Antifragile Banking and Monetary Systems

Lawrence H. White

"Fragility" is the well-known property of being easily breakable, of failing under moderate stress. The opposite property is "antifragility," a term coined by Nassim Nicholas Taleb (2012a) and the title of his recent book. Taleb (2012b) defines antifragility as the property exhibited by "things that gain strength from stressors and get stronger from failure, like evolution." An antifragile thing or system is stress-loving. What doesn't kill it makes it stronger. We exercise, for example, because our muscles grow stronger from moderate stress. Robustness, an intermediate concept, is the property of being unaffected either way by moderate stresses. Taleb illustrates the three-fold distinction this way: We stamp "handle with care" on a package containing something fragile; we needn't stamp any instructions on a package containing something robust, because it won't be affected by handling; but we would stamp "please handle roughly" on a package containing something antifragile, because such handling would make it emerge stronger.

Here I consider how we might achieve antifragile banking and monetary systems. There are reforms that can marginally reduce fragility, but I will argue that to achieve antifragility will require a serious turn away from "one-practice-fits-all" centralized regulation and toward a free market's mixture of innovation and strict discipline. In banking it will require an end not only to "too big to fail" bailouts of uninsured creditors and counterparties, but also to other forms of taxpayer-backed depositor and creditor guarantees. Deposit

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Lawrence H. White is Professor of Economics at George Mason University.

guarantees, contrary to intention and despite their immediate run-suppressing effects, in the long run have fostered moral hazard and thereby contributed to banking system fragility. In monetary policy, it will require an end to centralized monetary policy. The centralization of money issue has eliminated the market-based disciplinary and error-correction mechanisms that once governed money creation, thereby putting all our monetary eggs in one basket and creating monetary system fragility.

The Banking System Is Not Naturally Fragile

Many economists—and certainly regulators—will object that to make the banking system antifragile is a futile undertaking because banking is *naturally fragile*, meaning, inherently prone to collapse in the absence of government guarantees to depositors (and by extension guarantees to all short-term creditors).[1] For example, Nobel laureate economist Robert Lucas (2011: 20), in the slides accompanying a recent lecture that is otherwise favorable to free markets, states flatly that "a fractional reserve banking system will always be fragile, a house of cards." In such a view the best that can be done is to institute government guarantees to mitigate fragility, or perhaps to outlaw fractional reserve banking, as recommended by Kotlikoff (2010) among others, by banning the modern practice of providing payments services through checking accounts whose balances are demandable debts.

The most widely cited model of banking in the economics literature today is the Diamond-Dybvig (1983) model, which depicts a *very* fragile bank. A depositor run will easily break it, and a run can easily occur, triggered merely by self-justifying worries that others will run. A form of deposit insurance is needed to fix the problem. Many have taken from the model (and from the large theoretical literature built on it) the lesson that *any modern banking system is naturally fragile*. Models depicting banks as naturally fragile seem descriptively plausible to those whose familiarity with banking history is limited to the United States. The United States did have a series of

[1]Taleb (2011a) categorizes "banks" (without qualification as to type) as fragile financial institutions, reserving the robust and antifragile categories to "(some) hedge funds." He does, however, categorize "private debt without bailouts" as robust, so perhaps he only means to categorize *present-day* banking as fragile.

banking panics between 1873 and 1933, and the introduction of federal deposit insurance in 1933 did finally stop that decade's panics.

A more thorough look at theory and empirical evidence indicates clearly that banking is *not* naturally fragile. Theoretically, the fragility result of the Diamond-Dybvig model is itself fragile: it does not survive small modifications that make the model's assumptions more realistic.[2] Calomiris and Gorton (1991: 110) have aptly summarized the evidence from historical studies of banking panics: "The conclusion of this work and cross-country comparisons is that banking panics are not inherent in banking contracts—institutional structure matters."

