Crisis and Innovation

ROBERT J. SHILLER

A crisis, such as the financial and economic crisis that we have been experiencing over the last couple of years, can be either an opportunity for important new innovation in our economic and financial institutions and methods, or a time of setback when innovation is delayed, or even reversed. We have to make the former happen. There is still time.

Many world leaders have said recently that the current financial crisis should be considered an opportunity for economic and financial innovation.\textsuperscript{1} Their reasoning seems to be that it is primarily at times of crisis that people are shocked out of their complacency and prodded to change basic institutions and methods. I do not think we have become complacent that the crisis is solved.

Most of us have heard the famous quote “necessity … is the mother of … invention.” It is interesting for our purpose to consider its origin. The quote is from Plato’s \textit{The Republic}, Book II, dating from 360 BC in the dialogue between Socrates and Adeimantus. Surprisingly, it appears that Socrates is talking about the economy (although he calls it the state) and about the fundamental problem of exchange that our economic institutions address:

Socrates: Then, as we have many wants, and many persons are needed to supply them, one takes a helper for one purpose and another for another; and when these partners and helpers are gathered together in one habitation the body of inhabitants is termed a state.

Adeimantus: True.

Socrates: And they exchange with one another, and one gives, and another receives, under the idea that the exchange will be for their good.

Adeimantus: Very true.

Socrates: Then, I said, let us begin and create in idea a state; and yet the true creator is necessity, who is the mother of our invention.

This passage certainly reminds us how long this job of reinventing the economic system has occupied thoughtful people! Before I found the preceding passage, I thought the quote did not make sense. For, as documented eloquently by historian of technology Jacob Schmookler [1966], most invention is the result of a continuous creative process, driven by scientific curiosity, tinkering, and the perpetual impetus to improve, not by immediate necessity. But when we are talking about invention as the \textit{application} of a basic theory, then the role of necessity, or crisis, becomes clearer. This is especially true in terms of our national economic or political institutions, as suggested by
bailouts and their ensuing tax burden as well as on anger among the public, an anger that is focused on the people are losing their jobs and their houses has led to tackle of large corporate bailouts and high executive salaries signs of working against financial innovation. The spec-

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crisis situation in the Commonwealth of Massachusetts as a result of financing a war amidst a massive inflation. As I discovered in my research, the innovation was a measure of desperation, resulting from the inability of the government to borrow during a crisis and was derived from financing pressures facing the Dutch government during a difficult phase of the Eighty Years’ War between the Netherlands and Spain from 1568 to 1648 (Neal [2005]).

The invention of the inflation-indexed bond, as well as the consumer price index that such bonds rely on, occurred in 1780 in the U.S. and was a response to the crisis situation in the Commonwealth of Massachusetts as a result of financing a war amidst a massive inflation. As I discovered in my research, the innovation was a measure of desperation, resulting from the inability of the government to borrow during a crisis and was derived from financing pressures facing the Dutch government during a difficult phase of the Eighty Years’ War between the Netherlands and Spain from 1568 to 1648 (Neal [2005]).

The New York Stock Exchange, with its rule-

making functions, was founded in May 1792. The founding of the NYSE came just a few years after the crisis of the Revolutionary War was resolved, which had already spurred Hamilton’s Federalist financial revolution, and just two months after the crisis of the first U.S. stock market crash (Sylla [2005]).

But, unfortunately, crisis can work against innovation. Public hostility toward business can result in an atmosphere of arbitrary regulation. Since 2007, the world financial crisis has spawned some populist anger that shows signs of working against financial innovation. The spectacle of large corporate bailouts and high executive salaries in the bailed-out companies at the same time common people are losing their jobs and their houses has led to anger among the public, an anger that is focused on the bailouts and their ensuing tax burden as well as on executive compensation. This anger threatens to derail financial innovation.

There is a strong sense of injustice today that is spurred by the economic crisis, and this sense of injustice threatens to hamper not only further economic and financial innovation, but even the stability of the economic system we already have. A sense of injustice can make it impossible to proceed.

