



---

## **FRACTIONAL RESERVE BANKING**

---

BY LAWRENCE H. WHITE

House Subcommittee on Domestic Monetary Policy and Technology  
United States House of Representatives  
June 28, 2012

Chairman Paul and members of the subcommittee: Thank you for the opportunity to discuss the fractional-reserve character of modern banking, its positives and negatives, its relationship to financial instability, and to offer my thoughts on how to promote greater banking stability. I will begin by describing the historical origins of fractional-reserve banking (hereafter FRB), then move on to the effect of FRB on the money supply process, its connection to bank runs and financial instability, and finally the reforms needed to improve our banking system.

### **THE ORIGINS OF FRACTIONAL RESERVE BANKING**

A “bank” is a firm that both gathers funds by taking in “deposits” (or creating account balances) and makes loans with the funds gathered. A moneylender who draws only on his own wealth is not a banker, nor is a warehouseman who does not lend. A “deposit,” in ordinary modern usage, is a debt claim, an IOU issued by the banker and held by the “depositor,” which the banker is obliged to repay according to the terms of the contract. We can distinguish between a “time deposit,” which the banker is obliged to repay only at a specified date in the future, and a “demand deposit,” which gives the customer the legal right to repayment “on demand,” that is, whenever the customer chooses (on any day the bank is open).

Historically, deposit-taking grew out of the coin-changing and safekeeping businesses. Medieval Italian money-changers would (for a fee) swap coins from one city for those from another. Some traveling merchants, who brought in coins of one type, would chose to hold balances “on account” for the time being, preferring to receive coins of another type later when it was more convenient. The earliest deposit-takers in London were goldsmiths, artisans who made gold jewelry and candlesticks, who were also coin-changers. Like the Italian coin-changers, they provided safe-keeping in the vaults where they kept their own silver and gold.

A key to the development of fractional-reserve banking was that vault-keepers (money-changers and goldsmiths) began to provide payment services by deposit transfer. The earliest record of payment by deposit transfer is from Italy around 1200 AD. Before deposits became transferable, suppose Alphonso wanted to pay (say) 100 ounces of coined silver to Bartolomeo, both of them customers of the same vault-keeper. Al would go to the vault-keeper, have him weigh out the requisite amount of coins, and transport the coins to Bart, who would then have to trans-

For more information or to meet with the scholars, contact  
Robin Bowen, (703) 993-8582, [rbowen5@gmu.edu](mailto:rbowen5@gmu.edu)  
Mercatus Center at George Mason University, 3301 Fairfax Drive, 4<sup>th</sup> Floor, Arlington, VA 22201

*The ideas presented in this document do not represent official positions of the Mercatus Center or George Mason University.*

port the coins back to the vault-keeper to have them weighed again and placed back in the vault. There was great inconvenience, not to say risk, in transporting the coins across town and back. And there were fees to pay for weighing the coins. At the end of the day, Al's account balance or claim on the vault-keeper would be down by 100 ounces (plus transaction fees), and Bart's would be up by 100 ounces (minus transaction fees).

A less burdensome and safer way to accomplish such a payment was for Al and Bart to meet at the bank, and simply tell the banker to transfer 100 ounces on his books by writing Al's account balance down and Bart's up. No coins had to be weighed or moved, or even touched at all. Payment was now made not by handing over coins, but by handing over claims to coins.

Other methods for authorizing deposit transfer were often more convenient and soon displaced the three-party meeting in the banker's office. For example, Al could sign a written authorization, what we now call a check. Today we have electronic funds transfer, but all of these methods accomplish the same end, which is to make a transfer funds from one account to another.

Some of the earliest deposit-taking was simple warehousing, in which the coins deposited were merely stored, and the exact same coins would be returned to the depositor on demand assuming all storage fees had been paid. (In legal parlance such a claim on the warehouseman is a "bailment" and not a debt.) In the early Middle Ages a customer who wanted this kind of storage would bring the coins to the vault in a sealed bag. The bag was not to be opened by the warehouseman. For each specific bag of coins that could be claimed by Al or Bart, those specific bag of coins were always in the vault. Supposing that the bags' contents were recorded on the books (which they need not have been), we could say that for each ounce of coined silver claimed by depositors there was always an ounce of coined silver in the vault. This arrangement, which resembles the business today of renting safety deposit boxes, is sometimes described as "100 percent reserve banking," although strictly speaking it isn't banking at all, but simply warehousing.

