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Working Paper No. 751

Arresting Financial Crises: The Fed versus the Classics

by

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ABSTRACT

Nineteenth-century British economists Henry Thornton and Walter Bagehot established the classical rules of behavior for a central bank, acting as lender of last resort, seeking to avert panics and crises: Lend freely (to temporarily illiquid but solvent borrowers only) against the security of sound collateral and at above-market, penalty interest rates. Deny aid to unsound, insolvent borrowers. Preannounce your commitment to lend freely in all future panics. Also lend for short periods only, and have a clear, simple, certain exit strategy. The purpose is to prevent bank runs and money-stock collapses—collapses that, by reducing spending and prices, will, in the face of downward inflexibility of nominal wages, produce falls in output and employment.

In the financial crisis of 2008–09 the Federal Reserve adhered to some of the classical rules—albeit using a credit-easing rather than a money stock–protection rationale—while deviating from others. Consistent with the classicals, the Fed filled the market with liquidity while lending to a wide variety of borrowers on an extended array of assets. But it departed from the classical prescription in charging subsidy rather than penalty rates, in lending against tarnished collateral and/or purchasing assets of questionable value, in bailing out insolvent borrowers, in extending its lending deadlines beyond intervals approved by classicals, and in failing both to precommit to avert all future crises and to articulate an unambiguous exit strategy. Given that classicals demonstrated that satiating panic-induced demands for cash are sufficient to end crises, the Fed might think of abandoning its costly and arguably inessential deviations from the classical model and, instead, return to it.

Keywords: Lender of Last Resort; Financial Crises; Bank Panics; Bank Runs; Bailouts; Penalty Rates; Collateral; High-powered Monetary Base; Broad Money Stock; Multiplier; Federal Reserve Policy; Liquidity; Insolvency; Emergency Lending; Credit Risk Spreads; Systemic Risks; Classical Economists

JEL Classifications: E44, E51, E58

The financial crisis of 2008–09 witnessed a resurgence of interest in central banks’ time-honored role as lenders of last resort (LLR) to the financial system in times of stress. Some have deemed the Federal Reserve’s massive response to the crisis—a response in which the Fed more than doubled the size of its balance sheet—“classical” in the sense of proceeding exactly as a traditional LLR should proceed. Typical is the opinion of Hubbard, Scott, and Thornton (2009) that “over many decades and especially in this financial crisis the Fed has used its balance sheet to be a classical lender of last resort.”

Others, however, have criticized the Fed as being anything but classical not only in exceeding traditional bounds in the magnitude of its balance sheet expansion, but also for rescuing unsound institutions rather than limiting its assistance to solvent but illiquid firms, for accepting worthless collateral in security for its loans, for charging subsidy rather than penalty loan interest rates, and for channeling aid to privileged borrowers rather than impartially to the market in general.

Unfortunately, use of the term “classical” in the description/evaluation of the Fed’s crisis-management policy is misleading. It conflates two different versions of the LLR, namely the Fed’s version and the standard 19th century British classical variant, as if they are one and the same when they are not. The truth of the matter is that while the Fed has adhered to some provisions of the classical version, it has deviated from others. These deviations, which the Fed sees as necessitated by financial sector developments unforeseen by classical writers, nevertheless create potential problems of their own, problems the classical version was designed to avoid.

The question, then, is whether the Fed might not contribute more to financial and macroeconomic stability by abandoning its departures from classical doctrine and instead return to it. In an effort to answer this question, the following paragraphs describe, analyze, and appraise the classical model and the Fed’s deviation from it.

CLASSICAL THEORY OF LENDER OF LAST RESORT POLICY

Classical LLR theory refers to the central bank’s duty to lend to solvent banks facing massive cash withdrawals when no other source of cash is available. Unlike today’s Fed, which sharply distinguishes monetary policy (whose task is to stabilize inflation and real activity around their target values) from LLR policy (whose purpose is averting crises), classicals viewed LLR policy

as part and parcel of the central bank's broader responsibility to protect the stock of bank-created money from contraction (and to expand it to compensate for falls in its circulation velocity). The central bank fulfills its money-protection function by precommitting to expanding the money stock (that is, to inject liquidity) without limit to accommodate panic-induced increases in the demand for money.

