The Credit Crisis of 2007–08: What Have We Learned?

If a financier woke up today from a 20-year nap, the current financial system would be virtually unrecognizable. The new system, with its highly leveraged securitization and far-reaching derivatives, bears little resemblance to the financial system of the past, when the relationship between lenders and borrowers was close—and, likewise, borrowers’ creditworthiness mattered to lenders. Burton Malkiel, Chemical Bank Chairman’s Professor of Economics at Princeton University, explains that the new system of finance changed risk completely for bankers, who no longer collected on the mortgage loans they made but, rather, sold them to investment bankers, who packaged them into mortgage-backed securities. This transfer of risk led bankers to make worse and worse loans to people with less and less credit. The fact that many borrowers had no equity at all didn’t matter, they reasoned, because home prices would rise and the equity would come—and in any case the original lenders held the risk for only as long as it took to sell the loan. Home prices did rise dramatically for most of the last decade (although, Malkiel argues, largely as a result of the new financing). But when home prices faltered, the new system was so leveraged that it fell apart in a rapid downward spiral. Malkiel explains what happened and discusses the implications of the credit crisis for the economy and higher education.

The New System of Finance

Banks played a central role in the old system of finance: they would make mortgage and other loans to individuals, and loans to businesses, and hold onto those loans as assets on their balance sheets. The loans were largely financed by the deposits the banks brought in. Because the banks held onto the loans, they had every incentive to carefully review loan applications and to monitor and collect the loans. This is the old “originate and hold” model of financing. In contrast, I call the new system the “originate and distribute” model. In this model, banks loaned far more than they had in deposits, raising the additional money by selling their loans to investment banks, which packaged them into mortgage-backed securities and sold them again.

The investment banks weren’t simply selling one large security that represented all those mortgages. Instead, they created a new alchemy primed by financial engineering. The mortgage-backed securities, for example, were diced up into several tranches, each with different bond ratings. Derivative securities of all sorts were developed. Derivatives take on value based on some underlying security: in the case of mortgage-backed securities, the underlying security is the mortgages themselves; for stock options, another derivative, the underlying security is the stock in question.
Another derivative, the credit default swap (CDS) market, was also developed. Briefly, this swap market allowed two parties—called counterparties—to bet for or against the performance of companies. For example, if I owned General Motors (GM) bonds and I was worried about the automobile industry, I could buy insurance—from someone who was optimistic about GM—that would pay me if GM were to default. The problems with this market lay in the fact that anyone could buy the insurance, even if he or she didn’t own the underlying bonds. So eventually the credit default swaps trading in the market grew to as much as 10 times the value of the underlying stocks or bonds. And one company (AIG) got itself way overextended by selling these CDS instruments. This change, where the derivative markets grew to a large multiple of the underlying markets, is the crucial distinction between the old and the new finance systems. It happened, too, in the mortgage-backed securities market and—because such securities derive value only from their underlying security—the leverage became enormous.

Moreover, the financiers created structured investment vehicles, or SIVs, that kept the derivative securities off their books and where the banking regulators couldn’t see them. The mortgage-backed security SIV would borrow the money needed to continue the process, and all that showed up on the investment bank’s balance sheet was a small investment in the equity of the SIV. In the past, banking regulators would have flagged the vast leverage and the risk it carried, but that didn’t happen in the new finance system.

**Housing—The New Alchemy**

In the new finance system, banks assumed the risk of mortgage loans they originated only as long as it took to sell them in the mortgage-backed securities market—what the bankers called “pipeline” risk. Given this fundamental change in risk, banks began to make worse and worse loans, including the infamous NINJA loans—home loans to individuals with No Income, No Job or Assets. These subprime loans were packaged for investment bankers to sell as mortgage-backed securities.

Table 1 illustrates what I call the new alchemy of finance—in this case, how these packages of subprime loans were transformed into investment-grade portfolios.