As payment by deposit transfer became popular, goldsmiths and coin-changers found that they could offer a different kind of contract to customers who primarily wanted not storage but economical payment services. In a "fractional reserve" contract, the vault-keeper becomes a banker, able to lend out some of the funds deposited. In the early Middle Ages a customer who wanted this kind of account would bring loose coins to the vault. The coins could be mingled with other depositors' coins, whereas in money warehousing there is no evident rationale for mingling. The customer would receive a redeemable claim, entitling him to get back equivalent coins on demand, but not to receive back the identical coins he brought in. The account is now a debt claim and not a bailment. Now the coins in the vault are a fraction of immediately demandable deposits. We can describe them as a reserve for meeting the redemption claims that will actually be made.

Later, beginning perhaps in the 1400s, banks began to issue deposit receipts that could be signed over, making them something like traveler's checks today. For their customers' convenience, they soon provided them in bearer form (no signing-over necessary) and round denominations. These we call banknotes, paper currency claims on banks that were payable to the bearer (whoever presented them), typically on demand. As currency, they could be transferable anonymously, and without bank involvement (unlike deposits transfers, which need to be recorded on the books). London goldsmiths were issuing banknotes in the mid-1600s. Banks also held fractional reserves against the total of their banknote liabilities.

#### WHEN IS A FRACTIONAL RESERVE FEASIBLE?

For a unique or specific coin, which the customer wants to have back, it isn't. A specific coin lent cannot be instantly recalled from the borrower who has spent it. But for coins that customers regard as interchangeable with other coins, it is. Likewise, you count on a coat check stand to keep your specific coat there all evening, and not to lend it

out, because you don't want back just any coat of the same size. Unlike coat-checkers, most depositors are willing to treat coins as interchangeable. Depositors do not insist on getting the very same coins back, so any equivalent coin in reserve will be satisfactory.

To avoid defaulting, or breaching the contractual obligation to repay, the bank obviously needs to keep enough coins in reserve. How can the bank count on having enough coins to meet all requests? It is a matter of practical calculation: The bank needs to know from experience the probability of any given amount of coins being demand on a given day. If it wants to be 99.99 percent safe, it needs to hold a reserve (or have ways of replenishing its reserves) sufficient to cover 99.99 percent of cases.

The economist Ludwig von Mises offered the following illustration. Consider a baker who issues 100 tokens, each stamped "good for one loaf of bread." Leaving aside lost tokens, it is clear that the baker will need 100 loaves. All the tokens will be redeemed, because using them to get bread is their only use. By contrast, transferable claims to coin (bank deposits or banknotes) are useful even without being redeemed. Unlike bread tokens, which cannot be eaten with butter and jam, transferable bank accounts or banknotes can do the job of the coins in making payments. Once payment by deposit transfer and banknote becomes popular, the banker will reliably find that not all deposits notes or deposits are redeemed for coins on a given day, even if all are used to make payments. Thus a banker who issues \$100 in demand deposits or notes will need less than \$100 in coin to meet all the redemptions that will actually be demanded.

How much less than 100 percent the banker can hold, and still meet all the redemption demands that he does face, is a problem that the banker must solve by practical statistical calculation. There is no reason to think that a central authority can do the calculation better, and can improve matters by imposing an arbitrary percentage requirement. To provide the right incentive to hold enough reserves, it is important that the imprudent banker who miscalculates, holds too little in reserves, and fails to pay when obligated to pay, be subject to the ordinary legal penalties for breach of contract.

## ADVANTAGES AND DISADVANTAGES OF FRACTIONAL RESERVES

The advantage to the bank from keeping fractional reserves is clear: It earns interest on the lent-out funds. A few commentators have declared that FRB must be a fraud: The gain is all on the bank's side, and no customer would agree to it if she realized what the bank was up to. But this claim assumes that there are no advantages to the bank's customers. In fact there are clear advantages to the bank's customers, at least under competition. To compete for customers, all experience shows, banks offering fractional-reserve accounts charge zero storage fees and even pay interest on deposits, up to point where the interest they pay falls short of the interest they earn only by just enough to cover the bank's operating costs for safekeeping and payment services. In this way FRB creates a synergy between payments services (checkable deposits, banknotes) and intermediation (pooling savers' funds for lending to selected borrowers). When the deposited funds that are not needed as reserves can be lent out, depositors enjoy lower (or zero) storage fees and interest on checking deposit balances.

