

LENDER OF LAST RESORT:
WHAT IT IS, WHENCE IT CAME,
AND WHY THE FED ISN'T IT
Thomas M. Humphrey

It has become commonplace in the current crisis to refer to the Federal Reserve as the economy's lender of last resort (LLR). Typical is the observation of Glenn Hubbard, Hal Scott, and John 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."

With all due respect to these authors and numerous others holding the same view, their statement is wrong. For while there exists such an entity as the classical lender of last resort—the traditional, standard LLR model, to be exact—the Fed has rarely adhered to it. And in the current crisis, the Fed has deviated from the classical model in so many ways as to make a mockery of the notion that it is an LLR. In short, the Fed may be many things, crisis manager included. But it is not an LLR in the traditional sense of that term.

True, Fed spokesmen pay lip service to the classical prescription, all the while thinking that they can outperform it with additional intervention. They believe that while the classical theory of LLR policy is valid as far as it goes, it doesn't go far enough to solve current financial and credit market problems. To this end, the Fed has ambitiously extended the role of the LLR so far beyond what classical

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writers would have recognized and approved as to disqualify itself as an authentic classical LLR.

The question is whether this expansion has been necessary or correct. Could it be that the Fed's recent deviations from the classical doctrine have been more harmful than helpful? Could it be that they are based upon fallacious or unproved conjectures and assumptions about how credit markets work that have led the Fed astray? Might the Fed contribute more to macroeconomic stability by abandoning its ambitious new initiatives and instead returning to the classical model? This article addresses these issues by describing, analyzing, and appraising both classical theory and the Fed's departures from it.

Architects of the Classical Theory

Classical lender-of-last-resort theory is the notion that the LLR should protect the bank-created money stock from contraction (and expand it to offset falls in velocity) in the face of bank runs and panics, a duty it performs through pre-announced lending, at a penalty interest rate so as to minimize moral hazard, to creditworthy borrowers offering good collateral. This theory was essentially the product of two Englishmen.

The first was Henry Thornton (1760–1815), banker, Member of Parliament, evangelical reformer, and all-time great monetary theorist, who developed his doctrine at the beginning of the 19th century when the British government had temporarily suspended gold convertibility of the Bank of England's currency during the Napoleonic Wars. Freedom from the obligation to make cash payments gave the Bank some discretionary control over the money stock and room to maneuver as an LLR. When the Bank proved reluctant to use these powers, Thornton sought to convince it to do otherwise.

The theory's second architect was Walter Bagehot (1826–77), economic historian, financial writer, and longtime editor of *The Economist*, who wrote in the 1850s, '60s, and '70s when the Bank of England had resumed convertibility and as an LLR was forced to operate within the constraints of the gold standard. Bagehot's genius was to show precisely how and why it should do so. Although others contributed to the classical theory, the Thornton-Bagehot (T-B) version was the one bequeathed to central bankers. Even though no gold standard now functions as a basic monetary institution, the T-B

model is today the benchmark policy for the Federal Reserve or any other central bank.

Henry Thornton's Contribution

The term “lender of last resort” originates with Sir Francis Baring, who in his *Observations on the Establishment of the Bank of England* (1797) referred to the Bank as “the dernier resort” from which all banks could obtain liquidity in times of crisis. But the concept itself received its first—and in many respects still the most complete and systematic—treatment in the work of Henry Thornton. It was Thornton who, in his testimony before Parliament, in his speeches on the Bullion Report, and in his classic *An Enquiry Into the Nature and Effects of the Paper Credit of Great Britain* (1802) identified the Bank of England's distinguishing characteristics as an LLR. It was he who specified the LLR's primary duty, who distinguished between the micro and macroeconomic aspects of this duty, and who analyzed the LLR's place in the monetary control function of the central bank. Finally, it was Thornton who first enunciated the moral hazard problem confronting the LLR.

Distinctive Features

Thornton identified three distinguishing characteristics of the LLR. First was its unique position as the ultimate source of liquidity for the financial system. The Bank as LLR maintained and managed a strategic stock of high-powered money that could be used to satisfy demands for liquidity at critical times. More precisely, the Bank of England held the central gold reserve from which all banks could draw. Equally important, it supplied the non-gold component of the monetary base in the form of its own notes, that—by virtue of their unquestioned soundness and unanimous acceptance in final payments—were considered the equivalent of gold and therefore constituted money of ultimate redemption. The Bank's effective monopolistic power to issue these notes gave it sole control over an open-ended source of high-powered money, the first requisite of an LLR.

Arresting Internal Drains

The second hallmark of the Bank as LLR was its special responsibilities as custodian of the central gold reserve. First, it had to hold

sufficient reserves to inspire full confidence in their ready availability in times of stress. Second, it had to rely upon its own resources to protect the reserve from gold-depleting specie drains. Specifically, it had to stand ready to freely issue its own paper to stem the panics that produce internal drains, as cash-holders sought to switch out of country bank notes into gold or its equivalent. And, while preventing external drains by avoiding persistent inflationary overissue of paper money that cause them, the LLR had to hold a large enough gold reserve to withstand those temporary and self-reversing external drains caused by real shocks to the balance of payments. Should the Bank nevertheless find its gold reserve depleted by an extraordinary succession of such shocks (Thornton mentions two successive crop failures) it had take steps to ensure that the eventual return flow of gold was not delayed by domestic monetary contractions that would depress aggregate production and reduce output available for export. For, according to Thornton (1802: 118), given downward inflexibility of nominal wages in the face of a money stock collapse,

the manufacturer, on account of the unusual scarcity of money, may even . . . be absolutely compelled by necessity to slacken, if not suspend, his operations. To inflict such a pressure on the mercantile world as necessarily causes an intermission of manufacturing labor, is obviously not the way to increase that exportable produce, by the excess of which, above the imported articles, gold is to be brought into the country.

The upshot is that the central bank must ensure that secondary monetary shocks do not prolong temporary external drains originating in real disturbances. To do so, it must sterilize or neutralize those drains with temporary increases in its own note issue. In so doing, it maintains the quantity of high-powered money and prevents sharp contractions in the money stock, contractions that, by depressing manufacturing activity and thereby reducing output available for export, would prolong the trade deficit and hinder the return flow of gold. By judicious expansion of its own paper, the Bank of England arrests and reverses these specie drains that imperil its gold reserve.

