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Are We Safer?
The Case for Strengthening the Bagehot Arsenal

Timothy F. Geithner

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Is the financial system safer today?

With the reforms now in place and with the memory of the crisis still fresh, how confident should we feel about the resilience of the financial system and our ability to protect the U.S. economy from a major financial crisis?

This is important because, though we may not face the threat of a major crisis soon, at some point we are certain to.

The choices we make in advance of that event, and in the moment, will have a major impact in determining the magnitude of the economic damage. Our vulnerability to crisis depends of course on the strength of the protections we build into the financial system through prudential regulation. But it also on the degrees of freedom we create for ourselves to respond to the unanticipated, and the knowledge and experience we bring in managing crises.

It's just as in medicine, where protecting the health of individuals and the public depends not just on immunizations, nutrition, and regular checkups, but also on hospitals and emergency care, and the skills of doctors and nurses.

Or as in national security, where the defense of the nation depends not just on diplomacy, espionage, moats and castles, but also on armies, with an arsenal of weapons and a tradition of constant training and the study of the conduct of war.

The challenge is both in the prevention and the response.

War metaphors should not be applied beyond war, but when thinking about strategy in financial crises, there is some wisdom in the saying attributed to Plato and Sun Tzu, "if you want peace, prepare for war."

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It's important to begin with some observations about how financial systems work, and what makes them vulnerable to crisis.¹

First, and most important, financial systems are inherently fragile. By fragile, I mean vulnerable to panics and runs.

The fundamental causes of this financial fragility are debated. One might conclude from the heat of the debate that we don't know that much about this problem. I don't think that is true. We know a lot.

The fundamental source of fragility in financial systems is the combination or interaction between two needs in a modern market economy: the desire for safe money-like stores of

¹ Thank you to the following individuals for their thoughtful comments on the text: Andrew Metrick, Chase Ross, Ted Truman, Lee Sachs, Meg McConnell, Matt Kabaker and Jake Siewert.

value and the need for funding for long term, illiquid, risky investments and purchases. This creates the need for maturity transformation, or what Mervyn King calls the “Alchemy of Finance.” This can take many forms, constantly shifting forms, encouraged by moral hazard and regulatory arbitrage, and stimulated in periods of exuberance.

Maturity transformation is an inherent feature, and a valuable feature, of the financial system, but it’s also what makes the financial system inherently vulnerable to runs.

This is particularly dangerous in periods that combine a large increase in wealth or savings with optimistic beliefs about the economy; beliefs for example that the economy is safe, risk assets will rise in value, liquidity is freely available, etc. We seem tragically vulnerable to occasional periods of mania, though it can take a long time for the dangerous manias to recur in the same country.

This dynamic fuels demand for money-like short-term liabilities, and lowers the perceived risk in financing long-dated illiquid assets. These liabilities are dangerous because they are *runnable*. The amount of these runnable liabilities can be very large, even in systems where there are large capital cushions and insured deposits.

This is the essential function of “banking”, and the fundamental source of financial instability. It presents a sadly familiar set of perils when this happens in regulated and protected banks. It creates more complicated perils when it happens on a large scale not just in banks, but in other types of financial institutions and funding vehicles, outside of the perimeter of regulation and the safety net, as it did in the United States before this crisis.

Second, systemic financial shocks – the shocks which involve panics and runs – are fundamentally different and more dangerous than other types of financial shocks – such as an idiosyncratic shock involving the failure of a single large financial institution, or a fall in stock prices that is not accompanied by a broader fall in other risk assets, or the financial losses that accompany a modest recession.

Panics and runs are dangerous, not principally because of the damage they cause to individual financial institutions, but because they can precipitate the vicious spiral of fire sales and a contraction in credit that threaten the stability of the financial system and push the economy into recession. Panics are different because the policies required to break them are fundamentally different from the policies that are appropriate in response to a typical idiosyncratic financial shock or modest recession.

Kindleberger’s title was not *Manias and Panics*, it was *Manias, Panics, and Crashes*. The history of financial crises is not just about what causes manias and sparks panics, but how panics tend to turn into *crashes* or economic depression. Manias tend to recur, but they don’t inevitably end in panic; and panics, though scary and dangerous, don’t inevitably end in catastrophe. Much of what determines the severity of the outcome is

the quality of policy choices made in the moment.

In conditions where potential or expected losses on assets are very large, there will be uncertainty about the incidence of those losses across banks and other issuers of short-term liabilities. This uncertainty can lead to a general reduction in funding for a broad range of financial institutions. And this loss of funding can force those institutions to liquidate assets in a fire sale at prices that, if applied as a measure of asset quality across the system, will appear to make large parts of the financial system insolvent. This dynamic is not self-correcting. Left unchecked, it will simply accelerate.

The dynamics of contagion are not fully knowable, or mappable, *ex ante*. To paraphrase Rudi Dornbush, runs happen gradually and then suddenly.² Their characteristics and severity depend on how things evolve in the event, and on the response of policy. This is not principally about the first round effects of direct losses from a given default on counterparties of the weakest firms, or even about the inter-linkages among them, though these can be important. The dynamics of contagion are driven by an increase in perceived default risk on financial institutions. Although the degree of exposure varies across institutions, all financial firms are exposed to the risk of runs and to the perils of losses in a deep recession. This is why policy, and the expectation of policy, relating to the perimeter of support from the central bank and the fiscal authorities, are so important to the dynamics of runs.

Once the run starts and the risk of financial collapse increases, the existential challenge is to break the panic by reducing the incentive for individuals to run from financial institutions and for financial institutions to run from each other. Absent steps to arrest this adverse dynamic, a broader collapse in the financial system becomes almost inevitable.

Third, there is no way to protect the economy from a failing financial system without deploying public resources—without temporarily substituting sovereign for private credit.

No financial institution can self-insure against the 100 year flood – the collapse of the financial system, or the unimaginable or the forgotten risk of a great depression. When the financial system is in the midst of panic or on the edge of the abyss, only the government and the central bank have the ability to arrest the panic and prevent collapse.

In a panic, there will be no source of private funding or equity capital available at an economic cost or on a scale that can substitute for the resources of the State. You can choose to let the panic play out and allow the financial system to collapse and the economy to fall into depression. But if you want to avoid that outcome, you have to recognize that only the government has the ability to arrest a general panic, to offset the collapse in private demand, and to preserve the functioning of the credit system that is a necessary foundation for economic recovery.

² [PBS Frontline \(1997\)](#). Interview with Rudi Dornbusch.

We can wish this were not so. We can reduce the probability that this is ultimately necessary. But we cannot eliminate the inherent fragility of financial systems and the essential reality that their survival in some states of the world requires extraordinary intervention in the financial system by central banks and governments.

Matt Levine, channeling Gary Gorton³, calls this the deep fragile magic of banking:⁴

The deep fragile magic at the heart of banking is that a bank funds its risky assets by issuing risk-free money-like liabilities. At its most basic level – Bailey Brothers' Building & Loan takes deposits and makes mortgage loans – this is good and simple and well-understood and socially useful. But even there it is a fragile magic: If all the depositors want their money back at once, it's a disaster. We know that's a problem, we have known that for decades, and for traditional banking we have solved the problem.