Such aggressive emergency monetary expansion is achieved either (1) through central bank discount-window lending without stint—albeit at a high interest rate so as to discourage overcautious and too frequent resort to the loan facility—to creditworthy, cash-strapped borrowers offering good collateral; or (2) through purchases of Treasury bills, bonds, and other assets either from the commercial banks themselves or on the open market. The goal is to prevent sharp, sudden falls in the money stock (and thus falls in spending and prices)—falls that, given downward inflexibility or stickiness of nominal wages, produce rises in real wages and corresponding declines in business profits, leading to falls in output and employment. Classical noted, however, that in conducting its operations, the LLR has no business bailing out unsound, insolvent banks. Its mission is to stop liquidity crises. Nevertheless, if the LLR acts swiftly, aggressively, and with sufficient resolve, it can prevent liquidity crises from deteriorating into insolvency ones. By creating new money upon demand for sound but temporarily illiquid banks, the LLR makes it unnecessary for those banks, in desperate attempts to raise cash, to dump assets at fire-sale prices that might render the banks insolvent.

The classical theory of the LLR's responsibility can be illustrated with the aid of an expanded version of Irving Fisher's celebrated equation of exchange

$$Bm(c, r)V = PQ$$

where B is the high-powered monetary base consisting of currency in circulation plus bank's cash reserves; $m(c, r)$ is the base multiplier, a decreasing function of both the public's desired currency-to-deposit ratio c and bankers' desired reserve-to-deposit ratio r ; V is the circulation velocity or annual rate of turnover of the broad money stock (the latter stock consisting of the multiplicative product Bm of the base times the multiplier; P is the general price level; Q the quantity of final goods and services produced per year—that is, the real domestic product; and PQ is total dollar domestic spending or nominal domestic product (Beckworth 2011).

Panics and bank runs are characterized by collapses in the base multiplier $m(c, r)$ as the public seeks to convert checking deposits into currency—raising c —while bankers seek to hold larger reserves against their deposit liabilities—raising r . Additionally, panics induce sharp falls

in velocity V as the public, in a flight to safety, endeavors to augment its holdings of money balances, seen as the safest liquid asset. In the absence of LLR assistance, the resulting falls in the multiplier m and velocity V will produce corresponding equivalent falls in total nominal spending PQ , which given nominal wage stickiness, translates largely into contractions in real output and employment.

To prevent this sequence from occurring, the classical LLR must, either through discount window lending or open market purchases, expand the monetary base B sufficient to offset plunges in the multiplier and velocity. In so doing, it keeps both sides of the equation unchanged at their pre-panic magnitudes and so maintains the level of total spending on its full-employment path.

HISTORY OF THE CLASSICAL CONCEPT: THE THORNTON-BAGEHOT MODEL

Sir Francis Baring, in his 1797 *Observations on the Establishment of the Bank of England*, was the first to use the term “lender of last resort” when he referred to the Bank as “the dernier resort” from which all commercial banks could obtain liquidity in times of stress. However, it was (1) the British banker, member of parliament, evangelical reformer, antislavery activist, and all-time great monetary theorist, Henry Thornton (1760–1815), and (2) the economic historian, financial writer, and long-time editor of the *Economist* magazine, Walter Bagehot (1826–77) who established ten bedrock principles or building blocks that together constitute the benchmark classical LLR model that continues to inform central bankers today—the former in his speeches on the Bullion Report, his parliamentary testimony, and his *An Inquiry Into the Nature and Effects of the Paper Credit of Great Britain* (1802) and the latter in his *Lombard Street: A Description of the Money Market* (1873). Of these ten principles, Thornton stressed six (items 1 through 6 below) pertaining to the macro or monetary aspects of LLR lending, while Bagehot emphasized four (items 7 through 10) referring to microeconomic aspects.¹ Although open-market operations were not widely used during Thornton’s and Bagehot’s time and so go unmentioned in the following ten propositions, those authors arguably would have approved of their application—as an alternative to discount window lending—as the most expeditious, efficient, impartial, and market-oriented means of supplying emergency liquidity.

¹ For documentation and quotations, see Humphrey (2010).