Public Duties

The third characteristic of the LLR is that it is not like just any other bank; it has public responsibilities. Unlike an ordinary profit-

maximizing commercial banker, whose responsibilities extend only to his stockholders and his customers, an LLR's responsibility extends to the entire economy. The LLR's duties include preserving the aggregate quantity, and hence purchasing power, of the circulating medium during bank runs and panics, and assisting the entire financial system in times of crisis. This responsibility dictates that the LLR behave precisely the opposite of a commercial banker in times of general distress, expanding its note issue and loans at the very time the banker is contracting his. For whereas the individual banker can justify his loan and note contraction on the grounds that it will enhance his own liquidity and safety while not materially worsening that of the whole economy, the LLR can make no such assumption. On the contrary, the LLR must assume that, because of its influence over the total money supply, any contraction policy on its part would adversely affect the economy. Consequently, the LLR must expand its note issue and loans at a time when the prudent commercial banker is contracting his.

Policy Issues

Having outlined the distinctive features of the LLR, Thornton next expounded on four policy issues pertaining to the LLR. The first concerns a possible conflict between the central bank's responsibility as controller of the paper component of the money stock and its function as an LLR. Since the central bank bears the responsibility for providing a stable framework of monetary growth, it must exercise a moderate and continued restraint on the rate of expansion of its own note issue. It must do so either (1) to protect its gold reserves from displacement by excess issues of paper so that it can maintain the gold convertibility of its currency under a regime of fixed exchange rates, or (2) to prevent domestic inflation under a regime of floating exchange rates. But coping with unusual liquidity drains or panics through exercise of the LLR function calls for abandonment of this restraint and relaxing control over the growth rate of the Bank note component of the monetary base. Here is an apparent conflict between these two central banking objectives.

Monetary Control and the LLR

Thornton, however, saw no inconsistency between a policy of stable monetary growth and the actions required to deal with liquidity

crises. In the following passage, which Joseph Schumpeter called the “Magna Carta of central banking,” Thornton distinguishes between the long-run non-inflationary, non-deflationary target growth path of paper money and temporary emergency deviations from that path. The proper policy of the Bank of England, Thornton (1802: 259) writes, is

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, increase in the event of any extraordinary alarm or difficulty, as the best means of preventing a great demand at home for guineas [a gold coin worth £1.05]; and to lean on 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.

Remedies for External Drains

Hence, to Thornton, the main responsibility of the central bank was to regulate paper money so that it expands at a steady non-inflationary pace roughly comparable to the long-term growth rate of output. The Bank must also counter those specie drains that periodically threaten to deplete its gold reserve and force suspension of convertibility. As previously mentioned, these drains were of two types: external (or foreign), composed of exports of gold to cover an adverse balance of payments, and internal (or domestic), consisting of panic-induced increases in the quantity of gold coin held outside the banking system by domestic residents. Temporary or self-reversing external drains arising from transitory real shocks to the balance of payments can normally be met from the large buffer stock of gold reserves held precisely for that purpose, the temporary runoff of gold being offset by a reverse flow later on. But an extraordinary succession of such drains, if sufficient to exhaust the metallic reserve and

deplete the gold in circulation, may require expansionary policy. Such policy, Thornton argued, would, by replacing gold with its Bank note equivalent, neutralize, or sterilize, the gold outflow, prevent needless monetary contraction and the resulting disruption of the export industries—"those sources of our returning wealth"—and thereby contribute to the prompt correction of the trade deficit and the speedy return of gold. By contrast, *persistent* external drains arising from inflationary overissue of paper call for restrictive policy: This policy, by reducing the inflated British money stock relative to the demand for it, creates an excess demand for money which agents attempt to satisfy by selling more goods (including exports) and buying fewer goods (including imports) until prices fall to the point where excess demand for money disappears. In this way restrictive policy lowers domestic prices relative to foreign prices, spurs exports, checks imports, eliminates the trade balance deficit, and halts the outflow of gold. Clearly, monetary contraction, not expansion, is the correct remedy for persistent external drains.

LLR and Internal Drains

In the case of a panic and internal drain, however, the Bank must be prepared temporarily to expand sharply both its note issues and its loans in order to satisfy the public's demand for high-powered money, meaning that the Bank must abandon temporarily its path of stable note growth to prevent the money stock from shrinking. Indeed, Thornton argued that emergency expansions of Bank of England notes were required to keep the entire stock of paper money (Bank notes plus notes issued by country banks) on path in the face of panic-induced demands to switch out-of-country notes into gold or its equivalent. These functions of monetary control and LLR were not in conflict, however, since the first refers to medium-to-long-run intervals whereas the second applied only to temporary periods of emergency that might last for only a few days. If the LLR responds promptly and vigorously to the threat of a liquidity crisis, the panic will be averted quickly. Indeed, Thornton held that the mere expectations of bankers, financiers, depositors, and note-holders to such a response would be sufficient to stay the panic before the Bank issued additional notes. In either case, the deviation of the paper component of the monetary base from its long-run target path would be small, both in magnitude and duration.

Macro versus Micro Responsibilities

The second issue considered by Thornton concerned the extent of the LLR's responsibility to individual banks as opposed to the banking system as a whole. Suppose some individual banks are unsound. Must the LLR act to prevent their failure? Are bailout operations necessary to preserve the stability of the payments mechanism? Thornton (1802: 188) answered in the negative.

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 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. The relief 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 or even ruinous may be their state.

Thornton made four key points in this passage. First, the LLR's primary responsibility is to the market ("the general interests") and not to the individual bank. The central bank has no duty to sustain particular institutions. Second, the LLR must take account of the moral hazard problem. It must recognize that when it makes liberal accommodation available, it may create incentives that encourage laxity, recklessness, and excessive risk-taking in the lending practice of individual banks. Thornton's solution to this problem was to advise against bailouts for banks whose distress arises from "rashness," "improvidence," or "misconduct." By subsidizing the risk-bearing function of poorly managed banks, such rescue operations, he implies, would encourage other banks to take excessive speculative risks without fear of the consequences. In short, individual imprudence should be punished by losses. Only if the financial repercussions of such punishment threaten to become widespread should the LLR intervene. His third point, however, was that even in this latter case aid should be extended sparingly and on relatively unfavorable terms. Finally, he was skeptical of the claim that economic welfare is

inevitably harmed when a big bank fails. This argument, he noted, would provide every large bank, no matter how poorly run, with an automatic justification for aid. He felt that the public interest would be better served by the demise of inefficient banks, because the resulting improvement in resource allocation would outweigh any adverse spillover effects of the failure.