We have the Federal Reserve as lender of last resort, and the Federal Deposit Insurance Corp. as a deposit insurer, to prevent traditional runs on traditional banks from being a problem. We have in essence made banking a public-private partnership: Risk-free money claims are socially useful, and productive loans are socially useful, and private bankers have the right skills and incentives to make the loans, while the government and the central bank have the credibility to guarantee that the claims are risk-free.

This is the core of the moral hazard dilemma. It's why we use regulation to constrain risk. And it is why it is so hard, in designing the framework for emergency assistance, to find a balance, between establishing credible recourse to a contingent backstop in extremis, and avoiding the expectation that equity investors and creditors of financial institutions will be fully protected against loss.

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To recognize these inherent sources of fragility does not mean that nothing can be done to make the system safer. A lot can be done, has been done, and could still be done.

How should we define the objective? What type of stability should we aspire to achieve? What level or quality of safety is desirable?

The objective should not be to eliminate the risk of failure of banks or large institutions.

Failure has its merits. It's important for incentives, for innovation, for efficiency.

What we should care about is the resilience of the broader financial system and its vulnerability to runs and panics. The objective of policy should be to reduce this vulnerability. What is critical is that the financial system remains able to perform its

³See, for example, Gorton (2016). "[The History and Economics of Safe Assets](#)." NBER Working Paper.

⁴Levine (2016). "[Regulators Want to Slow Runs on Derivatives](#)." Bloomberg.

basic functions of the provision of payments, clearing, and settlement services, credit and risk transfer, even in conditions of extreme stress.

To put it differently, we should be trying to build a system in which an idiosyncratic event does not, through the damaging cycle of panic and runs, transform itself into a systemic crisis. This means our ambition should be not only to reduce the probability of financial distress, but to increase the probability we can protect the real economy from distress.

Larry Summers put it nicely once in saying we want to build systems that are “safe for failure.”⁵

Against that general standard, how should we evaluate the resilience of the financial system today? I am going to focus mostly on the United States, in all its special complexity, but these observations have broader relevance.

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Comprehensive Framework for Crisis Management

Shock Absorbers	Keynesian Policy Room	Bagehot Arsenal
- Capital buffers	- Fiscal policy	- Lender of last resort for banks
- Stable funding	- Monetary policy	- Broad-based lending to non-banks
- Margins in repo and derivatives	- External reserves	- Institution-specific lending to non-banks
		- Market funding backstop
		- Guarantees
		- Capital
		- Resolution

To try to answer the question “Are we safer?” it is important to look at three different dimensions of the question.

First, what do we know about resilience of the financial system today – the amount of “dry tinder” in terms of the scale of runnable liabilities and the amount of loss absorbing private capital relative to potential losses in an economic downturn?

Second, what is the strength of the Keynesian arsenal; in terms of fiscal capacity to absorb losses and back stop the financial system, the room to use fiscal resources to

⁵ Summers (2010). “[Financial Stability: Retrospect and Prospect](#).” Remarks at the Stanford Institute for Economic Policy Research.

cushion the fall in private demand, and the scope for monetary policy to lower interest rates?

And third, what is the quality of firefighting arsenal and the available knowledge and skill in deploying those tools?

Ex ante Vulnerability to Crisis

The tragic history of financial crises suggests the ex-ante vulnerability of the system depends on (1) the size and duration of the credit and asset-price boom and how those booms are financed, and (2) the degree of conservatism in the existing prudential safeguards—the regulatory constraints on leverage and maturity transformation.

What do we know about those two things today? Humility in the face of all we missed in the past would say, “Not much.” Meg McConnell at the New York Fed likes to say we spend a lot of time looking for systemic risk, but it tends to find us.

Still, we know some things.

Given the role of manias in sowing the seeds for crisis, it is worth starting with the reality that in 2016 the memory of the global financial crisis is still powerful.

If you take the Minsky view that “stability breeds instability,” then the prevailing fear should be reassuring. A world worried about the approaching abyss is a safer world than a world with less fear, like in 2006. From this perspective, we do not appear to have in the United States today the classic ingredients of a looming major crisis or financial panic.

Short Term Funding

A combination of scars from the crisis and regulation have reduced the amount of dry tinder in the U.S. financial system in terms of runnable liabilities financing risky and illiquid assets. More bank assets are funded by deposits, and fewer with wholesale, unsecured debt: deposits now represent 86% of U.S. banks’ total liabilities, compared with 72% in 2008.⁶ Recent research at the Federal Reserve estimates runnable liabilities in the U.S. have fallen by roughly 20% of GDP from 2008 to present.⁷ The duration of liabilities of banks is longer. The total size of the repo market is much smaller, the assets financed much safer, the haircuts more conservative, and the amount of repo financed overnight is much smaller.⁸ Securities lending is down substantially: the daily average volume of securities lending has fallen from \$2.5 trillion to \$1 trillion between 2008 and

⁶ FDIC (2016). [Historical Statistics on Banking, Table CB14](#).

⁷ Bao, David and Han (2015). “[The Runnables](#).” FEDS Notes.

⁸ For a time series of net repo funding to broker/dealers and banks based on Flow of Funds data, see Gorton and Metrick (2015). “[Who Ran on Repo?](#)” NBER Working Paper.

See also: Buehler, Noteboom and Williams (2013). “[Between Deluge and Drought: The Future of US Bank Liquidity and Funding](#).” McKinsey Working Papers on Risk.

2015.⁹ Uninsured deposits in banks have risen, replacing other less stable forms of funding. Whole classes of funding vehicles with maturity mismatch, SIVs and VRDNs, for example, were washed out in the crisis, and have not reemerged.

Capital Buffers

The post crisis financial reforms have produced much higher capital buffers, and more conservative approaches to measuring the risk in credit and trading assets. If you take into consideration changes to both the numerator and the denominator of regulatory capital ratios— to what counts as capital and to the risk weights applied to assets—capital requirements are five to ten times higher than before the crisis.¹⁰ The quality of capital, now predominantly common equity, is much better in terms of loss absorption. The systemic capital surcharge applied to the major global banks is an important feature of the new regime, effectively forcing them to internalize more of the systemic externalities they threaten in failure, and providing good reinforcement to other efforts to limit scale and size. U.S. banks have raised roughly \$500 billion in common equity since the end of 2008, bringing total equity capital in the banking system to about \$1.7 trillion in 2016.¹¹

The improvements in capital are the achievement of both the stress test regime applied in the crisis, and its extension to the post crisis reforms to prudential regulation. For the U.S., the new regime means that the large firms could probably sustain losses greater than those sustained in the Great Depression and have enough capital to operate. The margin above the losses sustained in this crisis (which were about half those of the Great Depression as a percent of bank assets) is substantially greater.

In many countries outside the United States, you can point to similar reductions in bank leverage.¹² The new capital requirements are not applied evenly across countries but even with the variation in application of the rules, the amount of capital relative to risk is substantially higher than before the crisis. Because the financial systems of other developed economies are overwhelmingly bank centric, in the sense that banks provide most of the credit to the economy, the higher overall levels of bank capital in many of those countries should provide a greater level of comfort about the resilience of the overall financial system. Of course, there are countries where less progress has been achieved and concerns remain about the overall level of capital.

⁹ Baklanova, Copeland and McCaughrin (2015). “[Reference Guide to U.S. Repo and Securities Lending Markets](#).” Federal Reserve Bank of New York Staff Reports. Figure 9.

