What Lessons Can We Learn From the Boom and Turmoil?

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Jeffrey M. Lacker
President, Federal Reserve Bank of Richmond

The theme of this conference – "Lessons Learned from the Subprime Crisis" – appears to be a timely one, but there have been several times during the past year when I thought it was a good time to initiate projects to identify "lessons learned," only to discover that the "crisis" was not yet over.[1] I sincerely hope that this conference *does* turn out to be timely, in the sense that we truly are past the peak of the current turmoil.

This episode undoubtedly will inspire a great deal of research in the years ahead, and it may take some time before anything like a professional consensus emerges on causes and consequences. After all, it took several decades to document the causes of the Great Depression, and recent research continues to provide new perspectives.[2] Nonetheless, I believe the central questions that are likely to occupy researchers are plainly in view, and some tentative lessons have emerged already. And in any event, legislators are not likely to await the fruits of future scholarship.

I will divide my discussion into two parts, reflecting two distinct time periods – the boom in housing and housing finance and the subsequent turmoil in financial markets – and then conclude with some thoughts about what lies ahead. As always, the views I will express are my own assessments, and are not necessarily shared by others in the Federal Reserve.

The Boom in Housing Finance

The expansion in mortgage lending that preceded the recent turmoil in financial markets is best viewed as a component of the long boom in housing activity that began in the mid-1990s and peaked in late 2005 and early 2006. Hard work will be required to estimate the quantitative contribution of various causal factors to the rise in subprime mortgage lending and the increase in subprime losses. In the meantime, the list of plausible suspects is reasonably clear. First, real per capita income grew more rapidly in the decade after 1995 than in the decade before. Second, real interest rates were relatively low over this period, especially after the recession earlier this decade. Low real interest rates in part reflected large capital inflows, but the Federal Open Market Committee kept the federal funds target rate low in 2003, and raised rates only gradually starting in mid-2004. Some economists have argued that tighter monetary policy during that period would have

led to better outcomes by preventing core inflation from rising. While I find this view plausible, I believe further research will be required to substantiate this hypothesis.

The third contributing factor was the technologically-driven wave of innovation in retail credit delivery that allowed lenders to make finer distinctions between borrowers. This lowered borrowing costs for many borrowers and expanded the availability of credit to borrowers formerly viewed as unworthy of credit.[3] As in any industry undergoing significant innovation – credit cards in the 1990s are a good example – natural evolution can involve overshooting and retrenchment.

Fourth, the regulatory and supervisory regime surrounding U.S. housing finance probably contributed to the boom in housing and housing finance. Here, several factors deserve mention. Supervisory agencies, like borrowers, lenders and investors, assigned a low probability to the possibility of an adverse housing demand shift of the magnitude and geographic extent that we have seen. Private sector incentives to foresee and protect against such shocks were to some extent dampened by the presence of the federal financial safety net, including the inferred prospect of support for Fannie Mae and Freddie Mac. The safety net probably also played a role in banks' involvement in the securitization process. Banks' use of off-balance sheet arrangements and provision of back-up lines of credit created state-contingent exposures for the banking system that by design were most likely to be realized in generally bad states of the world, when the safety-net protection of the formal banking sector would be most valuable. Official policies aimed at increasing home-ownership also provided at least some positive inducement to risk-taking in housing finance. In addition, the unscrupulous and fraudulent practices of some mortgage brokers outside of the banking sector may have contributed to the problem.

Although the housing boom will, as I said, inspire a great deal of research in the years ahead, some lessons have emerged already and have motivated corrective action, both by market participants and policymakers. The appetite of banks and investors for nontraditional and subprime mortgages and for the services of independent mortgage brokers has been reduced substantially, and many mortgage companies have gone out of business. Banks and mortgage originators have tightened home mortgage underwriting standards significantly, reflecting both revised assessments of the profitability of more innovative lending approaches and a generally weakening economic outlook. Financial market investors that held mortgage-backed securities have been penalized heavily, and have reassessed a range of complex securitization products. The Federal Reserve has tightened standards over unfair and deceptive mortgage lending practices. Supervisory staff have intensified their scrutiny of risk management practices related to structured finance and off-balance-sheet activities, and have worked to strengthen institutions' capital and liquidity planning. And the U.S. banking agencies have worked together with nonprofits and mortgage servicers to prevent unnecessary foreclosures.[4]