1. Distinctive Features

Thornton, especially, but Bagehot too, understood that a central bank's distinguishing feature as an LLR consists of its monopoly power to create unlimited amounts of high-powered money in the form of its own notes and deposits, items whose legal tender status and universal acceptance mark them as money of ultimate redemption and the equivalent of gold coin. Both writers also stressed another feature differentiating the LLR from the ordinary profit-maximizing commercial banker, namely its public responsibilities. Unlike the banker, whose duties extend only to his stockholders and customers, the LLR's responsibilities extend to the entire macroeconomy. This special responsibility dictates that the LLR behave precisely the opposite of the banker in times of stress, expanding its note and deposit issue and its loans at the very time the banker is contracting his. For, whereas the banker can justify his contraction on the grounds that it will enhance his own liquidity and safety while not materially worsening that of others, the LLR must assume that because of its influence over the money supply, any contractionary policy on its part will adversely affect the whole economy. Consequently, it must expand its operations during panics at the very time the banker is contracting his.

2. Money-stock Protection Function

Thornton saw the central bank's LLR duty predominantly as a monetary function, rather than a banking or a credit function. True, the LLR acts to forestall bank runs and avert credit crises. However, these actions, although critically important, are not the end goal of policy in and of themselves. Rather, they are ancillary and incidental to the LLR's main task of protecting the money supply. In short, the LLR's crisis-averting and run-arresting duties are simply the means, albeit the most efficient and expeditious means, through which it pursues its ultimate objective of preserving the quantity, and hence purchasing power, of the money stock. The crucial objective is to prevent sharp, sudden short-run shrinkages in the quantity of money, since hardship ensues from these contractions rather than from bank runs or credit crises, per se.

3. Credit vs. Money

It follows that the LLR must draw a sharp distinction between the asset, or credit (loans and discounts) side, and the liability, or money (notes and deposits) side of bank balance sheets. Although the two aggregates, bank credit and bank money, tend to move together, it is panic-induced falls in the latter rather than the former that render damage to the real economy. The

reason is straightforward: Money does what credit cannot do, namely serve as the economy's unit of account and means of exchange. Because money forms the transaction medium of final settlement, it follows that its contraction, rather than credit crunches and collapses, is the root cause of lapses in real activity. In Thornton's (1802, p. 307) own words, "it is not the limitation of Discounts and Loans, but the limitation of Bank Notes or the Means of Circulation that produces the Mischiefs" of lost output and employment.

4. Monetary Transmission Mechanism

Motivating the classical's rationale for an LLR was their understanding of how panic-induced monetary contraction and the consequent fall in output can occur in the absence of preventive action. Here Thornton, in particular, traced a causal connective chain running from an initial shock—for example, a rumor or alarm of a bank failure or an invasion by foreign troops—to a financial panic, thence to a flight-to-safety demand for base or high-powered money, thence to the broad money stock itself, and finally to the level of real activity.

In Thornton's version of the transmission mechanism, the panic triggers doubts about the solvency of banks and the safety of their note and deposit liabilities. Anxious deposit and note holders then seek to convert these items into money of unquestioned soundness, namely gold coin and its equivalent, the central bank's own note and deposit liabilities. These items, whether circulating as currency or held in bank reserves, comprise the high-powered monetary base, unaccommodated increases in the demand for which in a fractional reserve banking system are capable of causing multiple contractions of the money stock.

Thornton noted that panics cause the demand for base money to become doubly augmented. For, at the same time that commercial bank customers are attempting to convert suspect bank notes and deposits into coin and central bank notes and deposits, bankers are seeking to augment their reserves of these high-powered monetary assets, both to meet anticipated cash withdrawals and to allay public suspicion of their financial weakness. The result is a sudden increase in the demand for base money, which, if not accommodated by increased issues of it, produces in a fractional reserve banking system sharp contractions in the money stock and equally sharp contractions in spending and prices. Because nominal wages (and other resource-input costs) are downwardly sticky and therefore respond sluggishly to declines in spending and prices, such declines tend to raise real wages and other real costs, thereby reducing profits and so inducing producers to slacken production and lay off workers.

The upshot is that output and employment bear most of the burden of adjustment, and the impact of monetary contraction falls on real activity. Or, as Thornton (1802, pp. 118–19) himself put it, money-stock contraction and the resulting “diminution in the price of manufactures” will “occasion much discouragement of the fabrication of manufactures” and “suspension of the labor of those who fabricate them”—all because the price fall is “attended ... with no correspondent fall in the rate or wages,” which is “not so variable as the price of goods.”