¹⁰ “Capital requirements for banks are much higher, as are risk weights and the quality of bank capital. In all, new capital requirements are at least seven times the pre-crisis standards for most banks. For globally systemic banks, they are more than ten times.” Carney (2014). “[The Future of Financial Reform](#).”

¹¹ FDIC (2016). [Historical Statistics on Banking, Table CB14](#).

¹² IMF (2013). “[Global Financial Stability Report](#).”

The Broader Perimeter of Capital Requirements

Perhaps as important as the fact that the capital requirements are much more conservative, the perimeter of prudential safeguards in the United States is much broader than before the crisis and the subsequent reforms.

Before the crisis, prudential limits on leverage only applied to banks and somewhat less effectively to the affiliates of bank holding companies, which together accounted for about 35 percent of credit to the household and corporate sector. No effective limits on leverage were applied to the rest of the financial system and entities such as the GSEs, investment banks and broker dealers, non-bank financial institutions like GE capital or AIG, or money market funds.

Today, the largest investment banks are regulated as bank holding companies, with consolidated risk based capital requirements. The number and total size of investment banks or broker dealers that are not affiliated with banks and are not subject to the bank holding company regime are much smaller. Major insurance companies like AIG that played a large role in selling protection to the financial system as a whole and were exposed to significant funding demands through margin calls, are smaller and now subject to some form of consolidated prudential supervision. The GSEs are effectively fully backstopped by the Government. Money market funds are subject to somewhat more exacting regulatory requirements designed to improve disclosure, to limit the amount of risk they can assume, and to limit the risk of runs.

Migration Defenses

The post crisis reforms in the United States now include a range of authorities to help contain sources of systemic risk outside of banks and to limit the very substantial arbitrage opportunities available in the U.S. system.¹³

These authorities include:

- The ability to extend the perimeter of capital and prudential regulation to non-banks through designation.
- The authority to regulate classes of financial activities that might give rise to systemic risk.
- The ability to impose margin requirements on derivatives, repo, and securities lending.

¹³ For additional details, see Adrian and Ashcraft (2012). “[Shadow Banking Regulation](#).” Federal Reserve Bank of New York Staff Reports.

- The mandate given by the Financial Stability Oversight Council to encourage functional regulators to impose new or stronger prudential safeguards on non-bank financial firms.
- The capital charges applied to back up lines of liquidity support.

Macro-prudential Experimentation

Along with the greater conservatism in the prudential safeguards applied to the banking system, there is now more experimentation with other ways to lean against credit booms and the buildup of leverage in parts of the economy, particularly outside the United States. This new wave of “macro prudential” measures in other countries includes higher or dynamically adjustable down payment requirements for mortgages, supervisory limits on specific types of credit exposures, higher transaction taxes on real estate purchases, and many others. We don’t know how effective these will be, and they come with costs, but it’s good that we are in a period of greater experimentation in testing ways to lean against credit and financial booms.

Together, this mix of stronger shock absorbers means that the major financial institutions are better able to absorb losses. This should help limit the risk of contagious runs on financial institutions. And this means that a given measure of macroeconomic policy would be more powerful in the context of a fall in demand, since the financial sector would be stronger. Banks would be less likely to amplify the shock, by being forced to pull back on lending because of inadequate capital. And the transmission mechanism for monetary policy should be more resilient.

These are powerful benefits.

Limitations of the Reforms

There are, however, other, less reassuring, features of the financial world today, and these should make us more careful in claiming too much about the potential benefits of financial reform to date.

The new capital cushions seem large relative to the losses we experienced in this crisis, but those losses were limited by the scale of the monetary and fiscal response and our success in breaking the panic relatively early in the crisis. Losses would have been much greater without that degree of macroeconomic policy room for maneuver.

The new capital requirements, and new limitations on activities, have induced some of the typical migration of intermediation away from banks to institutions and funding vehicles less constrained or unconstrained by regulation.

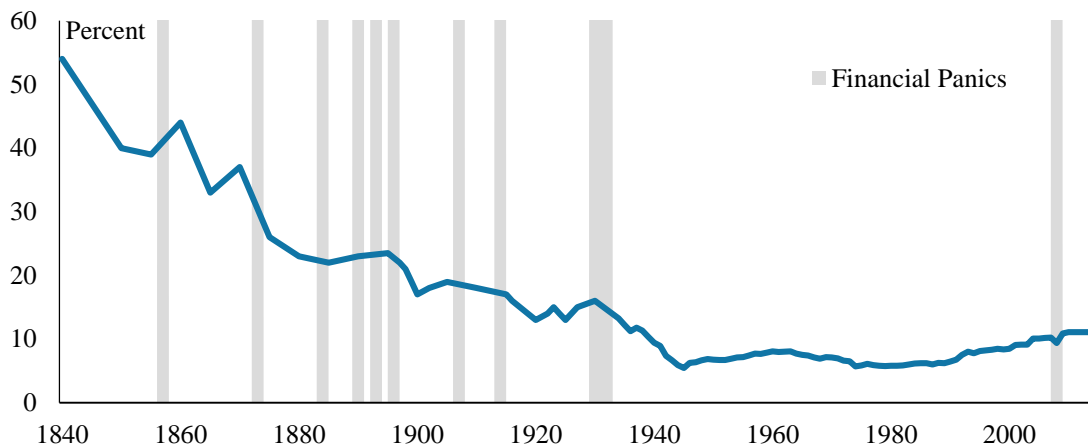
This process of risk migration is not that advanced in the U.S., and we should expect it to happen gradually until we have more distance from this past crisis. Bank capital requirements, when they move beyond some measure of the market’s view of economic

capital, will move more risk outside the financial system, and shrink the market share of banks. This can take a long time to happen on a scale large enough to matter, but it's inevitable.¹⁴ Banks are dangerous, of course, but they are easier to stabilize in a crisis, so shrinking the market share of banks through regulation can make the financial system less stable rather than more stable.

It's worth remembering how much migration took place away from banks in the United States in the decades before this crisis, even with what we now consider very thin capital requirements. In periods of relative economic calm, the opportunities for arbitrage are very sensitive to very small differences between regulatory capital and the amount of capital the market believes has to support certain types of activity.¹⁵ Regulation can adapt, but it will always be behind the curve.

History is also not that reassuring about the value of even much higher capital ratios than we have today as protection against panics. The United States in the five or so decades before the Great Depression had an appalling number of enormously damaging banking panics even with very high prevailing bank capital ratios. This was before the modern Fed and before deposit insurance, but it's a good reminder that creditors to banks tend to run, and that lots of money-like claims can run.

Book Equity to Assets of US Banks Since 1840 and Financial Panics



Source: Book equity to assets data compiled by Hansen, Kashyap and Stein (2011) "[A Macroprudential Approach to Financial Regulation](#)." Journal of Economic Perspectives. Panic dating and pig iron data compiled by Gorton (1988). "[Banking Panics and Business Cycles](#)."

¹⁴ For example, [Gorton, Lewellen and Metrick \(2012\)](#) show the components of safe-assets changed over a 30 year time window, with bank deposits constituting 70 percent of the safe-asset share in the 1970s, but falling to 27 percent before the financial crisis as money market mutual funds, broker-dealer commercial paper, securitized debt from GSEs and other ABS grew.