Apart from these relatively focused responses, broader questions have been raised about the extent to which policy should attempt to dampen broad swings in credit or asset prices. When a boom in an industry or sector occurs, there is typically uncertainty about

how large and how long that expansion will be. Market participants act on the information and signals provided to them, and this process generally leads to a reasonably efficient allocation of goods and services – and capital. But people can make mistakes in judging market trends, and sometimes similar mistakes are made by many people at once. This can lead to decisions that many later regret, and, arguably, is what happened during the housing boom. One might argue that it should have been obvious that prices had become unsustainably high. But borrowers and lenders – and regulators for that matter – could not have been perfectly certain when the market peak was about to be reached. I am wary, therefore, of attempting to use regulation to dampen swings in credit or asset prices. Such swings are often associated with surges in innovation, so countervailing intervention would inevitably risk suppressing the technological progress that has been so valuable over the years in improving consumer well-being.

The Turmoil in Housing Finance

In the middle of 2007, the potential scale of the home mortgage losses became more widely appreciated, and financial markets have been displaying the effects ever since. Financial market participants have faced three major categories of uncertainty. The first concerns the aggregate amount of losses on mortgage lending. The housing market has yet to bottom and cumulative loss rates still are rising for mortgages made in 2006 and early 2007, so it may be some time before total mortgage lending losses are known.

Second, financial market participants face uncertainty about where the losses will turn up. Mortgage risks were split up and spread widely, both within the United States and Europe, and around the world, through securitization and use of the insurance capabilities provided by credit derivative contracts. Financial market participants thus have been understandably apprehensive about whether a particular counterparty's mortgage-related losses will erode their capital buffer enough to threaten their viability.

Third, market participants have at times faced uncertainty about prospective public sector intervention.[5] The disparate responses to potential failures at several high-profile organizations this year probably made it more difficult for market participants to forecast whether and in what form official support would be forthcoming for a given counterparty. Shifts in expectations regarding official intervention may have added volatility to financial markets that already were roiled by an increasingly uncertain growth outlook. In the absence of clearly understood policy principles governing such actions, markets were left to draw inferences from each successive initiative. Until boundaries around such government actions are delineated, markets will be forced to cope with these additional uncertainties.

A Digression Regarding Walter Bagehot, the Founding of the Federal Reserve, and the Great Depression

Discussions of the role of the central bank as a lender of last resort often appeal to Walter Bagehot's classic prescription: "Lend freely at a high rate, on good collateral." [6] But Bagehot's teachings are not directly relevant to modern central bank lending. Lending by modern interest-rate-targeting central banks is by necessity *sterilized.* By itself, a central bank loan increases both the liabilities and assets of the central bank. The additional reserves would tend to drive the interest rate below the target, so central banks generally sterilize their lending operations via offsetting asset sales.[7] In Bagehot's time, however, unsterilized lending was the only way for the central bank to prevent a spike in interest rates by elastically increasing the supply of central bank money when the demand for it rose in a crisis.[8] In other words, Bagehot's dictum was about *monetary policy* – that is, the *size* of the central bank's balance sheet – not *credit policy,* which alters just the *composition* of a central bank's asset holdings.

Interest rate spikes were a common feature of the many U.S. financial panics in the late 19th century, up through the Panic of 1907. The Federal Reserve was founded in 1913 in order to respond to panic-induced increases in the demand for money by expanding the supply of money through *unsterilized* discount window lending, not the sterilized lending that is common today. Today, central banks respond to increases in money demand through open market purchases, in order to prevent interest rates from rising.