5. Avoiding Contraction/Deflation/Recession

To prevent this sequence of events, the LLR must stand ready to accommodate all panic-induced increases in the demand for high-powered money, demands that it can readily satisfy by virtue of its open-ended capacity to create base money in the form of its own notes and deposits. Expressed in modern terminology, Thornton’s conception of the LLR’s job was this: Define *cash* as gold coin plus the LLR’s own note and deposit liabilities in circulation. Likewise, define the *money stock* as the sum of such cash plus the deposit and note liabilities of commercial banks. Then, the LLR must be prepared to offset falls in the base multiplier arising from panic-induced hikes in the public’s cash-to-banknote-and-deposit ratio and in the banks’ reserve-to-banknote-and-deposit ratio with compensating increases in the monetary base. By so doing, the LLR maintains the quantity and purchasing power of money—and so the level of economic activity—on their stable, full-employment paths.

6. Countering Velocity Falls

Thornton saw a complicating factor: The LLR must realize that panics induce falls not only in the base multiplier, but also in money’s circulation velocity due to a flight to safety and corresponding rises in the public’s precautionary demand for cash. For, says Thornton (1802, pp. 97–8), when “a season of distrust arises, prudence suggests that the loss of interest arising from the detention of notes for a few additional days should not be regarded. Every one fearing lest he should not have his notes ready when the day of payment should come, would endeavor to provide himself with them beforehand.” The result is “to cause the same quantity of bank paper to transact fewer payments, or, in other words, to lessen the rapidity of the circulation of notes on the whole, and thus to increase the number of notes wanted.”

In this case, the LLR cannot be content merely to maintain the size of the money stock. It must expand that stock to offset the fall in velocity if it intends to stabilize prices and real activity. Here, the LLR counters fall both in the base multiplier and in velocity with compensating rises in the base. True, the base and the stock of money will be pushed above their stable non-inflationary long-run paths. But they will quickly revert to those paths when the panic ends, velocity returns to its normal level, and the LLR withdraws the excess money. In short, deviations from path are short-lived and minimal if the LLR promptly does its job. There need not be conflict between LLR policy and stable money policy.

7. Eligible Borrowers and Acceptable Collateral

To the foregoing propositions Bagehot added several more. He specified that the LLR must be prepared to lend to all sound but temporarily illiquid borrowers offering good security of any kind. By accepting good collateral—commonly pledged and easily convertible assets deemed safe security in ordinary times—from any source whatsoever, the LLR avoids favoritism and the channeling of aid to privileged borrowers. And by placing few restrictions on the types of assets on which it lends, always provided those assets are sound, the LLR eschews qualitative constraints—eligibility rules, administrative discretion, “direct pressure,” moral suasion, and the like—incompatible with market-oriented liquidity allocation mechanisms.

Bagehot’s sound-collateral provision has other advantages. It provides a rough-and-ready test of the borrower’s solvency when other timely proof is unavailable. And provided the market value of the collateral exceeds the principal of the loan by a considerable margin, the resulting “haircut” insures the LLR (and ultimately the taxpayer) against loss should the borrower default and the assets be liquidated to recover the proceeds of the loan plus accrued interest.

8. Unsound (Insolvent) Institutions

Bagehot insisted that the LLR has no duty to bail out unsound banks, no matter how big or interconnected. Such bailouts produce moral hazard. They encourage other banks to take excessive risks under the expectation that the LLR will rescue them if their risks turn sour. Too big to fail is not an automatic justification for aid. All such banks, if insolvent, should be denied LLR assistance and be allowed to expire.

Such observations, though usually attributed to Bagehot, were enunciated by Thornton more than seventy years before. Thus, Thornton (1802, p.188) writes:

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 [that is, non-London commercial] banks bring upon them; the bank, by doing this, might encourage their improvidence. . . . [R]elief should neither be so prompt and liberal as to exempt those who misconduct their business from all the natural consequences of their fault, nor so scanty and slow as deeply to involve the general interests. These interests, nevertheless, are sure to be pleaded by every distressed person whose affairs are large, however indifferent and ruinous may be their state.

In such cases, the LLR's duty extends solely to solvent, illiquid banks. Averting liquidity crises, not insolvency ones, is its mission. Nevertheless, its injections of liquidity can help temporarily cash-strapped banks avoid insolvency arising from the necessity of raising cash through sales of assets at fire-sale prices, prices that by lowering net worth into negative territory would render banks insolvent. But the general principle stands: Although failure of a large unsound bank can trigger a panic, the LLR's task is not to stop this triggering event. Instead, its job is to engineer massive liquidity injections that prevent failure from spreading to the sound banks of the system. The LLR exists not to stop initial shocks, impossible in many cases anyway, but to block their secondary repercussions.