By contrast to money warehousing, the savings of fractional-reserve banking do carry a disadvantage in the form of greater default risk. If the bank's investments go sour, the depositor may not be repaid in full. The warehouse, by contrast, makes no investments. So the customer choosing between a bank account contract and a warehousing contract needs to consider: Is the saving in storage fees and the interest paid on deposits high enough (relative to the increased risk of not being paid promptly)? Historically, in competitive systems where banks were free to diversify and capitalize themselves well, the answer was yes for most people. Thus well informed consumers who want economical payment services typically prefer a fractional-reserve bank to a warehouse. In sound banking systems historically, before deposit insurance, the risk of loss was a small fraction of one percent, while the interest was more than one percent, and the sum of interest and storage fee savings was even higher. Thus FRB can arise and survive without fraud.

The economist George Selgin has examined the record of the London goldsmith bankers, and debunked the myth that they pulled a fraudulent switcheroo, promising 100 percent reserves but holding less, at the beginning of the practice of FRB. Goldsmith bank accounts became enormously popular in the mid-1600s because they offered interest on demand deposits. The offer of interest is a clear signal that the contract is not a warehousing contract.

For payment by account transfer, FRB offers a more economic way of providing payment services. A money warehouse or 100 percent reserve institution could also offer payments by account transfer, but its services would be significantly more expensive. The other bank payment instrument, redeemable banknotes circulating in round denominations, simply cannot exist without fractional reserves. Banknotes are feasible for a fractional-reserve bank because the bank doesn't need to assess storage fees to cover its costs. It can let the notes circulate anonymously and at face value, unencumbered by fees, and cover its costs by interest income. An issuer of circulating 100 percent reserve notes would need to assess storage fees on someone, but would be unable to assess them on unknown note-holders. There are no known historical examples of circulating 100 percent reserve notes unencumbered by storage fees.

Under a gold or silver standard, the introduction and public acceptance of fractionally backed demand deposits and banknotes means that the economy needs less gold or silver in its vaults to supply the quantity of money balances (commonly accepted media of exchange) that the public wants to hold. Thus money is supplied at a lower resource cost, that is, with less labor and capital devoted to mining or importing precious metals and fashioning them into coins or bars. Looking at the change in balance sheets from money warehouses to fractional reserve banks, the economy can now fund productive enterprises where before it only held metal. Gold can be exported, and productive machinery imported. This development in Scotland was praised by Adam Smith as a source of his country's economic growth. As the economist Ludwig von Mises put it, "Fiduciary media [fractionally backed demand deposits and banknotes] ... enrich both the person that issues them and the community that employs them."

Under a fiat money standard, as we have today with the Federal Reserve dollar, things are different. There are no mining or minting costs saved by holding fractional rather than 100 percent reserves in the form of fiat money. For commercial banks to hold 100 percent reserves in the form of fiat money issued by the federal government would, however, change drastically the function of the banks. Instead of funding productive enterprises, the banks would instead only fund the federal government. Fewer loanable funds would be available to the private economy, and more to the government. Private investment would be suppressed, and public spending enlarged.

## THE EFFECT OF FRB ON THE MONEY SUPPLY PROCESS

With banks holding fractional reserves of Federal Reserve dollars (notes and deposit claims on the books of the Fed, whose sum is called "the monetary base"), when the Fed increases the quantity of Federal Reserve dollars by \$1 billion, the banking system ordinarily creates a multiple amount of deposit dollars. The total stock of money held by the public ("M1") increases, say by \$2.3 billion. At the moment, however, we are in an anomalous situation. Banks are sitting on such vast quantities of excess reserves—paid to do so by the Federal Reserve as it pays a relative high interest rate on reserves—that the monetary base is larger than M1. Thus the U.S. banking system today actually has more than 100 percent reserves against its demand deposits.

## THE PROBLEMS OF FINANCIAL INSTABILITY, BANK RUNS, AND CRISES

Perhaps the leading leading argument made in favor of government regulation of banks is the argument claiming that a fractional-reserve banking system is inherently fragile and so needs deposit insurance. The argument rests on three underlying propositions:

- a. An uninsured fractional-reserve banking system is inherently prone to runs and (due to “contagion”) panics. (A run means that many depositors seek to withdraw at the same time, out of fear of a reduced payoff if they wait. A panic means that many banks suffer runs at the same time.)
- b. Runs and panics have net harmful effects.
- c. Deposit insurance can reduce runs and panics below their laissez-faire level at a cost less than the benefit of doing so.