The initial phase of the Great Depression, from 1930 through 1933, saw another financial crisis in which large numbers of banks failed. One popular reading of the history of that time is that aggressive lending by the Fed to prevent those failures could have forestalled or reduced the severity of the downturn in economic activity. The implied lesson is that central banks should lend aggressively in a crisis. The Great Depression continues to be the subject of debate, but I think it is important to note that Federal Reserve policy also brought about a sharp sustained contraction in the price level and quite elevated real interest rates.[9] One could argue, therefore, that the correct lesson to draw from 1930-33 is that the Fed failed to follow the Bagehot prescription for (unsterilized) lending – that is, the Fed did not prevent deflation by lowering interest rates and maintaining an adequate supply of money. In other words, the onset of Great Depression was a failure of Federal Reserve *monetary* policy – that is, interest rate policy – not a failure of Fed *credit policy.* This, of course, is the argument of Milton Friedman and Anna Schwartz in their *Monetary History of the United States.*[10]

The Costs and Benefits of Intervention

The striking feature of central bank lending during the recent turmoil is the extent to which it has extended well beyond the boundaries that previously were understood to constrain such lending, both in the range of institutions and the contractual terms on which credit has been provided. Intervention has been driven by a desire to prevent damaging disruptions to financial markets, and thus reduce the overall costs of the turmoil. While this objective is clearly understandable, central bank lending can create the expectation that similar support will be forthcoming when market disruptions occur in the future. Such expectations can themselves be very costly, because they can distort the

incentives faced by, and as a result, the choices made by private-sector participants. For example, in the past year, expectation of official support may have induced some firms to take the risk of turning down capital infusions or merger offers in hopes of finding better terms in the future. Prospective equity investors may have demanded stiffer terms to compensate for the possibility of dilutive government intervention. Clearly, these contemporary examples of the moral hazard effects are detrimental to public policy objectives.

The critical policy question of our time is where to establish the boundaries around the public sector safety net provided to financial market participants, now that the old boundaries are gone. Such support inevitably distorts the choices of beneficiaries, and costly regulatory and supervisory efforts are required to contain those distortions. A key design consideration, therefore, concerns the offsetting benefits of official intervention in credit markets. Such intervention typically is justified by a desire to prevent or lessen a severe disruption of the market that might result from the unassisted failure of a large financial institution. Such disruptions often are described in vivid metaphors, using terms like "frozen," "clogged," or "dried up." But these are just ways of saying that quantities are lower, and, by themselves, such adjectives are devoid of analytical content. To evaluate the benefits of intervention, we ultimately need to move beyond metaphors and look for clear and coherent descriptions – theories, in other words – of market function and market dysfunction. Future research on the current turmoil and future assessments of current policy will turn on which theories accord best with the observational evidence.

The standard theory of financial markets is based on the notion that markets are a reasonably effective mechanism for aggregating dispersed information about asset fundamentals, so that changes in observed prices correspond to changes in markets participants' beliefs about future payment streams. Under this view, of course, central bank or government intervention that raises the price of an asset represents a subsidy to those holding the asset and drives the price away from the asset's true economic value. The limitations of the standard approach to asset pricing have led to the development of theories built on frictions that cause market prices to deviate from the standard results. Some of these theories have the implication that market performance might be improved by central bank lending or other official intervention.

One commonly cited market malfunction is based on coordination failures that take the form of bank runs, especially runs that have the self-fulfilling property that market participants pull their funds simply because they think that others are doing so.[11] The potential for run-like behavior is thought to extend to short-term debt markets as well. The existence of a lender of last resort or other elements of the financial safety net can prevent such market breakdowns. But I think future researchers are likely to be critical of bank run theories as a motivation for sterilized central bank lending in this particular episode. Runs can also occur as a rational, and sometimes even necessary, response to fundamental deterioration in an institution or the assets it holds. My sense of the accumulated evidence is that it is hard to find examples of purely self-fulfilling runs – that is, runs not plausibly warranted by changing fundamentals.[12] Not all rapid portfolio shifts represent runs that necessitate official intervention. Moreover, financial entities

often can protect themselves from runs by structuring their borrowing arrangements appropriately.