In my and George Akerlof’s recent book Animal Spirits, we argue that the sense of anger about bad faith in business dealings is part of the process that creates a severe economic crisis because it interferes with forward-moving economic measures. The severity of the Great Depression was, in part, due to public anger. At such times, public pressure for punitive regulation can lead to the stifling of innovation.

Fortunately, in much of the world today, the sense of injustice has not produced any major political movements to interfere with the functioning of business. Only two governments have fallen due to the financial crisis, and these were only very small countries (Iceland and Latvia). Public support for free-market economics is still strong. It is important then to proceed in such a way that the flames of the public’s anger are not further fanned. Financial innovation at this stage of history requires that we bend over backward to ensure that the general population is fairly and justly treated.

This means that we should particularly focus on promoting innovations that democratize finance, that make it work better for the people, for the poor as well as the rich. The New Deal period of the 1930s was a time of exceptionally rapid financial innovation. The Roosevelt administration had the public’s support to facilitate innovation because many of these innovations were clearly extending financial protections to everyone. Deposit insurance was clearly defined as a benefit to most people because it only insured small deposits. Similarly, mortgage market innovations, such as the encouragement of the long-term self-amortizing mortgage, and later the Investment Company Act of 1940, also were easily understood as being designed to help the majority of the public.

Note that the innovative spirit spurred by a crisis is not short-lived. Although these events occurred within a few years of the crisis of the Great Depression, they led to a sequence of allied innovations and improvements. Because people remain worried and concerned about the financial crisis we are in today, we need not regard the
time for innovation associated with the present crisis to have already passed.

It is important to consider the insight from economic and financial theory. Unfortunately, the process of innovation seems to be held up by a tendency for amateur inventors, who rely on no economic theory, to get undue attention. Congressmen are writing new legislation with sometimes inadequate input from economic theory.

Financial theory is of fundamental importance to the crisis because it provides a framework for thinking about how we can really improve human welfare. A landmark paper by Backus, Kydland, and Kehoe [1992] showed just how far financial risk management had yet to go. Backus, Kydland, and Kehoe measured the success of financial risk management by comparing the correlation of consumption across the nations of the world with the correlation of their national incomes. In an ideal, perfectly hedged economy, the volatility of consumption should be reduced to that amount caused by global risks alone, because all idiosyncratic risks should be hedged away. They found that the correlation of incomes was in fact higher than the correlation of consumptions. The neoclassical theory of risk management has produced this insight as well as a suggestion of how we can proceed to fix the problem, but fixing the problem still requires invention, and the implementation of that invention.

Another emerging branch of financial theory is the realm of behavioral finance. For the past 20 years or so, this field has emerged as a powerful structure. It is not the antithesis of neoclassical finance (Ross [2004]), but is instead its best chance for application, as it asserts the reality of human limitations and anomalies that must be understood, just as a physicist must have an understanding of friction before he can apply the Newtonian theory of friction.

STAGES IN RESPONSE TO A CRISIS

At this point, much of the discussion of the crisis has focused on policy to promote a healing process. But the term “healing process” suggests a human-body metaphor, implying that the best we can hope for is to return to the way we were. The economy is not a biological organism, however. The economy is really an invention, or the accumulation of many inventions, that needs fundamental reexamination. Instead of a healing process, we should think in terms of an “invention process,” a process that should occupy us for years to come.

It may be helpful to use a different metaphor. Imagine that we have the task of responding to a string of accidents on a congested system of highways that has just grabbed the nation’s attention. A historic pileup of cars has occurred, each car striking the other in a chain reaction, and resulting in a shocking loss of life. The situation sounds analogous to the current financial crisis that is related to another sort of chain reaction in which one failure of a financial institution leads to another and to a chain reaction of failures.

The public response to such a highway pileup might take place in several stages. The first response might be to shut down free access to the highways so that only government-approved vehicles could use the highways. This action would compromise the complete functioning of the system, but at least would make sure that another major pileup would not immediately occur. From a longer-term perspective, however, this would be an unsatisfactory response.

The second-stage response might be to reopen the highways and to hire more and tougher traffic policemen who would give people tickets if they exhibited reckless behavior. But that would not be the end of the response. A third stage would be to work toward a public consensus to build wider highways to reduce congestion, to overcome the obstacles that would be associated with such a major construction project, and to arrange the funding for the project. Someone might even invent and install sophisticated sensor devices on cars to detect risks of pileups and create a systemic, computerized response. This stage would take a long time to complete and involve a lot of planning and invention.