9. High (Penalty) Rate

Bagehot's most celebrated rule is that the LLR should charge an above-market or penalty interest rate for its accommodation.² The rate should be high enough to discourage (1) unnecessary and too-frequent recourse to the discount window, and (2) overcautious hoarding of scarce cash—yet not so high as to bankrupt sound borrowers (already unsound or insolvent banks may decide not to apply on grounds that the high rate indeed will bankrupt them.)

The high rate has the advantage of encouraging retention of the gold component of the monetary base at home as well as attracting additions to that stock from abroad. The high rate does so by inducing net foreign short-term capital inflows through the balance of payments, and by exerting a restraining pressure on domestic spending that both frees up goods for export and checks imports, thereby improving the balance of trade. And the high rate rations liquidity to its highest valued uses just as a high price rations any scarce commodity or service in a free

² Note, however, that Laidler (2012, p. 14) questions whether Bagehot really thought of the high rate as a penalty rate and whether he distinguished sharply between illiquid and insolvent borrowers.

market. The high rate also appeals to distributive justice, it being only fair that borrowers pay handsomely for the protection and security offered by the LLR. And consistent with the LLR's post-crisis exit strategy of extinguishing excess liquidity and so restoring the money stock to its stable noninflationary path, the high rate encourages prompt repayment of loans—and removal from circulation of the money used to pay them—at panic's end. Finally, the higher-than-market rate also gives would-be borrowers an incentive to exhaust all market sources of liquidity and to develop new sources before coming to the discount window such that resort to the latter is truly a last resort. This means that sound institutions, many of whom can borrow at the lower market rate, are less likely to resort to the LLR's facility than are unsound ones who face credit risk premia in excess of the penalty rate-market rate differential. In this way, the penalty rate may serve as a partial test of borrower soundness.

10. Pre-announced Commitment

Bagehot emphasized that not only must the LLR act promptly, vigorously, and decisively so as to erase all doubt about its determination to forestall current panics, it must also pre-announce its commitment to lend freely in all future panics. Such precommitment dispels uncertainty and promotes full confidence in the LLR's willingness to act. It generates a pattern of stabilizing expectations that help prevent future crises: Confident that the LLR will deliver on its commitment, the public will not run on the banks, thus obviating the need to create emergency liquidity.

THE FED AND THE THORNTON-BAGEHOT MODEL: POINTS OF AGREEMENT AND DISAGREEMENT

The Federal Reserve System was established in 1914 partly to serve as an LLR for the US banking system. But its post-1914 LLR performance has been uneven at best, honoring the canonical Thornton-Bagehot model as often in the breach as in the observance.

In the early 1930s, the Fed famously failed to accommodate panic-driven increases in the demand for high-powered money. The result was a wave of bank failures and a 33-percent contraction of the money stock, a contraction that, according to Friedman and Schwartz's (1963) *A Monetary History of the United States, 1867–1960*, contributed materially to the Great Depression's massive and protracted fall in output and employment. Since then, the Fed

occasionally has abided by the classical model, as when it provided emergency liquidity in the wake of the October 1987 stock market crash and before Y2K and after 9/11.

Most recently, in the financial crisis of 2008–09, the Fed adhered to some classical principles, while it departed from others (Humphrey 2010). Consistent with the classical model, it injected abundant amounts of liquidity into the banking system. These injections were sufficient to resolve the crisis (but insufficient to prevent the recession accompanying and following it or to boost the weak recovery). And consistent with Bagehot's advice to lend to every conceivable borrower on a wide range of security, provided it is sound, the Fed accommodated banks, non-financial firms, investment banks, money market mutual funds, and primary security dealers, all the while lending against such unconventional collateral as mortgage-backed securities, asset-backed commercial paper, consumer and business loans, and debt of government sponsored enterprises (GSEs). What was inconsistent with Bagehot's advice, however, was that much of this collateral was complex, opaque, hard-to-value, illiquid, difficult to buy and sell, risky, and liable to default—hardly good security. The Fed also purchased outright from banks and other financial institutions assets such as commercial paper, securities backed by credit cards, student loans, auto loans, and other assets, and mortgage-backed securities and debts of GSEs. Finally, it guaranteed debt of Citigroup and extended loans to insurance giant AIG—both of them insolvent firms deemed too big and too interconnected to fail. In conducting these actions, all in the name of the LLR, the Fed violated the classical model in at least six ways.