Containing Contagion

The third issue addressed by Thornton was whether the LLR should try to prevent shocks to the financial system. Here Thornton answered in the negative. The LLR exists not to prevent shocks—an impossible task in most instances—but to neutralize their secondary repercussions. He argued that a panic could be triggered by any kind of “alarm,” for example, a crop failure, rumors of a foreign invasion, an initial bank failure, and so on. The central bank has no responsibility for stopping these triggering events, but it does have a responsibility for arresting the panic, stopping it from spreading throughout the system. “If any one bank fails,” said Thornton (1802: 180), “a general run on the neighboring ones is apt to take place, which if not checked at the beginning by a pouring into the circulation a large quantity of gold, leads to very extensive mischief.”

The proper response, according to Thornton, is not to stop the initial failure, but to pump liquidity (gold and Bank of England notes) into the market. In Thornton’s view, the actual occurrence of a widespread panic would be properly attributable not to the initial bank failure, but to the central bank’s failure to insulate the economy from the impact of that event. He distinguished between the effects of closing an individual bank and the policy errors of the LLR. Closing an individual bank, he said, contributes very little to “general distress” or “general commercial difficulty.” By contrast, policy errors of the LLR create a “general shock to credit” that “produces Distress through the whole Kingdom” (1802: 287–88, 304–5).

Protecting the Money Stock

Finally, Thornton specified the paramount objective of the LLR as prevention of panic-induced contractions of the money stock that disrupt the payments mechanism and produce depressions in the level of real activity. To him, LLR action was essentially a monetary rather than a banking or credit function. While recognizing that the

LLR acts to forestall bank runs and avert credit crises, Thornton insisted that these actions, although undeniably important, were nevertheless 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 were simply the means, albeit the most efficient and expeditious means, through which it pursued its ultimate objective of preserving the quantity, and hence the purchasing power, of the money stock. The important point was to prevent sharp short-run shrinkages in the quantity of money, since hardship ensued from these rather than from bank runs or credit crises per se.

In this connection, he drew a sharp distinction between bank *credit* (loans and discounts) on the one hand and the stock of bank *money* (notes and checking deposits) on the other. He argued that, although these two aggregates tend to move together, it is the fall of the money stock that does the damage to the real economy. The reason is simple: Money does what credit cannot do, namely serve as the economy's unit of account and means of payment. Since money is the transactions medium of final settlement, it follows that its contractions rather than credit collapses are the root cause of lapses in real activity. He observed (1802: 307): "It is not the limitation of Discounts or Loans, but . . . the limitation of Bank Notes or the Means of Circulation that produces the Mischief" of lost output and employment.

To show how monetary contraction and the resulting fall in output and employment occurs in the absence of offsetting action by the LLR, Thornton traced a chain of causation running from a rumor or alarm to a resulting financial panic to the demand for high-powered money to the money stock itself, and thence to aggregate spending and the level of real economic activity. Panics, he noted, trigger doubts about the solvency of country banks and the safety of their note and deposit liabilities. The result is that money-holders seek to convert these items into money of unquestioned soundness, namely gold or Bank of England notes. These two items, whether circulating as cash or held in bank reserves, comprise the high-powered money base, unaccommodated increases in the demand for which in a fractional reserve banking system are capable of causing multiple contractions of the money stock. The demand for base money, he observed, is doubly augmented during panics. At the same time that money-holders are attempting to convert suspect country bank notes and deposits into gold or its equivalent, country banks 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 significant increase in the demand for base money, which, if not satisfied by increased issues of Bank of England notes, produces sharp contractions in the money stock and equally sharp contractions in spending. Because Thornton contended that wages and other costs were downwardly sticky and therefore responded sluggishly to declines in spending, he thought that output and employment would bear most of the burden of adjustment; that is, the impact of monetary contraction would fall most heavily on real activity.

To prevent this sequence of events, the LLR must stand ready to accommodate all panic-induced increases in the demand for high-powered money. It can readily do so because it has a monopoly over the Bank note component of the monetary base. Expressed in modern terminology, Thornton's argument was essentially this: Define *cash* as gold coin and its equivalent, Bank of England notes in circulation. Likewise, define the *money stock* as the sum of such cash plus the deposit and note liabilities of country banks. Then the LLR must be prepared to offset falls in the money multiplier arising from panic-induced hikes in the public's cash-to-note-and-deposit ratio and in the banks' reserve-to-note-and-deposit ratio with compensating increases in the monetary base. By so doing, it maintains the quantity of money intact, and thereby the level of economic activity.

Thornton saw one complicating factor: panics may induce falls not only in the multiplier, but also in the circulation velocity of money due to a flight to safety and corresponding rises in the precautionary demand for money. For when "a season of distrust arises, prudence suggests, that 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." (1802: 97–98). The result is "to lessen the rapidity of the circulation of notes on the whole, and thus to encrease 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 the base and the money stock to offset the fall in velocity if it intends to stabilize prices and real activity. Here the LLR counters falls in both the money multiplier and velocity with compensating rises in the base.

Walter Bagehot's Contribution

After Thornton, LLR theory received its strongest and most influential exposition in the writings of Walter Bagehot. Already in one of his earliest publications (Bagehot 1848: 267), written when he was but 21, he had stated the essence of the LLR's function, namely, quick provision of liquidity to accommodate sudden, sharp increases in the demand for money that threaten to depress the price level.

Now as paper money can be supplied in unlimited quantities, however sudden the demand may be, it does not appear to us that there is any objection in principle of sudden issues of paper money to meet sudden and large extensions of demand. It gives to a purely metallic circulation that greater constancy of purchasing power possessed by articles whose quantity can be quickly suited to demand [Because] this power of issuing notes is one excessively liable to abuse. . . . it should only be used in rare and exceptional circumstanceswhen the fact of *sudden* demand is proved.

But his main contributions came in his seminal 1873 volume, *Lombard Street*, where he revived and restated many of the points made earlier by Thornton, albeit without mentioning the latter's name (for which we have no explanation). For example, he emphasized the Bank of England's special position as the holder of the ultimate reserve. This position, he noted, rendered the central bank different from ordinary commercial banks. It gave the Bank the power as well as the duty to lend to all solvent institutions offering good collateral in a crisis, the very time when other bankers would be contracting their loans. He also followed Thornton in advocating that the Bank of England hold large buffer stocks of gold reserves from which periodic drains could be accommodated without adversely affecting the quantity of money in circulation. Finally, like Thornton, he distinguished between internal and external cash drains and the appropriate policy response to each. Internal drains, he said, should be countered by a policy of lending freely and vigorously to erase all doubt about the availability of bank accommodation. External drains, by contrast, should be met by sharp rises in the central bank's lending rate, the high interest rate serving to attract gold from abroad and encouraging the retention of gold at home. This rate increase, Bagehot thought, was necessary to protect the metallic component of

the monetary base. According to Bagehot (1873: 155), “the first duty of the Bank of England was to protect the ultimate cash of the country, and to raise the rate of interest so as to protect it.”