¹⁵ [Duca \(2016\)](#) examines the linkage between higher capital requirements and the shadow-bank share of short term business credit in the U.S. over many decades. At a shorter horizon, [Xie \(2012\)](#) documents the increase of ABS/MBS and ABCP issuance on a daily basis when expected convenience yield is high. [Sunderam \(2014\)](#) finds a similar phenomenon on a weekly basis, which suggests investors regard shadow bank debt as money-like.

And a final note of caution. I don't think we have any reason to be more confident today than we were in the past about our ability to pre-emptively defuse financial booms or predict or preempt financial "shocks." Maybe we will get better. It is worth trying to get better. Central banks, the BIS and the related committees and fora, and the IMF, have made huge investments in financial stability units that produce a much larger quantity of cool charts and "heat maps" that try to identify systemic risks and potential early warning indicators. But financial crises are not forecastable. They happen because of the inevitable failures of imagination, the limitations of memory, the fact that it is hard to be aware of all our biases and mistaken beliefs.

Financial reforms cannot, by definition, give us protection against every conceivable bad event. So, it is important to recognize that the overall safety of the financial system and our ability to protect the economy from financial distress depends on things other than capital and liquidity regulation.

The State of the Keynesian Arsenal

A nation's ability to limit the intensity of a financial crisis depends critically on its macroeconomic policy room for maneuver. Does the government have the ability to temporarily expand borrowing to support demand? Are its fiscal resources large enough to backstop the financial system and absorb the potential losses? Can it do so at relatively low interest rates? Can the central bank reduce nominal and real interest rates by enough to offset the collapse in demand? How far are nominal interest rates above zero? Does it have room to expand its balance sheet and the authority to accumulate longer duration and higher risk assets?

Today, the state of the Keynesian arsenal is much weaker in most of the major developed economies.

- Public sector debt burdens are much higher as a share of GDP.
- Policy rates are close to or below zero.
- The long end of sovereign yield curve is very low, and close to or below zero in many developed economies.
- Credit spreads are low.

The margins central banks typically operate on are very compressed. They could potentially be pushed lower in some markets, but they don't have far to go.

The experience with negative rates so far is not that promising. There is justifiable doubt among many central banks about whether the impact of the experience to date has been positive or negative. And even those central banks that seem to believe that the impact so

far has been positive, do not seem confident they can go much further without risk of doing damage to their objectives.

There is conceivably more room on the fiscal side in many economies, but much less room than before the crisis. And where there is room, the political constraints in using that room may prove hard to overcome.

The only remaining untried Keynesian frontier is a more coordinated deployment of fiscal expansion and accommodative monetary policy. Perhaps that will prove possible, and if possible, perhaps the impact will be more powerful than what has been attempted to date. But we don't know.

In United States, and perhaps in Europe and the United Kingdom, the central bank balance sheet could in a crisis be expanded further as a share of GDP. Long rates in the United States could be induced lower.

Just for context, the Federal Reserve reduced the Fed Funds rate by 400 to 500 basis points in the relatively mild recessions that preceded the recent crisis. In this crisis, the Fed reduced short term nominal interest rates by 525 basis points between the summer of 2007 and when it got effectively to zero in the fall of 2008, but of course then went considerably further in expanding the balance sheet.

In the United States, the public debt to GDP ratio increased by 40 percentage points of GDP, from roughly 35 percent in 2007 to 75 percent at the end of 2009. Most of this increase was the impact of the recession on lost revenues and the cost of the automatic fiscal stabilizers, which would have been much greater without the positive impact on growth of the fiscal stimulus and the financial rescue. The financial rescue earned a modest positive return for the public, rather than costing five to ten percent of GDP, which was the expectation of many at the time and the typical range for financial rescues in other countries. The stimulus was designed to be temporary. And it was unwound quickly. The federal deficit was reduced from the peak of ten percent of GDP in 2009 to around three percent, where it has now been for a few years. The debt to GDP ratio remains close to the post crisis peak, and will begin rising, absent new policy changes, in the coming years.

Even though the United States still has some remaining room to maneuver, it has much less room than on the eve of any of the previous economic downturns of the last century.

I don't believe we have any precedent for the present diminished state of the Keynesian arsenal. We have not had any experience navigating through a substantial shock to private demand without the ability to lower real rates quickly. Most of the burden in responding to a crisis would have to fall on fiscal policy, where the political constraints on action still seem daunting.

The implications of this are very troubling.

The incremental room available to policy makers in most “advanced” economies to respond to future crises is dramatically more limited than in 2008. This seems likely to be true for a long time.

This means the impact of a given shock could cause more damage, last longer, and will spread wider.

The extent of the progress on capital buffers should be evaluated against this reality of a weaker Keynesian policy arsenal. And the weaker policy arsenal means we have less room for error in management of panics. Of course, there tend to be errors in the management of panics.

Post Crisis Changes in the Firefighting Arsenal

During this crisis, there was a lot of innovation in the design of emergency facilities to prevent the collapse of the financial system and limit the impact of financial failure on the real economy.

In the United States, like many other countries, we acted way beyond the frontiers of historical precedent and ultimately had to legislate dramatically more powerful emergency authority.

We expanded Bagehot’s frontier of the lender of last resort, providing funding not just against a broad range of collateral held by a broad range of institutions, but backstopping a broad array of market funding vehicles, including commercial paper and asset backed securities; we purchased a broad range of GSE sponsored mortgage backed securities.

We effectively guaranteed the liabilities of banks, bank holding companies, the GSEs, and the value of a large share of money market funds.

We provided huge swaps lines to foreign central banks, and helped mobilize a substantial increase in resources for the IMF and the multilateral development banks.

We closed hundreds of banks and facilitated the restructuring of a number of very large complex financial institutions.

We provided a range of different types of capital and loss sharing mechanisms to banks and non-banks.

A key lesson in this is that “success” in breaking the panic and preventing the collapse of the financial system ultimately required not only the full use of the lender of last resort but the substantial use of fiscal resources in the form of guarantees and capital infusions. The full use of the Fed’s ability to lend against collateral, and the FDIC’s ability to resolve banks, were not enough.

To update the Bagehot's tool kit for financial crisis in a modern financial system, a credible emergency regime has to include:

- The ability to provide funding across the financial system, where ever there are runnable liabilities on a scale that matters.
- The ability to guarantee the liabilities of the core of the financial system.
- The ability to recapitalize the financial system, including with public resources, if necessary.
- The ability to resolve, or to liquidate in an orderly manner, large complex financial institutions.
- And the ability to provide dollars to the world's central banks and to lend to foreign financial firms with large dollar liabilities.

This mix of authorities and tools need to be conceived as a whole, an integrated framework that needs to be deployed together, in coordination. With this in place, the policy maker has greater degrees of freedom to allow failure without precipitating a panic; to recapitalize the core part of the system before it is too late and the only alternatives are full nationalization or financial collapse and liquidation.

The financial reforms put in place in the United States after the crisis have substantially changed the tools available to deal with a future crisis. Many of the emergency authorities so critical in 2008 and 2009 were allowed to lapse, were taken away, or were subjected to new constraints that did not exist before the crisis. The reforms were designed to limit the discretion available to the Fed, the FDIC, and the Treasury to act in a future crisis, without new legislation from the Congress.