The view of banking institutions as naturally fragile is implausibly anti-Darwinian. It defies the Darwinian principle of natural selection ("the survival of the fittest"). Given a few centuries, financial institutions that are inherently prone to collapse should be expected to collapse and thereby to disappear over time, while sturdier structures should be expected to survive. The inherent-fragility view of banking cannot explain how modern banking survived, much less how it flourished and spread across the world, as it did for the seven-plus centuries between its emergence around 1200 (Lopez 1979: 12) and the arrival of official safety nets after 1900 in the form of government-sponsored lenders of last resort and national deposit insurance.

Antifragile banking systems can be historically observed under "free banking" regimes where legal restrictions and privileges were at a minimum. Leading cases include Australia, Canada, Chile, the New England region of the United States, Scotland, Sweden, and Switzerland (see Dowd 1992b, Briones and Rockoff 2005). These systems did not have zero bank failures, but they emerged from them chastened and stronger. They fulfill the criteria that Taleb (2012b) enunciated in an interview with CNBC: "What is fragile should break early, and not too late. . . . I want a [banking] system that gets better after every shock. A system that relies on bailouts is not such a system."

A well-known episode provides an example of the resilience of a free banking system. Adam Smith in *The Wealth of Nations* (Book II, Chapter II, para. 73) noted the spectacular rise and 1772 crash of

[2]For reviews of the theoretical and historical arguments over natural fragility see Dowd (1992a), White (1999: chap. 6), and Hogan (2011: chap. 2).

Douglas, Heron & Company, better known as the Ayr Bank, which has been more recently described by Hugh Rockoff (2011) as "the Lehman Brothers of the day." In Smith's words the bank's "design was generous; but the execution was imprudent." Rockoff notes that the Ayr Bank's proprietors approached the Bank of England (at that time a private firm) for bridge financing, but the terms offered were so stiff that no deal was made. The stoppage of credit from the Ayr Bank upon its failure triggered bankruptcies in some other firms, and a "v-shaped" recession ensued lasting about two years. The crash brought down 15 small Edinburgh private bankers but none of the larger banks. In the years following, as Rockoff notes, "the system as a whole was able to recover quickly." The Scottish banking system resumed healthy growth—including the development of the world's most extensive branch banking networks—with evidently greater prudence. A report on the causes of the Ayr Bank crash (published 1778), according to banking historian Richard Saville (1996: 163), provided an influential account of "how to mismanage a bank" and how failure followed when prudent "regulations and rules were flouted." The report "helped to mould opinion" among Scottish bankers that they "should live within their normal incomes." As a result, "There were fewer complaints of incompetent behaviour in respect of provincial banks for the remainder of the eighteenth century" (Saville 1996: 168).

Of course, one example is only suggestive. A more comprehensive study of how free banking systems responded to stresses, including the case of the Australian real estate boom and bust of 1893, would be informative.[3]

Legal Restrictions and Privileges Have Made the Current U.S. Banking System Fragile

In the wake of "the panic of 2007–09," as Gorton and Metrick (2010: 262) call the recent financial crisis, it is clear that today's U.S. financial system is fragile. This judgment does not depend on any particular theory about the causes of the crisis. It does not depend on whether (as commentators from Paul Krugman to Allan Meltzer have said) the system could not withstand the shock of letting

[3]For different views of the Australian case, see Dowd (1992c) and Hickson and Turner (2002). For a synthesis see Briones and Rockoff (2005).

Lehman Brothers close, or whether instead, as Barry Ritholz (2012) recently put it, the Lehman closure "was not the cause of the crisis—it was merely one of the first trailer homes in the park to get blown away by the tornado." Either way, the system proved fragile.

If the Lehman closure was a shock or a shock-amplifier, it was not for natural-fragility reasons but likely for the reason identified by John Cochrane (2009–10: 35): "Once everyone expects a bailout, government has to provide it or else chaos will result." Systemic weakness did not grow from the natural operations of banking but rather from *bailout expectations* built by years of precedent and reinforced by the Bear Stearns bailout weeks earlier. The expectation of a bailout leads bondholders to lend cheaply to large or well-connected banks even where the threat of insolvency is built into those banks' fragile investment strategies. As Cochrane notes, Bear Stearns held "a large portfolio of mortgage-backed securities funded at 30-to-1 leverage by overnight debt." That was a very fragile structure. A moderate decline in the value of mortgages wiped out Bear Stearns' thin equity, at which point "the debt holders refuse to renew their loans and the whole thing blows up."[4] Why did debt holders fund such a structure as cheaply and for as long as they did? In large part because they put a high weight on the likelihood that the Federal Reserve or Treasury would shelter them from the downside risk. They were, in the phrase of Russell Roberts (2010), gambling with other people's money.