A sufficient gold reserve, of course, was necessary both for the preservation of the gold standard and for the maintenance of public confidence in the convertibility of paper currency into gold. On the potential fragility of public confidence, Bagehot (1873: 156–57) wrote that “a panic is sure to be caused” if the gold reserve falls below “a certain minimum which I will call the ‘apprehension minimum.’” Therefore, the LLR should strive to keep its gold reserves above this critical threshold.

Bagehot’s Rule

Bagehot (1873: 27–28) thought that a persistent external drain would trigger an internal drain as the public, observing the diminution of the gold stock below the apprehension minimum and fearing a suspension of convertibility, sought to convert deposits and country bank notes into gold. “Unless you can stop the foreign export,” he wrote, “you cannot allay the domestic alarm.” In this case, in which “periods of internal panic and external demand for bullion commonly occur together,” the LLR must “treat two opposite maladies at once—one requiring stringent remedies, and especially a rapid rise in the rate of interest, and the other, an alleviative treatment with large and ready loans.” Therefore, “the best remedy . . . when a foreign drain is added to a domestic drain” is the provision to offer “very large loans at very high rates.” Here is the origin of the famous Bagehot Rule: “lend freely at a high rate.”

Like Thornton, Bagehot stressed that last-resort lending should not be a continuous practice but rather a temporary emergency measure applicable only in times of banking panics. Like Thornton, he argued that if the central bank responded promptly and vigorously, the panic would be ended in a few days, by implication an interval not long enough for the paper component of the monetary base to depart significantly from its non-inflationary long-run growth track.

Responsibility to the Market

Bagehot also viewed the role of the LLR as primarily a macroeconomic one. The central bank bears the responsibility of guaranteeing

the liquidity of the whole economy but not that of particular institutions. He prescribed last-resort lending as a remedy for emergencies affecting the entire banking system, not for isolated emergency situations affecting an individual bank or a few specific banks. Nor did he intend it to be used to prevent very large or key banks from failing as a consequence of poor management and inefficiency. “Too big to fail” was not a phrase in his lexicon. Like Thornton, he emphasized that the task of the LLR was not to prevent initial failures of unsound institutions, but rather to prevent a subsequent wave of failures spreading through the sound banks of the system.

More generally, he believed with Thornton that the LLR exists not to prevent shocks but to minimize their secondary repercussions. His views on this point appear in his analysis of panics. Panics, said Bagehot (1873: 61), can be triggered by a variety of exogenous events—“a bad harvest, an apprehension of foreign invasions, a sudden failure of a great firm which everybody trusted.” But “no cause is more capable of producing a panic, perhaps none is so capable, as the failure of a first-rate joint stock bank in London” (1873: 29). The shock of this initial failure must be contained before it gets out of hand, because “in wild periods of alarm, one failure makes many.” The problem is how to “arrest the primary failure” that causes “the derivative failures.” Bagehot’s solution (1873: 25), stresses the liberal provision of liquidity to the whole system rather than loans to the distressed bank:

A panic, in a word, is a species of neuralgia, and according to the rules of science you must not starve it. The holders of the cash reserve 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 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. Harmon, 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.

Conspicuously absent is any mention of the need to channel aid to specific institutions as would be implied by bailout operations. Bagehot’s emphasis is clearly on aid to the market rather than to the initially distressed bank. Nowhere does he seek to prevent the initial failure at either any cost or at all costs.

Up to this point, Bagehot’s prescriptions largely followed Thornton’s. But Bagehot did more than just elaborate, refine, and coordinate Thornton’s analysis. He also contributed at least five original points that added substance to LLR doctrine and advanced it beyond Thornton’s prescriptions.

Announced Precommitment

First, Bagehot distinguished between the central bank’s extending support to the market after a crisis began, and its announcement of support in advance of an impending crisis. He argued that the LLR’s duty did not stop with the actual provision of liquidity in times of crisis, but also included advance notice that it would lend freely in any and all future crises. As Bagehot (1873: 85) put it, “the public have a right to know whether [the central bank]—the holder of our ultimate bank reserve—acknowledge this duty, and are ready to perform it.” This assurance alone, he thought, would dispel uncertainty and promote confidence in the central bank’s willingness to act, thus generating a pattern of stabilizing expectations that would help avert future panics. Knowing the LLR would act, the public would not run on the banks. Without such pre-commitment, however, England’s “liability to crises” and “terror of crises” would remain prominent because its citizens could “never [be] sure what policy will be adopted,” or “what amount of advance” would be provided, and “on what security it will be made.”

High (Penalty) Rate

Second, he advocated that last-resort accommodation be made at a penalty rate. Borrowers should have relief in times of crises, but

they should be prepared to pay a stiff penalty. The central bank has a duty to lend, but it should, of necessity, extract a high price for its loans. The premium it charged would ration the scarce liquidity to its highest-valued uses, just as a high price rations any scarce commodity in a free market. Moreover, a penalty rate also had the appeal of distributive equity—it being only fair that borrowers pay handsomely for the protection and security that the LLR provided. Allocative efficiency and distributive justice aside, the penalty rate, Bagehot claimed, would produce at least four additional beneficial results. First, the high rate would encourage the importation and discourage the exportation of specie, thus protecting and enhancing the Bank's and the nation's gold reserve. It would achieve this result by attracting short-term capital from abroad and by exerting a restraining pressure on domestic spending and prices, thereby improving the external balance of trade by reducing imports and spurring exports. Second, consistent with the objective of maintaining stable growth of the note component of the money stock, a penalty rate would ensure the quick retirement of emergency expansions of the Bank note issue once the emergency ends. The very unprofitability of borrowing at the above-market rate would encourage prompt repayment of loans when the panic subsides. The resulting removal from circulation of the money used to pay off the loans would extinguish the emergency issue so that the Bank note component of the money stock would return to its non-inflationary path. Third, the high rate of interest would reduce the quantity of precautionary cash balances that over-cautious agents would want to hold. Without the high rate to deter them, these cash-holders might deplete the Bank's central gold reserve and endanger convertibility. As Bagehot put it, the penalty rate would serve as "a heavy fine on unreasonable timidity," prompting would-be cash-holders to economize on the nation's scarce gold reserve. In this connection, he recommended that the penalty rate be established "early in the panic, so that the fine may be paid early, that no one may borrow out of idle precaution without paying well for it; that the Banking reserve may be protected as far as possible" (1873: 97).