The Fed retained some of its pre-crisis lender of last resort instruments and authority, including the traditional discount window facilities for banks, but because of the limited role of banks in the U.S. financial system relative to non-banks and direct forms of credit, these traditional bank centric tools have limited power relative to the typical reach of other central banks.

This means we live with a large mismatch in the U.S. financial system between the incidence of runnable liabilities and reach of the standing safety net – deposit insurance, the discount window, and the Federal Home Loan Bank system (which provides discount window like lending facilities for some banks). The coverage of the standing lender of last resort facilities (only for banks) is not aligned with the extent of maturity transformation in relatively large important institutions (bank and non-bank intermediaries and market funding instruments). This gap is much more dramatic in the United States than in in universal banking systems, not just because of the more limited role for banks, but because we limit the ability of banks to fund non-bank affiliates, and

therefore we limit the ability of banks to extend the benefits of the explicit safety net to their broker dealer and specialty finance affiliates.¹⁶

The Federal Reserve can lend freely to a solvent bank against essentially everything the bank has, but it has very limited power to buy financial assets. Its purchase authority is limited only to U.S. Treasuries and agency securities. This is narrow relative to the standard of other central banks, which typically can buy a broader class of financial securities, including obligations of private companies, and even in some cases equities.¹⁷

The Federal Reserve has the authority to lend to non-banks in conditions of crisis, but only when they are close to or past the point of no return. The language in the statute requires, not just a finding of risks to the stability of the financial system, but a judgment that there is no alternative private source of funding available to the non-bank experiencing stress. This means that the Fed cannot lend at the relatively early stage of a market wide funding problem, only when it has escalated to the point of grave peril.

This was true before the reforms, and this restriction was left in place. The new reforms, however, prevent the Federal Reserve from lending to individual non-banks, and allow it only to provide generally available facilities. It can now only provide funding to a class of non-banks, not to individual non-banks. This was designed to make it hard if not impossible for the Fed to undertake the types of programs it did to facilitate the acquisition of Bear Stearns by JPMorgan Chase and to prevent AIG's failure.

In addition, the reforms included new disclosure requirements to the Congress that require reporting within seven days to the relevant committee chairs and ranking members of any borrowing by any individual institution. Fear that this information might end up in the public domain and therefore exacerbate any funding problem is likely to limit recourse to the Fed's lending facilities, at least early in the arc of a liquidity crisis. If the crisis intensifies to the point that funding pressures are acute and affect a broad class of institutions, then the risk of stigma might diminish. But these disclosure requirements will limit the precautionary or preemptive value of the lender of last resort tools.

¹⁶ Section 23A and 23B of the Federal Reserve Act "limit the risks to a bank from transactions between the bank and its affiliates and limit the ability of a bank to transfer to its affiliates the subsidy arising from the bank's access to the Federal safety net." Section 23A identifies eligible transactions between a bank and any single affiliate of the bank, and Section 23B requires that certain transactions between a bank and its affiliate occur on market terms. The Board of Governors of the Federal Reserve may waive these requirements, by a vote of the governors, if such an action would be in the public's best interest. See Federal Reserve (2003) "[Adoption of Regulation W Implementing Sections 23A and 23B of the Federal Reserve Act.](#)"

¹⁷ [Lenza, Pill and Reichlin \(2010\)](#) compare the Federal Reserve and ECB's initial interventions during the Global Financial Crisis in the context of their institutional design differences. With its foundation in the pre-Monetary Union period, the ECB could regularly transact with a wider set of counterparties and securities, which notably included ABS. Pre-crisis, almost 2,000 credit institutions could participate in weekly ECB operations, compared to the U.S. system with a few dozen primary dealers which participated in regular daily operations. As a result, the ECB's main refinancing operations before the crisis averaged EUR 300 billion, whereas the Fed's routine refinancing operations averaged about \$30 billion.

Finally, the Fed is now subject to new limits on how much risk it can take in its lending operations. In general, the Fed's authority is designed to allow it only to lend to solvent institutions, not to the insolvent. The Fed's emergency authority requires it to be "secured to its satisfaction." This language implies room for judgment, but the new statutory language limits the Fed's discretion in applying that judgment. These limits have not yet been tested, but many within the Fed today believe they would at least deter, and perhaps prevent, the Fed in a future crisis from providing some of the most valuable lending facilities of 2008 and 2009, including the commercial paper financing facility (CPFF).¹⁸

The Fed did retain the authority it used in the crisis to lend dollars through the swap facilities to foreign central banks. Also relevant on the international front, the IMF and the WB have (for the present at least) the benefit of the larger funding bases put in place in 2009 and the years after. And the Treasury and the Fed's ability to use the foreign exchange reserves to help deal with a financial crisis in another country also remains in place. This preserves the strange disparity, long true in the United States though not in any other major economy, that the Federal Reserve and the Executive Branch have more tools to help deal with foreign financial crisis that might affect our interests, than they have for a crisis in the United States that threatens the American economy.

Limitations on Guaranty, Capital, and Resolution Authorities

In addition to these limitations on the Federal Reserve's authorities, the United States faces other constraints on its ability to act in crisis.

Congress left in place the expansions to deposit insurance (from \$100,000 to \$250,000) put in place in the fall of 2008, but it took away the FDIC's discretion to guarantee the broader liabilities of banks and bank holding companies. This guarantee authority was critical in the fall of 2008 to limiting the run on the U.S. banking system that accelerated with the failures of Lehman, the Reserve Fund, and Washington Mutual. At that point in the crisis, even the exceptionally aggressive use of the Fed's discount window and other emergency authorities were not sufficient to arrest the run.

The ability to lend against collateral with haircuts designed to protect the central bank against loss is not the economic equivalent of a full guarantee, and creditors behaved accordingly. The fear of default was too great and collateral values too uncertain in the panic for private creditors to continue lending to banks. Maturities shortened, and funds were not rolled over. This happened for secured and unsecured funding markets. And it led to a dramatic intensification of the fire sale dynamics in most asset markets, pushing

¹⁸ See [Labonte \(2016\)](#) for a discussion of the notable changes to the Federal Reserve's Section 13(3) authorities. Some of the most important changes: Section 13(3) assistance must now be broad based, meaning at least five eligible participants meet the eligibility requirements; provision of liquidity can only be to an "identifiable market or sector of the financial system"; assistance requires the approval of the Secretary of Treasury; and, information on borrowers must be provided to relevant congressional committees within seven days.

down the prices of financial assets, and exacerbating concerns about solvency of the entire financial system.

In the fall of 2008 in the United States, the consequence of the haircuts imposed on creditors in the case of Lehman and Washington Mutual was a dramatic escalation in the scope and intensity of the run, ultimately requiring a much more aggressive and explicit use of sovereign guarantees, a much more aggressive fiscal stimulus package, and a much more aggressive monetary policy.

The expanded guarantees amplified the power of the initial capital injections, which were substantial, but not sufficient to fully address the fear of insolvency. Over the course of the fall of 2008 and into early 2009, as we provided more clarity to how we would treat other parts of the bank liability structure, such as limiting losses to subordinated debt, and as we provided more clarity to the conditions that would accompany future public capital injections post the “stress test,” the FDIC guarantees were critical in helping attract private capital back into the U.S. financial system.