As Cochrane observes, to eliminate bailout expectations requires a system in which the government has no legal authority to bail out insolvent firms. Tying the government's hands in that way would actually reduce fragility: "If everybody had known that [Lehman would not be bailed out] ahead of time, rather than have [that knowledge] emerge from the usual weekend conclave in Washington, there likely would have been no panic because Lehman's failure would not have signaled anything about the government's commitments to Citigroup." A key challenge that faces us in developing an antifragile banking system is to find the best way to credibly tie the government to the mast to eliminate bailouts.

It is widely recognized that the Dodd-Frank Act does not credibly end "too big to fail" bailouts. Arthur E. Wilmarth Jr. (2011: 951–52)

[4]Note that Bear Stearns' overnight lenders did not stop lending purely out of fear that others would stop lending (the Diamond-Dybvig scenario), but after bad news created a valid concern (proven correct when the books were examined) that Bear Stearns was already insolvent.

has outlined its weaknesses: Dodd-Frank "allows the FDIC to provide full protection for favored creditors" of the firms it designates as "Systemically Important Financial Institutions" or SIFIs; its "Orderly Liquidation Authority does not preclude full protection of favored creditors of SIFIs;" and it "does not prevent federal regulators from using other sources of funding to protect creditors of SIFIs." Of equal importance, the U.S. financial system is not prepared to withstand losses to the uninsured creditors of even one of the six largest banks (which together have assets totaling around 60 percent of GDP) without major disruption. Thomas M. Hoenig (2010) is no doubt correct in his practical judgment that, "Like it or not, these firms remain too big to fail."

The U.S. banking system has had an unfortunately long history of banking fragility. Before the Civil War, so-called free banking systems—which were *not* laissez-faire but rather state-level regulatory regimes with somewhat freer entry than the chartering systems that preceded them—exhibited instability in some states but worked well in others. Where problems occurred they were due to poorly designed restrictions on banks in those states (Rockoff 1974, Rolnick and Weber 1986, White 1986). Between the Civil War and the First World War, known as the National Banking era, U.S. banks were weakened by continuing state restrictions against branching and by federal restrictions on note-issue (Noyes 1910, Smith 1936, Selgin 1989). Today U.S. banks, and especially the largest banks, are weakened by the legal privileges that create moral hazard—namely, taxpayer-backed deposit insurance, access to artificially cheap Federal Reserve credit, and taxpayer-funded "too big to fail" guarantees against bondholder losses. We will not have achieved robustness, much less antifragility, until no single financial firm is considered systemically critical or too important to close. At that point a credible promise of no bailouts can be made and kept.

But ending "too big to fail" bailouts is not enough. Demirgüç-Kunt, Kane, and Laeven (2006) find in an important cross-country study that "deposit insurance significantly reduces banking stability in countries whose contracting environment is poorly developed, but in stronger environments deposit-insurance schemes have little significant effect on stability." Why? The authors explain: "Protecting against crises and shocks absorbs considerable resources and can easily end up subsidizing bank risk-taking. When such subsidies exist, they foster imprudent banking practices and support inefficient

borrower investments in real resources." The United States ranks as a relatively strong contracting environment, but subsidies that foster imprudent banking practices are evident in the moral hazard consequences of U.S. deposit insurance.