Last and most important, the penalty rate would, in addition to rationing the scarce gold reserve, provide an incentive for banks to exhaust all market sources of liquidity and even develop new sources before coming to the central bank. By spurring individual banks to develop better techniques of money management and the capital

market to develop new channels to mobilize existing liquidity, the penalty rate would promote allocative efficiency of the financial system. In sum, the penalty rate would protect the gold reserve, minimize deviations of the Bank note component of the money stock from its stable path, allocate resources by market price, discourage reliance on the central bank, and ensure that recourse to the latter's lending facilities was truly a last resort.

Bagehot's analysis implies still another use for the penalty rate, namely, providing a test of the soundness of distressed borrowers. A penalty rate set a couple of percentage points above the market rate on alternative sources of funds would encourage illiquid banks to turn to the market first. Success in obtaining accommodation at the market rate would indicate that lenders judge these borrowers to be sound risks. That is, the borrowers and their existing assets would pass the market test. On the other hand, resort to the central bank at the penalty rate might tend to indicate weakness in the borrowing institution, suggesting an inability to borrow in the market at the lower rate. Fearing default, private lenders may demand a risk premium in excess of the differential between the market and penalty rates, forcing the borrowers to resort to the central bank's lending facility. Thus, the penalty rate would set in motion actions that would provide a test of the borrowers' soundness.

Eligible Borrowers and Acceptable Collateral

Bagehot's third contribution was his specification of the types of borrowers the LLR should accommodate, the kinds of assets it should lend on, and the criteria it should use to determine the acceptability of those assets. He thought that the type of borrower was unimportant, that the Bank of England should be willing to accommodate anyone offering good security—"to merchants, to minor bankers, to this man and that man" (1873: 25). The objective of the LLR in time of panic is to satisfy the market's demand for liquidity. By accepting good collateral from any source whatsoever, the LLR avoids favoritism and the channeling of aid to privileged borrowers. Here is the element of *anonymity* that Forrest Capie (1998) sees as essential to impartiality in the granting of last-resort aid. The LLR need not, and indeed cannot, see the identity of the applicant if, for example, the discount window is made of one-way glass. The LLR simply says, "We don't know who you are. Just shove your good

collateral under the window and pay the penalty rate and we will lend you the amount you request.” Anonymity in Bagehot’s time was achieved not through an opaque discount window but through the interposition of discount brokers between banks and the Bank of England (although banks occasionally did borrow directly from the central bank). Liquidity squeezes saw banks call in loans and cash in commercial paper with the discount houses that in turn applied to the central bank for cash. Dealing directly with the discount houses rendered the central bank oblivious to the original source of the pressure.

Concerning the type of collateral on which the central bank should lend, Bagehot’s answer was clear. The bank should stand ready to lend on any and all sound assets, or as he put it, “on every kind of current security, or every sort on which money is ordinarily lent” (1873: 97). Such sound collateral would provide a rough test—additional to the penalty rate—of the solvency of the borrower when other timely proof was unavailable. Likewise, such collateral, provided it was sufficient to cover the loan by a considerable margin, would insure the LLR (and taxpayers) against loss should the borrower default and the assets be liquidated to recover the proceeds of the loan plus accrued interest. Besides the conventionally eligible bills and government securities, acceptable collateral should include “all good banking securities,” and perhaps even “railway debenture stock” (1873: 97, 101). In another passage he makes the point that the “*amount* of the advance is the main consideration . . . not the nature of the security on which the advance is made, always assuming the security to be good” (1873: 101). The basic criterion was that the paper be indisputably good in *ordinary or normal times*. The latter qualification is important. It implies that the LLR should not be afraid to extend loans on normally sound assets whose current market value is temporarily below book value owing to depression in the securities market when stocks are dumped at fire-sale prices. Such assets the LLR should accept at their regular conventional values, not their fire-sale ones.

To summarize, Bagehot argued that the LLR place very few restrictions on the types of assets on which it might lend, or the kinds of borrowers it might accommodate. This position was consistent with his advocacy of price as opposed to nonprice rationing mechanisms. He recommended that the central bank eschew qualitative restraints—eligibility rules, moral suasion, “direct pressure,” admin-

istrative discretion and the like—and instead rely on the penalty rate and a sound-collateral rule to ration borrowing, and promise to continue such a policy to the exhaustion of its gold.

Unsound Institutions

Fourth, Bagehot treated the extent of the LLR's responsibility to individual banks as distinguished from the banking system as a whole. Does this responsibility extend to insolvent banks? Bagehot's answer was an unequivocal "No." The central bank's duty is not to rescue "the 'unsound' people" who constitute "a feeble minority." Such businesses "are afraid even to look frightened for fear their unsoundness may be detected" (1873: 97). In short, the job of the LLR is not to prevent failure at all costs, but rather to confine the impact of such failure to the unsound institutions and to keep their failures from spreading to the sound ones.

Bagehot meant for his strictures to apply even to those large banks whose failure, in the absence of central bank action, could shatter public confidence and start a falling-dominoes chain reaction sequence of contagion and financial collapse. He acknowledged (1873: 129) that if

even one of the greater London joint stock banks failed, there would be an instant suspicion of the whole system. One *terra incognita* being seen to be faulty, every other *terra incognita* would be suspected. If the real government of these banks had for years been known, and if the subsisting banks had been known not to be ruled by the bad mode of government which had ruined the bank that had fallen, then the ruin of that bank would not be hurtful. The other banks would be seen to be exempt from the cause which had destroyed it. But at present the ruin of one of these great banks would greatly impair the credit of all. Scarcely any one knows the precise government of any one; in no case has that government been described on authority; and the fall of one by grave misgovernment would be taken to show that the others might easily be misgoverned also. And a tardy disclosure even of an admirable constitution would not much help the surviving banks: as it was extracted by necessity, it would be received with suspicion. A skeptical world would say "of course they say they are all perfect now"; it would not do for them to say anything else.

Even in this case, however, Bagehot did not think the LLR should extend aid to poorly managed big banks. Instead, it is “the ‘sound’ people, the people who have good security to offer” who constitute “the majority to be protected.” Large unsound key banks are *not* too big to fail. However, their failure must not be allowed to spread to the sound institutions. To Bagehot the distinction was crucial. In his words, “no advances indeed need be made” on assets on “which the [central] Bank will ultimately lose.” Again, in another passage, he offers assurance that if the LLR “should refuse bad bills or bad securities” it “will not make the panic really worse.” To arrest a panic, it is sufficient that the LLR guarantee to provide liquidity to the “solvent merchants and bankers” who comprise the “great majority” of the market. This policy ensures that “the alarm of the solvent merchants and bankers will be stayed” (1873: 97).