Ultimately in the United States we were able to allow and induce a greater restructuring of the financial system and a more aggressive recapitalization of the financial system because we were able to make credible a set of guarantees of the liabilities of the financial system.

The fact that we were able to recapitalize the U.S. financial system with a total amount of public capital that was a fraction of the estimates of more than a trillion dollars prevailing in early 2009 is significantly due to the value of these guarantees. To put it in different terms, by not imposing losses or “haircuts” on non-deposit unsecured and secured claims on banks, by not bailing them in, we helped stabilize the financial system at much lower cost and recapitalized it largely with private, rather than public money.

Congress has also imposed limits on the Treasury’s authority to use the Exchange Stabilization Fund to guarantee money market funds, as it did at a critical moment in the fall of 2008.

The emergency authority used by Treasury to provide capital to the U.S. financial system and purchase other assets expired. This means, as was true before this crisis, the Congress would have to legislate additional authority if it were determined necessary to provide capital directly into private institutions again.

It also means the executive branch does not have the standing authority to enhance the power of the Federal Reserve’s authorities, by taking equity and credit risk, alongside the Fed’s lending, as we did to back stop important funding markets in 2009 through the Term Asset Backed Lending Facility (TALF).

Although these changes imposed limitations on the government’s emergency authority, Congress acted to expand the authorities available to “resolve” large complex financial

institutions, including bank holding companies and certain non-bank financial institutions.

These resolution authorities now extend beyond banks, powers that were only previously available for banks. It was the absence of this authority in 2008 and 2009 that required the messy patchwork of different approaches for “resolving” AIG and preventing the collapse of Citibank and Bank of America.

The FDIC has designed a framework for how to use this authority to help manage a less disorderly failure of an individual major financial institution. The approach is to impose losses on non-deposit creditors up to a level that combined with equity capital would be sufficient to cover a conservative estimate of potential losses, protect the tax payer from losses, and leave the entity with adequate capital and easier to sell quickly.

Resolution Regimes Designed for the Idiosyncratic Rather than the Systemic Shock

This approach, though untested, is a promising approach for the case when an individual firm faces a funding challenge for special, or idiosyncratic, reasons, like an outsized exposure to a single risk factor, a failure of its risk management systems, or massive fraud.

Importantly, however, the new resolution authority is designed to deal with the idiosyncratic shock, not a systemic crisis that could threaten the broader stability of the core of the financial system. And it is likely that this authority if used as designed would exacerbate rather than mitigate the crisis, intensifying the run on both individual institutions and the system as a whole.

Why is this? If as a condition of intervention to allow for orderly resolution or capital injections, you are required to impose losses on a broad class of non-deposit creditors, then you risk exacerbating a run on a broader range of institutions, as investors rationally act to protect themselves against the possibility of haircuts to their claims on other weak institutions.

This risk is low in a strong growing economy where a single institution is vulnerable, for idiosyncratic reasons, like fraud or some other failure to disclose risk. But in a more fragile environment, where there is broader concern about the strength of the financial system, this type of resolution regime risks exacerbating the panic, both in terms of accelerating the run on the weakest institutions as it approaches the cliff and broadening the scope of the run on less vulnerable institutions. If this resolution authority were combined with a standing ability to extend broad guarantees to the core of the financial system then its use would entail less risk of precipitating collapse. But that ability does not exist today. But even if it did, it would be better to build more discretion into the resolution regime itself, so that a failing institution could be unwound more safely with less risk of precipitating runs.

In this sense, a strategy designed to reduce the exposure of the tax payer to losses and to reduce the risk of moral hazard can end up exacerbating both risks. Since few governments will ultimately choose to let the system collapse, a strategy of haircuts in conditions vulnerable to panic can end up costing more money in terms of losses to the tax payer and require the government to socialize more risk.

Post Reform Limitations on the Financial Crisis Tool Kit

Lending Programs	Institution	Peak Value (\$ Billions)	Could we do it today?
Discount Window	Federal Reserve	112	Y
FHLB Advances	FHLB	1,012	Y
TAF	Federal Reserve	493	Y
PDCF	Federal Reserve	148	Y
CPFF	Federal Reserve	351	Y
TSLF	Federal Reserve	236	Y
AMLF	Federal Reserve	152	Y
AIG	Federal Reserve	90	N
Maiden Lane I	Federal Reserve	29	N
Maiden Lane II	Federal Reserve	20	N
Maiden Lane III	Federal Reserve	27	N
Central Bank Swap Lines	Federal Reserve	583	Y
TALF	Federal Reserve Treasury	48	Y

Guarantee Programs	Institution	Peak Exposure (\$ Billions)	Could we do it today?
TAG	FDIC	722	Permanent
FDIC Insurance Increase	FDIC	480	N
AGP	Treasury	419	N
DGP	FDIC	346	N
MMMF Guarantees	Treasury	3,200	N

Capital Programs	Institution	Peak Value (\$ Billions)	Could we do it today?
TARP Capital Investments in Individual Firms	Treasury	315	N
Commitment to GSEs	Treasury	188	N
Agency MBS Program	Treasury	142	N
Public-Private Investment Program	Treasury	19	N

Sources: Federal Reserve, FDIC Quarterly Banking Profiles, Treasury, Yale Program on Financial Stability, Congressional Research Service, FHLB Office of Finance.

This combination of bail out aversion and bail in enthusiasm creates another risk – the risk of inaction. In conditions where the financial system needs capital, and the policy maker is reluctant to inject capital without some burden sharing on private creditors, but recognizes that imposing losses on creditors risks triggering a broader withdrawal of funding, he or she is likely to choose drift and muddle. Torn between bailout aversion, exacerbating the risk of run, or living with consequences of drift, most will chose to try to muddle through. The economic consequences of drift and muddle are prolonged weakness in the capacity of the financial system to provide credit, a greater inefficiency in the allocation of capital, and more burden on other policy instruments, fiscal and monetary policy, to support economic growth.

Implications

These are the post crisis limitations on the emergency authorities in the United States, born of the inevitable popular aversion to bailouts.

Together, these characteristics of the post crisis emergency regime create a heightened vulnerability to a future systemic financial crisis. The combination of a more limited lender of last resort, no standing guarantee or broader capital authority, and a resolution regime designed to prevent the use of public resources and impose losses on current creditors is a dangerous combination. And when considered in the context of the much more constrained power of the monetary policy and fiscal policy tools, this mix of constraints threatens to leave us even less well prepared to deal with future crises than we were in 2007.

The moral hazard and political motivations for limiting future recourse to emergency support for the financial system are understandable, but they are dangerous and misguided.

It is rare for any country to get through a financial crisis without having to do things that, before the crisis, would have been viewed as without precedent or outside the conventional boundaries of appropriateness. You could say this is the definition of a systemic crisis.

I think most policy makers who have faced financial crises would say that ultimately they had to expand the authority available to them, and that the speed with which they were able to do that and the flexibility they gained in doing so was essential to avoiding a worse outcome. If you were always forced to operate within the limits defined pre-crisis, you are more likely to be left with the worst outcomes.

The post crisis limitations on emergency authority in the United States are a reflection of the tragic life cycle of crisis intervention and political reaction.