In *The Black Swan*, published before the financial crisis, Taleb (2007: 225–26), pointed insightfully toward the source of our financial fragility: "We have moved from a diversified ecology of small banks, with varied lending policies, to a more homogeneous framework of firms that all resemble one another. True, we now have fewer failures, but when they occur . . . I shiver at the thought." He went on to remark perceptively that "the government-sponsored institution Fannie Mae, when I look at its risks, seems to be sitting on a barrel of dynamite, vulnerable to the slightest hiccup."

Why has the United States moved away from a diversified ecology of banks (which does not, by the way, require only small banks) pursuing varied and well-diversified lending strategies? The fundamental reason is public policy. To cite an early example: Under the "free banking" statutes previously mentioned, state governments typically required banks to invest in a limited range of assets to serve as collateral for banknotes. The banks in Minnesota and Wisconsin failed in droves when the price of Missouri bonds fell, because arbitraging the collateral rules in those states gave the banks strong incentives to overload their portfolios with the farthest-below-par state debt available, which happened to be Missouri's (Rolnick and Weber 1984, White 1986). In the National Banking Acts of 1862–63, the federal government imposed similar collateral restrictions on a national basis, making American banks more uniform. In the 20th and 21st centuries, the rules of the Federal Reserve and the FDIC have homogenized banks' lending policies.

How to Restore Antifragility to Banking

Taleb (2007) warns us about the fragility of what he calls "overoptimized" systems. To an economist the term "overoptimized" sounds self-contradictory, like saying that too much improvement is bad. The term actually refers to systems optimized under naïve assumptions about uncertainties, such as a portfolio strategy that pretends to know all relevant probabilities and coefficients when some are not in fact knowable from the short time series available. Such a strategy is prone to produce catastrophic

results in the face of an unpredicted shock or "black swan" event. For example, an unpredicted event—namely, the unanticipated rise in perceived default risk that depressed the prices of MBS held or guaranteed by Fannie Mae and Freddie Mac—rendered the thinly capitalized government-sponsored agencies insolvent, as Taleb (2007) and Poole (2003) had warned.

The alternative to "overoptimization" in banking is the practice of traditional rules of thumb or heuristics that have stood the test of time. As Gigerenzer (2008: 20) notes, following heuristics does not mean following them blindly. Rules can be critically evaluated to "identif[y] the structure of environments in which specific heuristics either succeed or fail." But even when we cannot yet pinpoint exactly *how* they enhance survival, following rules of thumb that have enhanced survival in the relevant environment is still a prudent strategy.

An antifragile banking system does not require that every single bank adopt an antifragile strategy. It is good if some take promising risks, provided they absorb their own losses. We should be concerned with the *system*, not with any of the component parts. We need to avoid "overoptimization" at the system level, not at the individual bank level. It helps the system survive and even show progress after the failure of any one bank if a variety banks adopt a variety of structures and pursue a variety of strategies.

The wrong tactic for enhancing antifragility is to have a central authority impose uniform rules, for example, one uniform set of "optimally risk-weighted" capital requirements. This is why the Basel I capital accords failed, the more complex Basel II failed, and the even more complex Basel III will also fail to reduce fragility. It would not promote antifragility to extend federal guarantees to shareholders of money market mutual funds, as proposed by Gorton and Metrick (2010). What is needed for an antifragile system is instead experimentation, trial and error, and natural selection. We can foster that by moving to a banking system without restrictions on entry and exit, without portfolio or activity restrictions, without the "too big to fail" implicit subsidy to the creditors of gargantuan banks, and without ordinary deposit guarantees (beyond prosecution of frauds) or other privileges. (The order in which these moves should be sequenced remains a matter for discussion.) Such a system deals with "overoptimzed" banks by letting them fail. Its mantra is: *Let a thousand flowers bloom, but do not artificially preserve even one of them.*

Banking is ecologically rational only when a standard heuristic of the rule of law is observed: the shareholders, creditors, and management who stand to absorb the upside gain must also absorb all the downside loss.