My research into banking history convinces me that (a) and (c) are actually false, and even proposition (b) requires some qualification.

A run is always possible against fractionally backed bank deposits that are unconditionally redeemable on demand. Against such deposits, a run can even, in theory, be self-justifying: If a run forces the bank to conduct a hasty sale of illiquid assets, the bank may receive such a reduced value for its assets that it becomes insolvent (liabilities exceed assets), so that all depositors can no longer be paid in full. From this theoretical possibility, some economic theorists have jumped to the conclusion that fractional-reserve banks are in practice inherently run-prone. (The best known statement is a 1983 article by Douglas Diamond and Phillip Dybvig.) According to this view, a run can happen at any time, in any place, on any bank, triggered by nothing more than random fears or events that have no basis in the target bank’s solidity.

But are real-world deposit contracts so fragile? Historical evidence says no. Please consider: If real-world deposit contracts really were as fragile as the self-justifying-run theory supposes, it would be a mystery how they survived centuries of Darwinian banking competition before the first government deposit insurance schemes began. Wouldn’t a more robust arrangement have come to dominate the field?

The theory of runs that better fits the historical record is that runs occur, not randomly, but when depositors receive bad news indicating that their bank might be already (pre-run) insolvent. Receiving such news, depositors run because if assets are already too small to pay all depositors back, the last in line get little or nothing. Unlike the self-justifying-run theory, the bad-news theory explains why runs typically occurred at onset of recessions (when bad news arrived about the banks’ borrowers declaring bankruptcy), and explains why countries that did not weaken their banks with legal restrictions (e.g., Scotland, Canada) very seldom experienced runs and almost never panics.

What makes a deposit contract run prone? Assume that depositors are rational. There must be a greater expected payoff to arriving sooner rather than later to redeem one’s deposit. This implies that the deposit is unconditionally redeemable on demand (and that the bank pays on a first-come-first-served basis), and that default is likely on last claim serviced. To make an account non-run-prone it suffices to modify either one of these two conditions. First, the deposit contract can make redemption conditional rather than unconditional. An important historical example was the “notice of withdrawal clause” that many savings banks and trust companies included in their deposit contracts. If withdrawals were too great for a bank to satisfy without suffering severe losses from hasty asset liquidation, the banker had the option to defer redemption for 60 or 90 days by requiring notice of intent to withdraw to be given that far in advance.

More importantly, banks made default unlikely by providing their depositors with credible assurances that the bank would maintain solvency, that is, assets sufficient to pay in full even the last in line, even under adverse circumstance. To provide credible assurance, banks before deposit insurance held much higher capital than they do today, in the neighborhood of 20 percent. They invested much more conservatively, so that they faced much less risk of large asset losses. They avoided loans with high default risk, high risk of loss from interest-rate movements, and loans that were illiquid (hard to resell). Banks that relied on demand deposits and banknotes did not make long-term fixed-rate housing loans, for example. They invested primarily in short-term, high-quality, liquid business IOUs, what were then called “bills of exchange” and is today called “commercial paper.” In some countries, banks had an additional backstop in the form of the right to call for more capital from their shareholders if otherwise depositors would go unpaid. Shareholders had extended liability, and in some systems unlimited liability, for the bank’s debts.

The historical record does of course indicate that runs and banking panics were a problem in United States during the pre-Fed or “National Banking” era (1863-1913), and also under the Fed’s watch during the early years of the Great Depression. But few other countries have had similar experiences. It is therefore clear that run-proneness and panics are not inherent to fractional-reserve banking. If we look for a pattern across countries, this is what we find: Countries like Canada, Scotland, Sweden, and Switzerland, where the banking systems had no more than minimal restrictions on entry, note-issue, branching, and capitalization, had virtually no problem from runs and none from panics, in contrast to the more restricted and hence weaker banking systems of the United States and England.

The U.S. banking system was made fragile by the federal and state ban on interstate branching, and even branching within many states. Branch banking limits reduced diversification of assets and deposit sources, indirectly limited capitalization, and hampered the effective allocation of reserves. Poorly diversified and poorly capitalized banks could not offer credible solvency assurances, which made them more vulnerable to “bad news” runs.