Another type of market imperfection is the notion that asset prices can deviate from their fundamental values when some participants are forced to sell their holdings rapidly (to meet a margin call for example) and are forced to take whatever price is offered, even a price that commonly is known to be much less than the asset's true economic value.[13] The logic of such "fire sale" prices relies on market segmentation, that is, some impediment that prevents the sale to another investor with both the resources to make a purchase and knowledge of the asset's fundamental value. Throughout this turmoil, however, it has been widely known that large amounts of money were "sitting on the sidelines." In this age of integrated global financial markets, I find it hard to envision something – other than those investors' doubts about the value of these assets – that has been artificially impeding investors' entry into the markets for depressed assets.

A broader motivation for public sector support at times like these is the notion that credit market disruptions that reduce the banking sector's capital can impede banks' ability and willingness to extend credit to households and business firms, thereby creating an additional drag on spending and growth. The widely observed correlations between economic activity and measures of bank credit extension lend support to this theory. But causation can flow in the opposite direction as well. When overall economic activity seems poised to contract, the outlook for household income and business revenues deteriorates as well, and such borrowers become less creditworthy, all else constant. My reading of the history of U.S. business cycles is that the direct effect of credit markets on real activity – the so-called "credit channel" – accounts for only a small part of the variation in output over the typical cycle. And my reading of current conditions is that bank lending is constrained more now by the supply of creditworthy borrowers than by the supply of bank capital.

The Path Ahead

As I said earlier, the critical policy challenge for our time is to re-establish the boundaries of central bank lending and public support. In doing so, the prime directive should be that the extent of regulatory and supervisory oversight should be commensurate with the extent of access to central bank credit in order to contain moral hazard effectively. The dramatic recent expansion in Federal Reserve lending, and government support more broadly, has extended public sector support beyond existing supervisory reach, and thus could destabilize the financial system, absent corrective action. Restoring consistency between the scope of government support and the scope of government supervision is essential to a healthy and sustainable financial system. One option is simply to adapt our regulatory and supervisory regime to the new wider implied reach of government lending support.[14] This strikes me as an unattractive option, if for no other reason than the current uncertainty about the outer bounds of that support. Constraining moral hazard in such a regime would be an immense and daunting task. I take it as given, therefore, that the scope of the financial safety net ultimately must be rolled back.

The question then becomes where to establish the boundaries of a combined safety net and supervisory regime. The appropriate answer to that question depends in turn on fundamental questions surrounding the functioning of financial markets. As my remarks suggest, my reading of the research on financial arrangements has left me generally skeptical regarding conjectures of broad financial market dysfunction. This is not because I am sanguine about the inherent stability of less-constrained financial markets, but because it seems reasonable to expect a measure of instability even in reasonably well-functioning markets. Accordingly, I would favor narrower rather than broader public sector support for the financial system.

However the critical scope question is answered, a crucial constraint on the new regime is that it be *time consistent* – that is, a commitment not to provide support beyond the new policy boundaries should be *credible*. My former colleague Marvin Goodfriend and I wrote about this problem 10 years ago.[15] We noted that central banks' implied responsibility for financial stability "can create pressure to expand the scope of central bank lending to nonbank financial institutions." We predicted "a tendency for central banks to overextend lending," and an increase in the rate of financial distress over time "as market participants come to understand the range of the central bank's actual (implicit) commitment to lend."

Professor Goodfriend and I considered several methods by which the central bank might credibly commit to limit lending, and we concluded that there were no effective substitutes for building a reputation for doing so. We noted that the experience by which central banks around the world built reputations for maintaining low inflation provided a road map for how to credibly limit lending. Essential to that process is for the central bank to, at times, disappoint expectations and refuse to lend, even at the cost of short run financial market disruption.

So perhaps the central lesson from recent events is that establishing new safety-net boundaries that are credible and sustainable will be a very difficult task. But finding a way of establishing credible boundaries is essential if we wish to maintain a financial system that includes both institutions that are protected and regulated by the public sector and institutions that are regulated primarily through market discipline. I believe this mix is important to achieving a balance between the safety that comes from government involvement and the innovation that, despite the associated volatility, has added much to the effectiveness of our financial system and to overall economic growth.