An Antifragile Monetary Regime

In our current monetary system, the creation of basic money (currency held by the public and commercial bank reserves) is centralized. The central bank is the exclusive issuer, which means that we have put all our eggs in one basket. The failure of a single committee (namely, the Federal Open Market Committee) to supply the right quantity of money creates an excess supply or excess demand for money (at the existing price level) that no other issuer can remedy. Under a fiat standard, there is no automatic feedback mechanism for the central bank to home in on the right quantity of money. The public and banks cannot promptly correct an excess supply of base money because they cannot turn it in for redemption. They cannot promptly remedy excess demand because the central bank does not issue more base money at the public's or the banks' initiative. In the long run, the price level will move to clear the market for real-money balances, of course, but only after an inflation or deflation that it would be better to avoid.

Commercial banks in our current system do issue their own "inside money" liabilities in the form of checkable deposits, and are constrained by the public in the ratio of inside money to base money they can create because excess deposits can be redeemed for base money. Nonetheless, as any money and banking textbook explains, banks' deposit volume is not fully market-determined. It is governed by the quantity of base money that the central bank creates, leveraged up by the "money multiplier." The money multiplier is a ratio determined partly by the public's desired ratio of deposits to currency holdings, but also by the banks' desired deposit-to-reserve ratio, which in turn depends on central bank decisions about the interest rate it pays on base money held as reserves and the minimum required reserve ratio it imposes on deposits (which are not always binding). The decentralized feedback that does influence commercial banks does not at all penetrate to the central bank in its decisions about supplying fiat base money.

Fragility in money supply occurs when the policy pursued by the central bank makes money-supply errors self-aggravating (rather

than self-correcting). In the early 1930s, the Federal Reserve System allowed a huge and unrelieved excess demand for money (which arose with monetary contraction connected with bank runs) to grow and to drag down the economy from recession into depression. Fed policymakers mistook low nominal interest rates for evidence that money and credit must be abundant enough, when in fact expected deflation and not credit abundance was responsible for the low nominal interest rate (Wheelock 2010: 99–100, Fishback 2010: 393–94). In the 1970s, the Fed made the same self-feeding error in the opposite direction. It kept expanding the money stock to push high interest rates down, throwing fuel on the fire by driving actual and expected inflation ever higher. The Taylor Rule, under which the Fed raises or lowers its nominal interest rate target to overcompensate for increases or decreases in the actual inflation rate, is designed to avoid this particular central bank error. But the Fed does not consistently adhere to the Taylor Rule.

In recent years the Fed appears to have trapped itself in a new self-feeding error loop. In its efforts to spark recovery it has taken unprecedented measures (near-zero short-term nominal interest rates, purchases of dodgy assets to raise their prices, huge expansion of its balance sheet via QE1 and QE2, interest on reserves, Operation Twist 2) that have contributed to regime uncertainty and thereby have contributed to depressing investment and retarding recovery. The Fed has responded to a continuing weak recovery with still further unprecedented measures (projections of years more of ultra-low interest rates, open-ended QE3, an explicit unemployment rate target combined with an upward shift in the comfort zone for inflation) that have exacerbated regime uncertainty.

Conclusion

Money supply errors are self-correcting rather than self-amplifying in a monetary system that *decentralizes* money issue, letting competing banks issue notes and deposits that would (most plausibly) be redeemable for a basic commodity money like silver or gold coin, in turn produced by competing mines and mints (White 1989). Impersonal market processes, driven by profit and loss, work to remedy oversupply or undersupply. A market-based system fosters macroeconomic stability, as David Laidler (2005) has nicely put the argument, "not because anyone would set such a goal, but because

the self-interested behaviour of the individual banks would generate it." Much has been written about the theory and history of free banking systems that need not be repeated here.[5] But it bears emphasizing that there is a beneficial logic of institutional evolution in monetary arrangements, which is most evident historically where governments have interfered least (Selgin and White 1987).

Our latest episode of banking and monetary fragility in an artificially centralized system, in stark contrast to the antifragility of a decentralized and evolutionarily grown system, gives us good reason to revisit the arguments for separation of money and state.

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[5]For a survey of the 1984–93 scholarly literature, see Selgin and White (1994); for a more recent survey, see Selgin (2010) and White (2012).

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