The U.S. system was also made fragile by federal restrictions on banknote issue that prevented banks from meeting peak demands for currency. Because of those restrictions, seasonal demands for currency became scrambles for reserve money that occasionally escalated into panics.

## REFORMS TO STRENGTHEN OUR BANKING SYSTEM

The weakness in the U.S. banking system today stems from a different set of government policies than the ban on branching (eroded in the 1980s and finally eliminated in 1995) and restriction on banknote issue (commercial banks stopped being allowed to issue any notes in the 1930s). Today the weakness is due not to restrictions, but to privileges. One indication of that is that the weakest banks today are not the smallest, but the largest banking companies.

Federal deposit insurance, since its birth in the 1930s, has meant that a comparatively risky bank (one with capital less adequate to cover potential losses on its asset portfolio) no longer faces a penalty in the market for retail deposits. Insured depositors have no incentive to shop around for a safe bank, so they no longer demand a higher interest rate to give it their deposits. Risk-taking is thereby effectively subsidized. Attempts to price deposit insurance according to risk, so as to recreate a penalty for holding on a risk bank portfolio, were mandated by the FDIC improvement act, but the attempt has failed. The FDIC insurance fund has been exhausted by bank failures, and now has a negative balance. Taxpayers are on the hook for the morally hazardous banking that the FDIC has fostered. Some way of rolling back and ultimately ending federal deposit insurance must be found.

The “too big to fail” doctrine compounds the problem. It gives even blanket protection even to a bank’s legally uninsured depositors and subordinated debt holders, removing their incentive to shop around for a prudently managed bank. “Too big to fail” treatment went from the exceptional event to the routine event during the last

five years, as the Federal Reserve and the FDIC have deliberately declined to close several large insolvent banks. If no large bank is ever allowed to fail, then large depositors flock to the large banks that have the privilege of an implicit guarantee for all. On such a tilted playing field, an unnaturally large share of deposits flows into the largest banks. We are already there. Some way of ending “too big to fail” must be found—quickly.

## CONCLUSION

The evidence shows that a fractional-reserve banking system is not unstable when the banking system is free of hobbling legal restrictions and free of privileges. The U.S. banking system in the 19th century was weakened by legal restrictions. In response to that weakness, rather than let the banking system become robust by repealing its restrictions, Congress in the 20th century patched over the problem by creating the Federal Reserve system (to act a “lender of last resort”) and federal deposit insurance. As a result, the U.S. banking system in the 21st century is chronically weakened by government privileges (especially taxpayer-backed deposit insurance and taxpayer-backed “too big to fail” bailouts) that generate moral hazard. Banks take advantage of these guarantees by holding asset portfolios too full of default risk and interest-rate risk. They finance their portfolios with excess leverage (too much debt, not enough equity). Rather than trying to come up with another patch, Congress should seek to dismantle the restrictions and the privileges that have left the American people saddled with an unhealthy banking system.

---

## ABOUT THE MERCATUS CENTER AT GEORGE MASON UNIVERSITY

The Mercatus Center at George Mason University is the world's premier university source for market-oriented ideas—bridging the gap between academic ideas and real-world problems.

A university-based research center, Mercatus advances knowledge about how markets work to improve people's lives by training graduate students, conducting research, and applying economics to offer solutions to society's most pressing problems.

Our mission is to generate knowledge and understanding of the institutions that affect the freedom to prosper and to find sustainable solutions that overcome the barriers preventing individuals from living free, prosperous, and peaceful lives.

Founded in 1980, the Mercatus Center is located on George Mason University's Arlington campus.

[www.mercatus.org](http://www.mercatus.org)

---

## ABOUT THE AUTHOR

Lawrence H. White is a professor of economics at George Mason University. Before coming to Mason, he was the F. A. Hayek Professor of Economic History in the Department of Economics, University of Missouri, St. Louis. He has been a visiting professor at the Queen's School of Management and Economics, Queen's University of Belfast, and a visiting scholar at the Federal Reserve Bank of Atlanta. He is the author of *The Theory of Monetary Institutions* (Blackwell, 1999), *Free Banking in Britain* (2nd ed., IEA, 1995), and *Competition and Currency* (NYU Press, 1989). His articles on monetary theory and banking history have appeared in the *American Economic Review*, the *Journal of Economic Literature*, the *Journal of Money, Credit, and Banking*, and other leading professional journals.