frequent target of political pressure, both to constrict lending to disfavored borrowers, such as "Wall Street" banks, and to encourage off-budget lending to favored sectors, such as housing. Meanwhile, Congress and the administration seem happy to have the Fed circumvent an inconvenient constitutional appropriations process. While the Fed's discretionary lending authority was originally envisioned as its primary monetary policy tool, it has since become a vestigial appendage, made redundant by open market operations and on-budget federal credit programs (Lacker 2014, 2019). Yet the Fed's independence, crucial for monetary policy credibility, together with its political rather than pecuniary orientation, has made it difficult to sustain any commitment to lending boundaries. Sterilized lending to rescue investors in failing financial institutions has mitigated the short-run political risk of being blamed for financial market tumult, even when monetary stability is not in danger. But successive interventions beyond the scope of previous precedents set up ambiguous precedents that corroded financial-sector risk management and exacerbated fragility (Goodfriend and Lacker 1999). While the practice of central bank monetary policy "came of age" in the decades following the final transition to fiat money in 1971 (Goodfriend 1997) and ultimately established credibility for price stability, central bank credit policy seems less far along. Indeed, at this point, it is not at all clear whether the central bank credit policy is even headed in the direction of credibly committed limits.

Cloaking 21st-century central bank credit market intervention in the classical mystique of the lender of last resort has added a "gloss of conservative authority" on unprecedented interventions (Grant 2019, 294). In any event, the idea of the central bank as the lender of last resort, originally an admonishment to the Bank of England to act in accord with the public interest in monetary stability, seems to have lost its relevance to 21st-century central bank lending.

Data Appendix

Data used in this paper are from FRED (Federal Reserve Economic Data), an online database at the Federal Reserve Bank of St. Louis. Sources are as follows:

- Board of Governors of the Federal Reserve System (US), Assets: Liquidity and Credit Facilities: Loans: Primary Credit: Week Average [WPC], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/WPC, February 24, 2023.
- Board of Governors of the Federal Reserve System (US), Currency Component of M1 [CURRSL], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/CURRSL, September 21, 2023.
- Board of Governors of the Federal Reserve System (US), Demand Deposits [DEMDEPSL], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/DEMDEPSL, September 21, 2023.
- Board of Governors of the Federal Reserve System (US), M1 (DISCONTINUED) [M1], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/M1, March 31, 2023.
- Board of Governors of the Federal Reserve System (US), M2 [WM2NS], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/WM2NS, March 31, 2023.
- Board of Governors of the Federal Reserve System (US), Monetary Base; Total (DISCONTINUED) [BOGMBASEW], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/BOGMBASEW, March 31, 2023.
- Federal Reserve Bank of St. Louis, Excess Reserves of Depository Institutions (DISCONTINUED) [EXCSRESNW], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/EXCSRESNW, February 24, 2023.

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