Strengthening Self-Reliance

Finally, Bagehot warned against undue reliance on the LLR, and stressed the need to strengthen individual banks. The LLR was in his view not meant to be a substitute for prudent bank practices. Consistent with his *laissez-faire*, free-market philosophy, he argued that the basic strength of the banking system should rest not so much on the availability of last-resort accommodation as on the resources, capital, and soundness of the individual banks. According to him (1873: 36):

We should look at the rest of our banking system, and try to reduce the demands on the Bank [of England] as much as we can. The central machinery being inevitably frail, we should carefully and as much as possible diminish the strain upon it.

Bagehot (1873: 60) described in glowing terms the self-reliant character of a hypothetical, ideal, decentralized “natural system of banking” composed “of many banks keeping their own cash reserve, with the penalty of failure before them if they neglect it.” Elsewhere he pointed out that “under a good system of banking . . . a large number of banks, each feeling that their credit was at stake in keeping a good reserve, probably would keep one; if any one did not, it would be criticized constantly, and would soon lose its standing, and in the end disappear” (1873: 52). In relying on its own soundness rather than the resources of the central bank, such a system, he noted,

“reduces to a minimum the risk that is caused by the deposit [of gold and Bank notes]. If the national money can safely be deposited in banks in any way, this is the way to make it safe” (1873: 53).

Open Market Operations as a Source of Liquidity

One final observation should be made concerning Bagehot’s views on the central bank’s most appropriate instrument to combat panics. Today many banking experts regard open market operations, rather than discount window accommodation, as the most effective way to deal with systemic liquidity crises. Bagehot likely would have agreed. Although he consistently prescribed discount window loans, rather than open market purchases of Treasury bills, to stop panics, he did so because the latter weapon was not widely used in his day. Had the technique of open market operations been highly developed at that time, he would have approved of its use, at least up to the point where the gold stock might be threatened by a foreign drain. Open market operations are consistent with his dictum “that in time of panic” the central bank “must advance freely and vigorously to the public . . . on all good banking securities” (1873: 96–97). Moreover, open market operations would have appealed to his preference for market-oriented allocation mechanisms. He would have approved of this particular policy instrument, which regulates the total amount of money but not its distribution among users or uses. And while open market operations would render Bagehot’s penalty rate inoperative, penalty rates would in any case be unnecessary because with such operations the market itself allocates newly created money among cash-holders.

The Federal Reserve’s Deviation from Classical Theory

The central bank in Thornton and Bagehot’s England learned the classical lessons well. Even with the demise of Overend, Gurney & Co. in 1866, a giant interconnected bank denied a bailout on the grounds that it was poorly managed and deserved to fail, the English system suffered no bank panics for the remainder of the 19th century.

By contrast, the Federal Reserve—America’s monopoly money producer and LLR by virtue of its capacity to create high-powered money without limit—has honored the classical doctrine more in the breach than in the observance. In 1929, under the leadership of

a Board of Governors who were possessed with an anti-speculative compulsion, the Fed, rather than implement an LLR policy, infamously savaged the member banks with a policy of “direct pressure.” This action had the Board prohibit the extension of Reserve Bank credit to any commercial-member bank with any taint of stock market lending, even if it offered eligible paper for discount. The Fed’s restrictive policy resulted in the collapse of bank credit and the banks’ stock of demand deposits, and forced an impossible adjustment problem on the entire economy. No economy can suffer its money stock to be 33 percent destroyed and make the necessary price level adjustment that would maintain relatively full employment of labor and other resources (Friedman and Schwartz 1963, Timberlake 2007). Indeed, the Fed’s policy at this time required a Thornton-Bagehot central bank to correct it! Obviously, if the Fed was responsible for the disequilibrium, it could not also be the cure for the problem. This disastrous contraction of the money stock was unprecedented in scale and severity, either before or since.

Again in 1936–1937, after gold devaluation and gold stock increases were beginning to ameliorate the Contraction/Depression, the Fed Board in alliance with the Secretary of the Treasury doubled member bank reserve requirements. While the banks held “excess” *legal* reserves in their balance sheets, in bankers’ eyes—that is, in the real banking world—those reserves were very much *required*. To emphasize their necessity, the banks quit lending and investing any further; the money stock stuck on dead center; and the recovery from the Great Contraction abruptly stopped. In a period of less than 10 years, the Fed not only did not act as an LLR, but actually caused two momentous monetary contractions that devastated the U.S. economy. Where is the LLR that can correct for an “LLR” that has bred such disasters?

Since the 1930s, the Fed occasionally has abided by the classical doctrine, as when it provided emergency liquidity in the wake of the October 1987 stock market crash, and before Y2K and after 9/11. However, in the recent state of financial disequilibrium, the Fed has taken an approach more activist by several orders of magnitude than its deflationary stance of 1929–1937. With the collapse of Bear Stearns in March 2008, the Fed has extended its plenary monetary powers to provide a Heimlich maneuver to the financial world. It has gone far beyond the classical LLR function.

Expanded Role of the LLR in the Current Crisis

No longer content merely to extend emergency loans to commercial banks on good collateral or to supply emergency liquidity through open market purchases of Treasury bills, the Fed has pushed aggressively on several fronts. It has purchased “toxic”—that is, nonperforming—mortgage-backed securities from Bear Stearns. It has established at least a dozen new lending facilities, through which it has accommodated a wide range of non-bank borrowers, including non-financial firms, investment banks, money market mutual funds, and primary securities dealers. It has advanced against a wide range of unconventional collateral, including mortgage-backed securities, asset-backed commercial paper, consumer and business loans, and debt of government sponsored enterprises (GSEs). These actions of course are consistent with Bagehot’s advice to lend to every conceivable borrower on a wide variety of security, provided it is good. What is inconsistent with Bagehot’s advice is that much of this collateral is complex, risky, opaque, hard-to-value, and subject to default. No one pretends that it is “good security.”

In addition to the foregoing, the Fed also has purchased outright from banks and financial institutions such items as (1) commercial paper, (2) securities backed by credit cards, student loans, auto loans and other assets, and (3) mortgage-backed securities and debt of the GSEs, namely Fannie, Freddie, and the Federal Home Loan Bank. Finally, the Fed has guaranteed debt of Citigroup, and has extended loans to insurance giant AIG, both insolvent firms considered too big and interconnected to fail. In conducting these policies, all in the name of LLR, the Fed violates the classical model in at least seven ways.