And a fourth stage of response might be to take the seemingly unnecessary step (at least in terms of the original crisis) of using eminent domain to acquire the rights of way to build more highways to more places to improve the functioning of the whole system. This endeavor would relieve the congestion of the highway system by allowing people to take more direct routes to their destinations, and even generate new route possibilities by creating altogether new destinations. A fourth stage emerges when we think about the accident in a broad sense, when we have time to reflect on the ultimate purpose of a highway system. By improving the real function and scope of the highway system, the accident problem is relieved and the tradeoffs that people face are reduced, tradeoffs that involve the risk of accidents. The complete reaction process to a major pileup on a highway might take a decade or more to run its course.
I think we can consider that, just over two years into this financial crisis, we have passed through the first stage of response and we now are intent upon the second stage and have just begun the planning for the third stage.

An example of part of the third-stage response is the set of contingent-capital proposals that have been put forth, which would act to automatically increase the capital stock of banks in times of systemic financial crisis. The introduction of contingent-capital mechanisms would be a serious change in the structure of our financial system, similar to how computerized highway systems could prevent the pileups of cars. Versions of this type of proposal have been offered by Raviv [2004], Flannery [2005], Kashyap, Rajan, and Stein [2008], and Caballero and Kurlat [2009], as well as by the Squam Lake Working Group.2

The Squam Lake Working Group version, called regulatory hybrid securities, would work as follows. The government would offer incentives to banks to issue these securities during normal times in place of conventional bonds. The securities would function as normal bonds except in the unusual circumstance of the occurrence of two independent triggers that would convert the bonds to equity. The first trigger is when government regulators announce that the nation is in a systemic banking crisis. The second trigger is when the individual bank violates the capital requirement covenants in the security’s contract. The securities convert only if both triggers apply.

The proposed securities solve an essential problem raised by a banking crisis, that is, troubled banks are reluctant to issue shares to meet capital standards because the new capital tends to be very dilutive to existing shareholders and to be unduly beneficial to bondholders. Financial theory has identified and described this as a debt-overhang problem. When this type of problem occurs, banks start calling in outstanding loans and stop issuing new loans, putting the economy into a tailspin. In the current crisis, the government was unprepared for this problem and felt compelled to bail out many banks. But, if banks had issued the regulatory hybrid securities before the crisis, the supply of new capital would have been automatic and would not have involved taxpayers.

The references to financial theory that underlie this proposal clarify why the government needs to get involved with encouraging these securities. Banks will not issue them on their own because they would rather rely on a government bailout, one that they will come to expect after this crisis. Encouraging banks to issue these securities is thus a public good and a legitimate role for the government in terms of economic theory.

To this list of third-stage proposals I would add other proposals that offer a great benefit in terms of the democratization of finance. Until now, a defect of much of the innovation that has occurred is that it seems primarily focused on banks and large financial institutions. Efforts to help individual homeowners have been mostly ineffective.

A third-stage proposal that I made in my book Subprime Solution is a continuous workout mortgage, a new form of mortgage that provides a workout for the homeowner by reducing the mortgage principal should home prices fall in the homeowner’s city or in the case of an economic crisis. The mortgage is specified in the mortgage contract and involves no moral hazard because the workout depends on an aggregate, not an individual value or income. The workout, moreover, would be continuous, systematic, and automatic, and eliminate all the uncertainty and emotional distress that the current type of workout entails. We probably need the government to encourage the adoption in the private sector of a continuous workout mortgage, just as the government in 1933 encouraged the adoption of the long-term, self-amortizing mortgage, which is still with us today.

I also made fourth-stage proposals in Subprime Solution as well as in earlier books, and I have been trying to implement them. In many ways, this financial crisis is the result of our inability to properly manage real estate risk. Because no liquid international markets for real estate risk exist, those who are faced with massive risks of this nature have only been able to deal with them by circuitous and unsatisfactory routes, such as credit default swaps with their attendant counterparty risk.