Emphasis on Credit Instead of Money

First was the Fed's shift of focus from money to credit. To classical writers, especially Thornton, injections of base money to protect the broad money stock from contraction were the essence of LLR operations. To Fed policymakers in 2008–09, however, base expansion, despite occurring on a grand scale, was not the intended goal of LLR operations. Instead, those operations were aimed at unblocking seized-up credit markets, lowering credit risk spreads, and getting banks to lend to each other on the interbank market again. Thus, Fed Chairman Ben Bernanke in June 2009 denied that the Fed's doubling of the base was a policy of quantitative easing designed to protect or increase the money stock. Rather, it was an incidental side effect of a credit easing policy designed to shrink credit risk spreads and free up frozen credit markets.

Bernanke's concern with credit stems from his early research suggesting that it was bank failures and the resulting drying-up of credit availability (and destruction of specialized knowledge and fragile banker-borrower relationships) as much as it was monetary contraction that caused the Great Depression of the 1930s. This finding quickly crystallized into the proposition that bank lending, because it finances capital investment expenditure as well as purchases of labor and raw material inputs, is the key variable, independent of money, driving spending (Congdon 2011, pp. 389–92).

Bernanke's lending-drives-spending proposition differs from the traditional money-determines-spending, cash-balance mechanism of the classicals. Classical held that if faulty LLR policy allowed the money stock to shrink so that it fell short of money demand, the resulting excess demand for money would lead agents to cut spending on goods and services and to hoard the proceeds in an effort to rebuild their cash balances and eliminate the monetary shortfall. The reduced spending would cause prices and, given sticky nominal wages, employment, output, and income to fall until cash holders were just content to hold the reduced money stock such that the excess money demand vanished. Applying their analysis to the Great Recession that overlapped the recent financial crisis, classicals would note that the Fed, whose doubling of the base almost precisely offset a halving of the multiplier as required to alleviate the crisis, nevertheless failed to expand the base additionally to counter falls in velocity. Consequently, money supply fell short of money demand, causing prices and real activity to fall in the recession of 2007–09.

To this day, however, conjectures regarding the drying up of credit availability and its impact on real output remain largely unsubstantiated. No proof exists that credit availability is so tenuous and credit relationships so fragile—and therefore worthy of LLR protection—as to be lost forever if unsound banks are allowed to fail and to pass into recapitalization or resolution. Likewise, no proof exists that the unclogging of obstructed credit channels is superior to a policy of maintaining the quantity of money intact (or increasing that quantity to match rises in money demand) in order to stabilize real activity in the face of temporary shocks and panics. On the contrary, the evidence supports the opposite notion that the link between money and spending is more solid and dependable than the link between bank lending and spending (Congdon 2011, pp. 402–4). Indeed, the evidence is that money drives spending even if lending is unchanged or moving opposite to money (although, normally, they tend to move together). Historically and statistically, the money view trumps the credit view.

Taking Junk Collateral

The Fed's second departure from the classical model came when it violated Bagehot's advice to advance only on sound security and, instead, accepted questionable, hard-to-value collateral. (The same was true of its purchases of toxic paper.) By taking such tarnished security upon which it could ultimately lose, the Fed put itself and taxpayers at risk. Should the collateral and/or the purchased assets fall in value and the Fed incur losses on them, such losses would reduce the seigniorage earnings the Fed remits to the Treasury, forcing the latter to raise taxes and/or issue additional debt to cover its given revenue needs. By influencing the Treasury's tax bill and debt issuance, the Fed in effect would become a fiscal and debt-management policymaker when it was designed to operate solely as a monetary agency. A related problem is that open market sales of the Fed's devalued tarnished assets might yield insufficient proceeds whose retirement from circulation extinguishes excess liquidity at crisis's end.