1. Emphasis on Credit (Loans) as Opposed to Money. First is the Fed’s shift of focus from money to credit. To classical writers, injections of base money were the essence of LLR operations: The LLR existed solely to expand the base temporarily in amounts sufficient to offset panic-induced falls in both the money multiplier and the circulation velocity of money thus preserving monetary supply-demand equilibrium and price-level stability in the face of bank runs. To today’s Fed, however, base expansion, despite its occurrence on a massive scale, is not the intended goal of LLR operations. Instead those operations are aimed at unblocking

seized-up credit markets, lowering credit risk spreads, and getting banks to lend again. Indeed, at the beginning of the crisis, the Fed sterilized its last-resort loans with equal and offsetting open market sales of Treasury securities so as to leave the base unchanged (Lacker 2009: 57). True, after October 2008 the cumulative volume of last-resort loans and security purchases became too large to sterilize. Even so, the Fed maintained that the resulting doubling of the base was not a policy of quantitative easing designed to protect (or increase) the money supply. Rather it was an incidental side-effect of a credit easing policy designed to shrink credit spreads and free up particular frozen credit markets (Bernanke 2009).¹

This concern with credit instead of money goes back to Fed Chairman Ben Bernanke's earliest published research. There he argued that it was bank failures and the resulting drying-up of credit availability (and destruction of specialized knowledge and other fragile credit relationships) as much as it was money stock contraction that caused the Great Depression. He bolstered this view in his articles of the late 1980s and mid 1990s, positing bank lending as a key variable, independent of money, determining aggregate spending. Bernanke's theory differs from the traditional money-causes-spending cash-balance mechanism of the classicals (Congdon, 2009). 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 hoard the proceeds in an effort to rebuild their cash balances and eliminate the monetary shortfall. The reduced spending, in turn, would cause prices and, given sticky wages, output to fall until cashholders were just content to hold the reduced money stock such that the excess money demand vanished. Applying their analysis to the current recession, classicals might say that the Fed, whose doubling of the base precisely offset a halving of the multiplier, nevertheless failed to expand the base additionally to counter also falls in velocity. Consequently, money supply fell below money demand causing prices and real activity to

¹Before October 2008 the interest-rate-targeting Fed's rationale for loan sterilization was to prevent base money creation that would drive the overnight interest rate below the Fed's target rate. After October 2008, when the actual and target rates were zero and could go no lower, there was no need to sterilize loans to prevent falls in the rate. In this case, extra loans resulted in net base injections.

fall in the recession of 2008–09. Money drives spending in the classical view.²

By contrast, for Bernanke it is not money but rather the volume of bank loans that determines spending and real activity through both aggregate demand and aggregate supply channels. Business firms require credit to finance their capital investment and their current operations. A decrease in the availability of bank credit removes a key source of finance for investment and so reduces the investment component of aggregate demand. At the same time, the freezing up of bank credit adversely affects aggregate supply by reducing funds available to finance firms' purchases of factor inputs employed in the production process. Firms, constrained to purchase less labor, capital, raw materials, and other ingredients of final product, will cut production such that output falls due to that influence too. It's as if bank credit enters the production function relating aggregate output to the inputs used to produce it.

To this day, however, Bernanke's 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. Likewise, no proof exists that the unclogging of credit channels is superior to a policy of maintaining the quantity of money (or increasing that quantity to match rises in the demand for it) as a means of stabilizing real activity in the face of temporary shocks. On the contrary, empirical evidence supports the opposite notion, namely that the link between money and income is more solid and reliable than the link between bank lending and spending (Congdon 2009). Indeed the evidence is that money drives spending even if lending is unchanged or moving opposite to money (although normally they move together). Credit crunches impact real activity through changes in money supply or demand. Historically and statistically, the monetary view trumps the credit view. It suggests that maintenance of equality between money supply and demand sustains spending (just as creation of an excess supply of money stimu-

²Modern variants stress portfolio-rebalancing effects. Agents attempt to eliminate excess money demands by purchasing fewer financial assets (stocks, bonds, mortgages, etc.), whose prices fall and interest rates rise. The price falls and interest rate rises depress real activity and deflate the general level of commodity prices until agents are just satisfied to hold the smaller quantity of money.

lates spending) even when banks and bank lending are in a dysfunctional state.

2. *Taking Junk Collateral.* Second, the Fed has violated the classical admonition to advance only on sound security by accepting questionable, hard-to-value collateral. The same is true of its purchases of toxic paper. Such junk-asset acquisition introduces risk into the Fed's balance sheet. Should these assets subsequently fall in value and the Fed incur losses on its portfolio, three possibilities ensue. First, the Fed has smaller seigniorage earnings to remit to the Treasury, which means that given the Treasury's revenue needs, taxes must now be increased to cover them, or government spending must decrease. By influencing the Treasury's tax/expenditure bill, the Fed becomes a fiscal policymaker when it was designed to operate only as a monetary agency. The second possibility when the Fed loses heavily on its portfolio is that it has assets of insufficient saleable value with which to mop up excess liquidity after the end of the current crisis. To obtain the necessary assets to replace the worthless ones, the Fed may have to ask the Treasury to issue it additional T-bills in exchange for an equity stake or deposit account in the central bank. Although the Fed can then mop up the extra money through T-bill sales, it will have eroded its independence by giving the Treasury partial ownership and significant control over the creation of money—an arrangement that virtually guarantees further inflation. Still a third possibility is that the Fed may attempt to recover the drop in asset value by using its money-creating power to purchase unconventional assets, namely foreign exchange, long-term Treasury bonds, and stocks and bonds of private firms. The resulting creation of extra money at the very time the Fed is seeking to remove it not only is inconsistent but will engender inflation, pure and simple, contrary to the Fed's goal of monetary and price-level stability. None of these possibilities is reassuring.

3. *Charging Subsidy Rates.* Third, the Fed has deviated from Bagehot's instructions to charge high, that is, above-market, or penalty, interest rates. Quite to the contrary, it has accommodated AIG and other borrowers at below-market, or subsidy, rates. It charged AIG rates of 8.5 to 12 percent at a time when junk bonds, equivalent in quality to the near-bankrupt AIG's assets, were yielding in excess of 17 percent. And on many of its other last-resort loans, the Fed, in a bow to Bagehot, charged rates of 100 basis

points (later lowered to 25 basis points) above its federal funds rate target (Madigan 2009). Because the Fed already had lowered its fed funds target rate to near zero, however, the resulting loan rates ranged from approximately $\frac{1}{4}$ percent to 1 percent, hardly high “penalty rates” in Bagehot’s sense of the term. Finally, in the case of last-resort loans secured by asset-backed commercial paper purchased by borrowing banks from money market mutual funds, the Fed charged no differential penalty rate whatsoever (Madigan 2009). Charging non-competitive rates violates the classical ideal of impartiality in LLR lending, and channels credit, not to its highest and best uses as the market would do, but rather to politically favored recipients. The same inefficient and suboptimal allocation of credit occurs when the Fed purchases tarnished assets from selected issuers.