I have worked, along with my colleagues Sam Masucci and Allan Weiss through our company Macro-markets LLC, with the Chicago Mercantile Exchange and Standard & Poor’s to create futures and options markets for single-family homes, based on the S&P/Case-Shiller® Home Price Indices. The CME launched these markets for 10 U.S. cities and created the 10-city aggregate in May 2006, but we have never been able to gain sufficient liquidity in these markets. All are still listed at the CME, but their trading volumes are very low. No one wants to trade because literally no one else is trading, a vicious circle that we have not yet been able to break.

In an attempt to create a broader and more liquid market, we decided to list the 10-city aggregate index on
the New York Stock Exchange, listing only one index in order to concentrate the liquidity. We launched a pair of securities, MacroShares, a long security with ticker symbol UMM (Up Major Metro) and a short security with ticker symbol DMM (Down Major Metro). Unfortunately, these securities did not succeed for the same reason as the broader set of indices on the CME, and we shut them down in January 2010.

We were trying to set up, in effect, a whole new highway system on a shoestring budget, and with no government help. It is a shame that such efforts have not yet been successful because these types of markets would facilitate new products, such as a continuous workout mortgage. We will keep trying. We are undeterred by failure. Failure may mean only that we did not adequately design all details of our invention. We will change the details.

The next major step might best be taken by the government, which has a better chance of establishing new standards and procedures on a national basis. I have been arguing for years that governments of advanced countries should issue a new kind of national debt. Now would be an especially appropriate time to advance this initiative given the concern about pressures on the financial and economic system as the national debt grows and grows.

Mark Kamstra and I have proposed what we call a trill. The idea is very simple, plain vanilla. National governments would sell shares in their GDP. A trill would pay, each quarter in perpetuity (or until the government buys it back at market price), a dividend equal to one trillionth of the respective nation’s current year GDP. The price of the trill would be determined by the market. Mark and I believe that in the present environment the market might price the trill very high relative to the current dividend, given the growth rates we have seen in GDP and the reasonable expectation that these will continue in the future. Governments might be impressed both by the high price of such securities (at a time when the price of conventional Treasury debt is declining) and by the opportunities that they provide for risk management.

Trills would bring into play a new dimension of international risk management. They would directly address the risk anomaly identified by Backus, Kydland, and Kehoe [1992] and, if traded internationally, they would allow international diversification of national income risks. The price discovery that trills markets would reveal could increase international awareness of some major economic inefficiencies. For example, if a developing country issued its own trill, the nation might be startled out of complacency by the high price that was set on the security. The price might be much higher relative to dividends or earnings than the price of a security issued by a private company in the developing country because the moral hazard problems associated with the trill may be less severe. This type of price discovery might then encourage a better intertemporal optimization for those countries, relieving the nation’s poor of the burden of saving today for future economic growth and allowing them to lift themselves out of poverty decades earlier than otherwise would have been the case.

MOVING TO THE NEXT STAGE

Financial innovation has many benefits as I have described in this article, and such benefits are typically associated with the kind of financial innovation that the current financial crisis might spawn, if we respond appropriately. We need to recognize the importance of the later stages of financial innovation that might follow the recent financial crisis. If we accept that we have a mission that involves invention, that we must experiment with many new ideas, and that we have to look at financial theory as a basis for developing new financial devices, then we can expect to see significant advances that will leave us better off than we were before the recent crisis. Such advances are inherently difficult to achieve, but great strides can be made when public attention is focused on a problem, as often happens after a major crisis. Necessity may be the mother of invention, but only if we take the necessary action to see it through.

ENDNOTES

This article is based on the author’s address to the American Economic Association/American Finance Association Joint Luncheon, Allied Social Sciences Association Meetings, in Atlanta GA, on January 3, 2010.

1These leaders include our own President Barack Obama and Treasury Secretary Timothy Geithner as well as the former Treasury Secretary Henry Paulson under President George W. Bush.

2The Squam Lake Working Group is a non-affiliated group of academic financial specialists that first met at Squam Lake, New Hampshire, in November 2008. I am a member of this group of academic economists. The group’s proposal for contingent capital was not my idea.
REFERENCES


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