Charging Subsidy Rates

Third, the Fed deviated from Bagehot's instruction to charge penalty interest rates. Instead, it accommodated AIG and other borrowers at below-market or subsidy rates. For example, it charged AIG rates of 8.5 to 12 percent at a time when junk bonds of the same degraded quality as AIG's assets were yielding 17 percent or more. True, on many of its other last-resort loans, the Fed, in a bow to Bagehot, charged rates of 100 (later lowered to 25) basis points above its federal funds rate target. But because the Fed already had lowered the target rate to near zero, the resulting loan rates ranged from approximately $\frac{1}{4}$ percent to 1 percent, hardly penalty rates in Bagehot's sense of the term.³

Finally, on still other of its last resort loans, the Fed charged no differential penalty rate whatsoever (Madigan 2009). Charging below-market subsidy rates violates the classical ideal of impartiality in LLR lending, and channels credit not to its highest and best uses as the market tends to do, but rather to politically favored recipients. The same inefficient and suboptimal allocation of credit occurs when the Fed purchases tarnished assets from selected preferred sellers.

³ Congdon (2009, p. 96), however, argues that the penalty should be no more than 100 basis points. So $\frac{1}{4}$ percent to 1 percent fills the bill.

Rescuing Unsound Firms Too Big To Fail

Fourth, the Fed ignored the classical admonition never to accommodate unsound borrowers when it bailed out insolvent banks Citigroup and AIG. Judging each firm too big and too interconnected to fail, the Fed argued that it had no choice but to aid in their rescue since each formed the hub of a vast network of counterparty credit interrelationships vital to the financial markets, such that the failure of either firm would have brought collapse of the entire financial system. Fed policymakers neglected to notice that Bagehot already had examined this argument and had shown that interconnectedness of debtor-creditor relationships and the associated danger of systemic failure constituted no good reason to bail out insolvent firms. Modern bailout critics take Bagehot one step further, contending that insolvent firms *should* be allowed to fail and go through receivership, recapitalization, and reorganization. Although assets will be “marked to market” and revalued to their natural equilibrium levels, nothing real will be lost. The firms’s capital and labor resources, as well as their business relationships and specific information on borrowers, will still be in place to be put to more effective and less risky uses by their new owners.

Extension of Loan Repayment Schedules

Fifth, the Fed violated maturity constraints that classical analysts placed on LLR loans. Those analysts saw LLR assistance as a temporary emergency expedient that, when successful, ended panics swiftly, and therefore needed to last a few days only or weeks at most: LLR loans resolved panics promptly and were to be repaid immediately upon their end.⁴

The 2008–09 Fed, by contrast, prolonged repayment deadlines beyond the limit set by the classical prescription. Thus, the Fed’s Term Auction Facility (TAF) loans carried 28- and 84-day repayment maturities, while its initial loan to AIG remained outstanding for almost two months. To the extent that these loans were financed by base money creation, their prolonged maturity could have delayed unduly the return of the base to its long-run non-inflationary path. And to the extent they were financed by credit creation—that is, by purely compositional shifts in the Fed’s balance sheet to accommodate targeted borrowers—they were subject to borrower default, Fed losses, and reduced remission of seigniorage revenues to the Treasury, all of which put taxpayers at risk for protracted periods of time.

⁴ Congdon (2009, pp. 100–01) disagrees, arguing that LLR loans must last as long as it takes—perhaps years, not weeks—for borrowing banks to wind up their affairs and repay depositors in full. He sees maximization of the value of borrowing banks’ assets, not quick repayment of LLR loans, as the proper objective.

No Pre-announced Commitment

The sixth deviation from the classical doctrine was the Fed's failure to specify and announce a consistent LLR policy in advance of all future crises so that market participants could form stabilizing expectations vital to ending crises. Indeed, Allan Meltzer (2009, p. 29) notes that in its entire history the Fed has never articulated a consistent, well-defined LLR policy, much less a pre-announced one. Sometimes, as with AIG, it has rescued insolvent firms. At other times, as with Lehman Brothers, it has let them fail. On still other occasions, as with the arranged JPMorgan-Chase absorption of Bear Stearns, it has devised other solutions. In no case has it spelled out beforehand its underlying rationale. In no case has it stated the criteria and indicators that trigger its decisions, nor promised that it would rely on the same triggers in all future crises. The lack of a clearly laid out commitment confuses market participants and generates uncertainty. It is counterproductive to quelling panics and crises.