4. Rescuing Insolvent Firms Too Big and Interconnected to Fail. Fourth, the Fed ignored the classical advice never to accommodate unsound borrowers when it helped bail out insolvent Citigroup and AIG. Judging each firm too big and 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 allegedly have brought collapse of the entire financial system. Fed policymakers overlooked the fact that Bagehot already had treated 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 go 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’ capital and labor resources, as well as their counterparty interrelationships and specific information on borrowers, will still be in place to be put to more effective and less risky uses by their new owners.

The truth is that the Fed has set a dangerous precedent by bailing out Citigroup and AIG. Not only do the bailouts intensify systemic hazard (the very hazard Fed policy is supposed to alleviate) by creating incentives for other firms to take excessive risks so that they too can become big and be rescued if their risks go sour, they

also open the door to baneful possibilities of a political nature. What is to stop a future president and his acquiescent Congress, all citing the Fed's precedent, from applying the bailout remedy to other crises? Indeed, if the bailouts habitually include monetization of the debts of rescued conglomerates—something the Fed avoids only if it sterilizes LLR loans—the result would be disastrous. Imagine the Fed being pressured to resolve the Social Security, Medicare, and other entitlement financing crises by monetizing the vast unfunded liabilities of those programs. The resulting inflation would imitate and rival the German Reichsbank hyperinflation of 1922–1923.

5. *Extension of Loan Repayment Deadlines.* Fifth, the Fed violates the maturity constraints that classical analysts placed on LLR lending. Thornton and Bagehot saw LLR aid as an emergency expedient lasting a few days at most: LLR loans were to be repaid immediately upon the end of a panic. Today's Fed, by contrast, prolongs the repayment deadline far beyond the limit set by the classical prescription. The Fed's so-called Term Auction Facility (TAF) loans carry 28- and 84-day repayment deadlines, and the initial loan to AIG remained outstanding for almost two months. To the extent that these loans are financed by base money creation, they delay unduly the return of the base to its long-run non-inflationary path. To the extent that they are financed by credit creation (i.e., purely compositional shifts in the Fed's balance sheet to accommodate targeted borrowers), they put taxpayers at risk for a protracted period of time (Goodfriend 2009).

6. *No Pre-announced Commitment.* The sixth deviation from the classical doctrine is the Fed's failure to specify and announce a consistent LLR policy in advance of all future crises so that market participants can form stabilizing expectations. Indeed, Allan Meltzer (2009: 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 JP Morgan-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 what criteria and indicators trigger its decisions, nor promised that it would rely on the same triggers in all future crises. This lack of a clearly laid-out LLR

commitment confuses market participants and generates uncertainty. It is counterproductive to quelling panics and crises.

7. *No Clear Exit Strategy.* The Fed's failure to articulate a convincing exit strategy to remove or neutralize excess reserves created as a by-product of its credit-easing policies constitutes a seventh deviation from the classical model. Classical LLR theorists offered an exit strategy to eradicate monetary overhang at crisis's end that was simple, clear, certain, and automatic. Either no action was required (as when credible precommitment halted panics and runs before they began), or the penalty rate eliminated excess money by spurring borrowers to repay their costly LLR 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 monetary overhang by selling the collateral securing those loans.

Such outcomes are largely unavailable to the Fed given its failure to precommit, to charge penalty rates on all its loans, and to hold collateral whose market value is at least equal to that of the loans. True, Chairman Bernanke (2009) has described new tools designed to mop up, or immobilize, excess reserves in a "smooth and timely manner" when the crisis ends and the recovery begins. These tools include (1) raising interest paid on excess reserves (so that banks will hoard them instead of lending them out in the form of newly created deposits), and (2) selling long-term securities from the Fed's portfolio with agreement to buy them back at a later date. But Bernanke has not specified the conditions or indicators that would trigger the application of these tools. The result has been to create uncertainty and to fan fears that the tools will be applied either too late in the recovery to prevent inflation or too early, thereby aborting the recovery.

Nor has the Fed erased doubts that, its purely technical ability to handle the tools flawlessly notwithstanding, it may lack the political will and courage to do so. How unpopular will it be, for example, to pay bankers competitive interest rates to hold excess reserves in idleness when the rest of the economy is complaining of monetary tightness? Likewise, can the Fed withstand the howls of politicians, for whom no interest rate can be too low, when its security sales put upward pressure on long-term rates and threaten to throttle the recovery? A classical, rule-bound strategy that left nothing to the central bank's discretion might help avoid these problems.

Conclusion

Classical economists Thornton and Bagehot demonstrated that their LLR policy—namely, filling the economy with emergency injections of liquidity (albeit at high interest rates) while letting insolvent firms fail—were capable of stabilizing (and expanding) the money stock in the face of shocks to the system. Provided the LLR did nothing like paying interest on excess reserves to inhibit free circulation of the extra liquidity, its operations ensured that, despite the shocks, all money demands would be satisfied so that the economy's capacity level of payments could be consummated and its transactions settled smoothly. To the classicals that was all the LLR could do, and it was enough. No doubt capital values still needed to adjust downward, but financial and capital markets would see to that.

The modern Fed is not an LLR. Its managers now contend that it can and should do more, without considering any traditional checks and balances. They invent their own rationale for its expanded activity. Their supposition, however, is questionable. The preceding review of their assumptions of powers suggests that their policies are hardly benign, and that extension of central bank assistance to insolvent too-big-to-fail firms at below-market rates on junk-bond collateral may, besides the uncertainty, inefficiency, and moral hazard it generates, bring losses to the Fed and the taxpayer, all without compensating benefits. Worse still, it is a probable prelude to a severe inflation and to future crises dwarfing the current one.

The foregoing analysis implies that the Fed might consider abandoning its expanded role and scaling back its operations to the limited classical LLR policy of preannounced lending to sound borrowers on good security and providing emergency liquidity via open market operations to the market in general. Moreover, it should advertise and emphasize its overall policy as one of achieving and maintaining a stable money stock, price level, payments mechanism, and level of real activity. The classical LLR model, though limited in comparison with the Fed's ambitious contemporary initiatives, is powerful enough to handle crises and bank runs, including runs not only of depositors on commercial banks, but also of banks and investors on investment banks, money market funds, hedge funds, special purpose vehicles, and the like. If so, the classical LLR is sufficient to stop panics and the Fed's expanded initiatives

may be superfluous. Returning to the classical model also would be consistent with the traditional strict assignment of monetary tasks to the central bank and fiscal tasks to the Treasury.

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