The cycle tends to work like this. The crisis starts. Policy makers are initially slow to escalate. The crisis intensifies, exceeding the capacity of existing arsenal. Parliaments grant more authority to use fiscal resources. Policy makers use that authority for what

people deride as “bailouts.” The bailouts have unappealing direct beneficiaries, thus proving unpopular, and it’s hard for anyone to appreciate why they are better than the alternative.

The financial “bailouts” have the additional complication that they tend to come well ahead of the trough in economic activity. Asset prices might recover as systemic risk recedes, but the loss of wealth and damage to confidence continues to hurt the real economy. The public outrages intensifies as the economy looks like it’s getting worse despite the bailouts.

The politicians/public blame the policy maker, rescind discretion, and promise never again. The cycle repeats.

The policy maker thus faces the interesting dilemma. If you use the authority you are given, it is likely to be taken away or constrained. If you don’t use it, you will be blamed for not acting with authority you were given.

If you act, you limit pressure on the political system to act, but the political system won’t act until you exhaust your authority.

In the present system, post crisis and post reforms, where the limitations on discretion leave policy makers short of the tools that will be necessary in an extreme crisis, we are choosing to make the elected politicians in the legislature the arbiters of whether to deploy the measures necessary to arrest a panic. This makes it more likely that the emergency response will be late and badly designed, with greater fiscal and economic costs, since runs happen faster than legislatures generally are able to or choose to legislate. Legislatures, like town councils, control overall spending, but they don’t generally try to control how first responders react in the moment. And they generally try to ensure that the fire department has enough trucks and hoses at all times, rather than require it to seek approval to go out and buy trucks when the fire starts.

The reasons offered for this choice, to the extent it is a conscious choice, to operate the financial system with very limited emergency authority is partly that it’s good for incentives and helps reduce moral hazard. But it’s also because limitations on discretion of the executive and the central bank are necessary for democratic accountability and legitimacy.

Both these rationales have merit, but I think there are better ways of solving both problems that don’t leave the country so acutely vulnerable in crisis.

The Moral Hazard Dilemma

On the moral hazard concern, one of the many paradoxes in financial crisis management is that if you do not act swiftly and effectively to break a panic, then you might end up having to socialize more risk and guarantee more liabilities, which of course come with

even greater moral hazard implications. It's hard to solve a moral hazard problem in the midst of the crisis, without dramatically intensifying the crisis.

There are more effective and credible ways of limiting the moral hazard risk in operating with broader standing emergency authority.

A more practical approach involves a mix of things.

Prudential regulation has to bear most of the burden of limiting the moral hazard risk. Supervisors can, if they have the authority, decide how much leverage, how much maturity transformation to permit, and they can, therefore decide how much to force the financial system to self-insure against loss and runs. These approaches can't be realistically calibrated to protect against the 100 year flood, but they can offset much of the adverse effect of the safety net on incentives. The achievements of the post crisis reforms in constraining leverage and limiting funding risk should make us more confident that we could live with the potential risks inherent in a more powerful arsenal of emergency tools.

The emergency arsenal can be designed to help preserve a better mix of incentives and reassurance. Preserving some flexibility and uncertainty about the pace of escalation and perimeter of support in crisis should leave investors and creditors of financial institutions with healthy sense of fear, at least up to the edge of the abyss. Discretion in this sense, can be helpful. In a crisis, it makes sense to escalate slowly and allow a measure of failure and loss, until the risks of collapse are untenable. And at that point, you have to be able to escalate rapidly to break the panic. There are many good arguments for clarity and limits to discretion, but they are not realistic in a crisis, and preserving discretion can help with the incentive problem inherent in a strong backstop.

You can design the interventions to limit moral hazard risk. By providing liquidity and guarantees at a price, below the levels prevailing in a panic, but well above normal conditions, you can limit the risk of prolonged use or abuse. You can limit the perimeter of the funding and guarantees to those inside the perimeter of regulation. You can impose tougher conditions on access to emergency support in the event you have to extend that support to institutions that are "systemic" but outside the scope of prudential supervision. You can impose losses on shareholders as a condition for certain types of exceptional interventions. You can condition access to exceptional guarantees on capital raising or public capital injections that are dilutive to current shareholders. You can condition capital injections on conversion of subordinated debt into equity.

And you can legislate reforms after the crisis to redefine the perimeter of regulation and force the system to operate with more insurance against future risk.

These help limit the moral hazard risk in operating with a strong standing arsenal of Bagehot type emergency authorities. They can't remove the fundamental conflict in a crisis between imperatives of mitigating crisis damage and limiting moral hazard risk, because actions that seem sensible in terms of future incentives tend to exacerbate panics.

The alternative approach of locking the doors of the fire station is dangerous if the limits are credible, and since they are generally not credible, it leaves you with the worst of both worlds.

You can't kill the moral hazard inherent in trying to run a functioning financial system, but you can wound it and limit its force.

Political Checks and Balances

The political arguments for limiting discretion, the ones about legitimacy, are more compelling. Financial rescues entail large potential fiscal costs. There are complicated questions of fairness in determining the allocation of losses and in designing the perimeter of the financial rescue support and its terms. These strengthen the case for more involvement by legislatures in the design of the emergency response. But that involvement should come in the design of the legislative framework that exists ahead of crisis, rather than in the midst of a crisis.

The revealed and perhaps rational preference of the legislator in a crisis is to vote against a rescue as long as possible and until his or her vote is essential for passage. And they generally want to be able to blame someone else for the choices made in the moment of crisis, rather than owning all those choices.

There are many ways to design constraints on discretion that allow room for action that better meets the need for speed and the capacity to adapt in a financial crisis. Monetary policy regimes offer one example of mandated objectives with discretion in how to achieve those objectives. But there are many other examples outside the realm of economic policy.

We should look to those models in designing a better balance than what we have today in the United States.

Typically, democracies have evolved a mix of checks and balances for challenges like these, with supermajorities for decisions by committees, separate approvals (for example, by both the central bank and the finance ministry) for the emergency actions, transparency and disclosure of terms, and ex post assessment and review. One can distinguish what is expected in normal conditions from what might be possible in extremis. The law can define broad objectives and principles for the exercise of discretion.

The regime should allow for the inevitable uncertainty in a crisis, uncertainty about what will work, and the need for flexibility and experimentation. It should recognize that successful crisis management requires allowing the government and central bank to take risks the market will not take and losses the market cannot absorb. It should allow room for early action, before a panic has too much momentum and power. It should establish as a framing objective the stability of the whole system and restoring its capacity to function, not avoiding failures of individual firms. The objective should be least cost

resolution, not in the sense of minimizing the cost of an individual bank resolution, but minimizing the broader costs to the economy that might come from exacerbating a run in the hope of limiting the costs of the first intervention.

The regime we have today in the United States has an awkward asymmetry of discretion across the policy instruments that are essential in a crisis, with more discretion on monetary policy and the limited use of the discount window for liquidity, and less discretion over any dimension of fiscal policy, both the typically Keynesian tools that are almost everywhere left in the hands of legislatures, as well as the emergency financial measures that involve more risk, such as guarantees and capital injections. The consequence of this is more reliance on monetary policy than is desirable. It means that policy makers use fiscal policy later than may be ideal and may be more constrained with the size and composition of the stimulus. It can increase the risk that solvency problems are treated as liquidity problems. It can delay action, encouraging drift, until the only options are even less politically appealing. And it can get in the way of the design of a better mix of protection and pain for the financial system, with more restructuring, and a quicker restoration of an adequately capitalized financial system able to return to the business of providing credit.