No Clear Exit Strategy

The Fed's failure to articulate an exit strategy to remove or neutralize the high-powered money created as a by-product of its credit-easing policies constitutes the seventh deviation from the classical model.⁵ Classical LLR theorists Thornton and Bagehot offered an exit strategy to eradicate excess liquidity at crisis's end that was at once simple, clear, certain, and automatic. Either no action was required (as when credible precommitment forestalled panics and runs before they began, or the penalty rate eliminated monetary overhang by spurring borrowers to repay costly last-resort loans with money that the central bank then impounded and retired from circulation. Should borrowers fail to repay their loans, the central bank still could wipe out any remaining overhang by selling the collateral securing those loans and retiring the monetary proceeds.

Such outcomes, however, were largely unavailable in the crisis of 2008–09 given the Fed's failure (1) to precommit, (2) to charge high penalty rates on all its loans, and (3) to accept only collateral whose market value was at least equal to that of the loans it secured. True, Chairman Bernanke (2009) described new tools including the raising of interest rates paid on excess reserves (so that banks would hoard those reserves rather than lending them out in the form of newly created money) designed to mop up or immobilize the expanded monetary base

⁵ Contrariwise, Congdon (2009, p. 101) holds that exit from an LLR program is never clear in advance and indeed cannot be defined.

when the crisis ended and recovery began. But Bernanke never specified the conditions or indicators that would trigger application of these tools. The result has been to fan fears that the tools would be applied either too late to prevent inflation after the crisis was over, or too early, thereby prolonging the crisis and aborting the recovery.

CONCLUDING COMMENTS

Classical economists Thornton and Bagehot demonstrated that their proposed LLR policy—namely filling the economy with emergency injections of liquidity (albeit at high interest rates) so as to satiate panic-induced increased demands for cash—were capable of stabilizing the money stock (and expanding it when necessary to counter falls in velocity) in the face of shocks to the system. Provided the LLR refrained from measures (such as paying interest on excess reserves) that might inhibit free circulation of the extra liquidity, its operations ensured that despite the shocks, all money demands would be accommodated. The resulting equilibration of money supply and demand, besides stilling the panic, guaranteed that the economy's full capacity level of payments could be consummated and its transactions, both financial and real, could be settled smoothly.⁶

The Fed, albeit using a credit-easing rather than a monetary-easing rationale, fulfilled the crucial LLR function of providing sufficient liquidity to resolve the 2008–09 crisis (although not the recession and stagnant recovery following hard upon it). In this respect, the Fed conformed to the classical prescription and behaved as a classical LLR. At the same time, however, the Fed diverged from the classical model in extending assistance to insolvent too-big-to-fail firms at below-market interest rates on junk collateral. Our review of these and other initiatives (including the Fed's unwillingness to precommit to ending future crises and to enunciate an exit strategy) indicate that they were hardly benign. Instead, they generated uncertainty, inefficiency, and moral hazard, not to mention risks of potential losses to the Fed and the taxpayer, all without compensating benefits.

All of which suggests that the Fed might consider abandoning its new initiatives and scaling back its operations to the limited classical prescription of pre-announced lending to

⁶ Laidler (2012, p. 19) contends that classicals saw the LLR's overriding duty as that of keeping the monetary and financial system functioning, and doing whatever necessary to accomplish that objective. True enough, but classicals also understood that because money is at once the economy's unit of account, means of exchange, and safest asset during panics, stabilizing it would go a long way toward stabilizing the monetary and financial sectors as well. Monetary stabilization in the classical view is necessary and sufficient for financial stabilization.

sound borrowers on good security and/or liquidity provision via open-market operations to the market in general. Moreover, the Fed should emphasize and advertise its crisis-management goal as that of protecting and stabilizing the money stock and therefore the price level, the payments mechanism, the financial sector, and the level of real activity, as well. Since credible promises of prompt and vigorous emergency monetary expansion, per se, constitute the essential consideration here, it follows that the classical LLR model may require little modification. In sum, the classical medicine seems powerful enough to handle crises and bank runs, including traditional depositor runs as well as newer runs of banks and investors on the so-called shadow banking system composed of investment banks, money market funds, hedge funds, special purpose vehicles, and the like. If so, the classical LLR prescription is all it takes to stop crises, and the Fed's departures from that prescription may be superfluous. Returning to the classical model would also be consistent with the traditional strict assignment of monetary tasks to the central bank and fiscal tasks to the Treasury.

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