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[1] I am grateful to Aaron Steelman, Ned Prescott and John Weinberg for assistance in preparing these remarks.

[2] Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States: 1867-1960.* Princeton: Princeton University Press, 1963; Ben S. Bernanke, "Non-Monetary Effects of the Financial Crisis in Propagation of the Great Depression," *American Economic Review*, June 1983, vol. 73, no. 3, pp. 257-276; and Timothy J. Kehoe and Edward C. Prescott (eds.), *Great Depressions of the 20th Century*. Minneapolis: Federal Reserve Bank of Minneapolis, 2007; Robert L. Hetzel, *The Monetary Policy of the Federal Reserve: A History*. Cambridge: Cambridge University Press, 2008.

[3] For analysis of the effects of this innovation on unsecured consumer credit see Kartik Athreya, Xuan S. Tam, and Eric R. Young, "A Quantitative Theory of Information and Unsecured Debt," Federal Reserve Bank of Richmond Working Paper no. 08-06, October 2008.
[4] See the Federal Reserve System's web site on Mortgage Foreclosure Resources at http://federalreserve.gov/consumerinfo/foreclosure.htm.
[5] See my remarks to the European Economics and Financial Centre, London, England, June 5, 2008.
[6] Walter Bagehot, Lombard Street. London: Harry S. King and Co., 1873.
[7] Federal Reserve Bank discount window lending before the recent turmoil was typically an overnight loan extended late in the day, and was generally unsterilized. These interventions can be viewed as responding to unanticipated end-of-day increases in the banking system's net demand for reserve balances. ending for extended periods requires offsetting reserve drains in order to maintain the federal funds rate target. Until recently, all of the new lending programs introduced by the Federal Reserve have been sterilized. The Federal Reserve Banks new authority to pay interest on reserves means that interest rates generally ought to remain above the interest rate on reserves even if lending is not sterilized. The interest rate on reserves is currently set equal to the Federal Open Market Committee's federal funds rate target.
[8] Marvin Goodfriend and Robert G. King, "Financial Deregulation, Monetary Policy, and Central Banking," Federal Reserve Bank of Richmond *Economic Review*, May/June 1988, vol. 74, no. 3, pp. 3-22.
[9] James D. Hamilton. "Was the Deflation During the Great Depression Anticipated? Evidence from the Commodity Futures Market," *American Economic Review*, March 1992, vol. 82, no. 1, pp. 157-178; and Stephen G. Cecchetti, "Prices During the Great Depression: Was the Deflation of 1930-32 Really Unanticipated?" *American Economic Review*, vol 82, no. 1, March 1992, pp. 141-156.
[10] Friedman and Schwartz.
[11] See citations in my remarks to the European Economics and Financial Centre, London, England, June 5, 2008.
[12] Charles W. Calomiris and Gary Gorton, "The Origins of Banking Panics: Models, Facts, and Bank Regulation," in Financial Markets and Financial Crises, R.G. Hubbard, ed. Chicago: University of Chicago Press, 1991; George G. Kaufman, "Bank Contagion: A Review of the Theory and Evidence," *Journal of Financial Services Research*, April 1994, vol. 8, pp. 123-50.
[13] Franklin Allen and Douglas Gale, "The Role of Liquidity in Financial Crises," 2008 Jackson Hole Conference, Federal Reserve Bank of Kansas City.
[14] One class of adaptations that would be worth pursuing is to alter failure resolution arrangements to make them less disruptive, thereby reducing the pressure for central bank lending. See Gary H. Stern and Ron J. Feldman, *Too Big To Fail: The Hazards of Bank Bailouts*. Washington: Brooking Institution Press, 2004.
[15] Marvin Goodfriend and Jeffrey M. Lacker, "Limited Commitment and Central Bank Lending," Federal Reserve Bank of Richmond *Economic Quarterly*, Fall 1999, vol. 85, no. 4, pp. 1-27. See p. 15 for the quotes that follow.