We should be able to do better.

To live with the current mix of constraints is dangerous for the United States, and it is dangerous for the world, given the importance of the U.S. financial system and the dollar to the world economy.

The Craft of Financial Crisis Management

A final set of observations on what determines whether we are safer.

As important as the design of the tools and the authority that governs their use, is the state of knowledge on how they should be used.

What have we learned in this terrible crisis about what to do?

How close are we to an accepted consensus on, for example, how fast to escalate emergency support for the financial system? How much risk should the central bank be prepared to take? How broad should the central bank lend in terms of non-banks and more risky collateral? How much failure among financial institutions is desirable? What framework of principles should guide decisions on triage? What's the appropriate line between the role of the central bank and the fiscal authorities? Who should take what risks? What should be the relative burden between fiscal and monetary policy in supporting demand, both in the crisis and in the aftermath as the economy goes through the inevitable prolonged deleveraging?

If you look at the graveyard of financial crises, the variance of choices and outcomes is high, unacceptably high. Given the amount of experience available around the world

among practitioners, and the diversity of mistakes we have all made, we should be able to narrow the variance in execution. Yet we tend to underinvest in this process of learning.

We have no tradition in financial crisis that matches, say the National Transportation Safety Board investigations of airplane crashes. We have no standardized approach to looking at mistakes, like the tradition of morbidity/mortality reviews in surgery and other disciplines in medicine. We have no Army War College to look at how we fought the last wars and to record and spread knowledge about the practice of war.

In the financial stability arena, the cool stuff these days is about prevention, driven by the idealistic, hopeful impulse—that we can eliminate systemic risk, that we can design a system that will allow us to be indifferent to distress in the financial system and never again require recourse to public resources to prevent the collapse of the financial system.

This impulse understandably gets most of the attention in policy. No one wants to be engaged principally in the business of planning for what could go wrong and how to clean up the mess. We neglect the craft of crisis management not just because it is a dirty, loathsome job, but because many fear that in financial policy planning for disaster makes disaster more likely. It is as if, in finance, it is the fire station that causes fires.

We accumulated a lot of valuable experience in our crisis.

This shock was much worse in terms of the loss of wealth and the rise in default risk, for example, than in the early stage of the Great Depression, but our outcomes were much better.

Together, the various elements of the financial rescue resulted in a substantial positive direct financial return, even without trying to estimate the broader economic benefits of the rescue relative to financial collapse or a more extended attempt at drift and forbearance. In effect, the financial system was forced to pay for its own protection.

The emergency protections of funding and capital were removed quickly to avoid the risk of prolonged dependence.

We allowed lots of failure in the financial system. A much larger fraction of the institutions at the center of the U.S. financial system did not emerge from the crisis as independent entities. In comparison to the other major economies, we allowed much more failure and forced more restructuring of the surviving entities.

With the restructuring, we forced a very rapid recapitalization of the financial system, largely relying on private capital.

Our more aggressive initial macroeconomic policy response worked to reinforce the power of the financial rescue, making both more powerful than they would have been on their own.

Policy makers in crisis tend to choose two types of paths: (1) liquidation ending in collapse and partial nationalization or (2) forbearance and drift. We chose a different path with a substantial amount of failure and the rapid recapitalization of the core of the system. And as a result, we suffered much less acute economic and fiscal costs.

Still, the costs were terrible. Economically and politically. The strategy we ultimately adopted in the financial rescue was better than the alternative, and it did what it had to do, but we lost the country doing it.

It could have been better, but only with more discretion granted sooner to the policy maker.

Financial crisis are inevitable. You can reduce their frequency and intensity through more conservative regulation, but you can't limit the damage from the systemic crisis without a powerful version of the arsenal that Bagehot first wrote about. Governments and central banks will perhaps inevitably be late in acting, partly because of the desire to inflict some pain and to allow some adjustment. This means that they are more likely in some cases to fall behind the curve of an evolving panic. This in turn means they will have to act with greater force to prevent systemic collapse. If the capacity to escalate quickly is limited by a requirement for legislation, this will heighten the risk of economic calamity. It would be safer to build in more flexibility in advance.

Conclusion

So, are we safer?

The post crisis reforms have, by any measure, produced a more resilient financial system. Capital buffers are able to absorb a much higher level of losses. The system is less prone to runs, with short-term liabilities of the major financial institutions substantially smaller as a share of the total. This should produce a more stable financial system over some period of time. The resilience of the financial system means that a given dose of monetary and fiscal policy will have more power than if delivered in a less well capitalized financial system.

These achievements, however, need to be considered in the context of the weaker Keynesian policy arsenal and the limitations on the emergency financial authorities.

The underlying stability of the economy is in part a function of the extent of imbalances and the capacity of policy to mitigate the impacts of shocks. The weaker policy arsenal means that future economic shocks will likely cause more damage to the economy and impose greater losses on the financial system. The extent of deleveraging that has occurred in the United States since the crisis should make the economy less fragile. But there are sources of adverse shocks to demand other than the end of a credit boom, and the economy is likely to be less resilient in the face of such a shock because of the limitations on policy.

The new limitations on the emergency authorities make this challenge more acute. The fundamental miscalculation in the reforms was to build a set of authorities designed for the wrong type of crisis, for the idiosyncratic rather than the systemic crisis. By limiting the ability of the central bank and the government to respond to panics and stop runs, they leave the financial system more vulnerable to the most dangerous crisis. And by conditioning resolution authority on the imposition of losses on creditors, the new regime risks intensifying rather than calming an ongoing crisis.

The weaker Keynesian policy arsenal means less capacity to limit the broader economic damage caused by a financial crisis made worse by limitations on the lender of last resort and other authorities.

The perhaps understandable trajectory of regulatory policy in this new world is to further strengthen the shock absorbers in the financial system, raising capital requirements ever higher. If the macro policy arsenal is weaker and the lender of last resort constrained, then aren't higher capital requirements the rational answer?

Capital requirements can bear part of this burden, but history should not make you optimistic about what they can do on their own, without the broader ability to guarantee liabilities, for the central bank to lend freely and to prevent fire sales.

Even much higher capital buffers than we have today post reform were not effective in preventing runs in the U.S. in our golden age of recurring panics around the end of the 19th and the start of the 20th century.

And even much thinner ones than we have today help induce a huge migration of risk away from banks in the U.S. in the decade before the crisis.

Over time, the constraints on leverage will be evaded and end up applying to a smaller share of the financial system, leaving more of the financial system outside the perimeter at risk of runs.

At some point, the financial reforms will have to be revisited and refined. When the opportunity presents itself, it will be important to rebuild more room for discretion in the emergency tool kit, and keep that in reserve, not as a substitute for strong prudential safeguards, but as a complement.

And it's worth making a substantial ongoing investment in the practical knowledge of how to break panics and resolve crises, because we are going to be living for a long time in a world with less room for error and less ability to fall back on the Keynesian arsenal to make up for mistakes in the management of runs and panics.

Given the tragic economic costs of financial crisis, we should want to be more competent in the management of financial crisis, with greater, not fewer degrees of freedom.

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