Tranching allows the investment bank to market different parts of products to investor groups with different risk appetites. In this example, the mortgage-backed securities have been diced up into eight tranches: the first tranche, representing 80 percent of the value of the mortgages, offers a relatively low interest rate but is the safest and will get paid first. If, for example, 10 percent of the mortgages default, the first tranche will be paid completely. The investment banker pitches that to the rating agency, which based on the fact that the historical mortgage delinquency rate in the United States has generally been around 4 percent, gives the investment a AAA rating. Indeed, based on this logic, a full 95 percent of these bad loans—all the loans in the top six tranches—are rated investment grade (BBB – or better). The lowest, most junior tranche—often referred to as the “equity” or, more tellingly, the “toxic waste” tranche—was to be paid only after all the other tranches had been paid. Finally, note that because investment banks and hedge funds were among the most active buyers of structured products, a large part of the credit risk never actually left the banking system.

These overly optimistic forecasts about structured mortgage products were deeply flawed for two key reasons: (1) they were based on historically low mortgage default and delinquency rates, which arose in a credit environment with tighter credit standards; and (2) past data suggested that housing downturns were primarily regional phenomena—that is, the United States had never experienced a nationwide housing slowdown since the Great Depression. This seemingly low correlation of house prices across regions led to a perceived diversification benefit that boosted the evaluations of the securities in the AAA-rated tranches in particular.

Figure 1 shows housing prices in the United States adjusted for inflation since 1890. Notice that in the late 1890s, the inflation-adjusted price for housing was essentially the same as it was in the late 1990s. The only reason the trend line goes up at all is because of what has occurred since 2000, otherwise, the trend line would be quite flat overall. But between 2000 and 2007, the inflation-adjusted price of housing nearly doubled. That is the housing bubble. I believe the bubble resulted directly from the new system of finance, in which securitization allowed almost anyone to become a mortgage broker and led to an erosion of lending standards, low mortgage rates, and excesses in lending. All this fed a housing frenzy, during which subprime mortgages came to account for nearly 15 percent of all U.S. mortgages.

Figure 2 illustrates the housing bust and speaks for itself. The latest data show that by mid-2008 housing prices had fallen...
more than 15 percent over the previous year. The precipitous drop in home equity set off an increase in delinquencies in subprime mortgages, which triggered a full-blown liquidity crisis.

**The Shadow Banking System**

How could defaults in subprime mortgages have triggered a credit crisis of such magnitude? Essentially, the new system of finance allowed the development of a shadow banking system in which the small commercial banks of the old system were just one of the players in the credit creation process. Investment banks, hedge funds, and large commercial banks all began to securitize mortgage loans (and business loans as well) and trade them—so much so that, as mentioned above, the derivatives market was as much as 10 times larger than the actual securities underlying it. Further, most of the buying of these bad loans was done with borrowed money, and thus the leverage and its concomitant risk were massive. And structures such as SIVs kept it all off the books and out of the reach of regulators.

This shadow banking system congratulated itself for enabling low-income people to buy their own homes and placed great faith in the strength of the U.S. housing market. This faith led these bankers to a value at risk proposition based on a normal-shaped bell curve; that is, they assumed that 95 percent of the distribution of the mortgage loans fell within two standard deviations of the mean. Since only the bottom tail is problematic, the bankers and rating agencies figured that their value at risk was just 2.5 percent of the time. In other words, a mortgage default would be a rare event, and they didn’t think that rare events would happen to them. But the mortgage loans made in the shadow banking system were fundamentally different from those in the old system, upon which the normal bell-shaped curve analysis was based.

Again, borrowed money fueled the derivatives markets. A crucial, complicating factor was that the mortgage-backed securities were long-term assets—the mortgages, after all, were written for 15, 20 and even 30 years—but their purchase was financed with short-term debt. This meant that the traders had to continually refinance, or roll over, their debt to keep the system going. Bear Stearns, for example, relied on rolling over much of its balance sheet day by day and likewise was wholly dependent on funding liquidity. (And Bear Stearns was not alone in this regard.) Because of their overly optimistic value at risk assessments, the traders’ equity—that is, their own capital—in the securities was thin. When housing prices dropped, the short-term lenders got nervous and asked for more equity, or margin, from the traders. Given the mismatch in the maturity dates of their assets (the mortgages) and their funding (using short-term debt), as well as their highly leveraged positions, the traders had to sell their mortgage-backed securities for equity to raise their margins. The sell-offs dropped the market price, which made the short-term lenders ask for more margin, which led to more selling, which increased the demand...
for margin, all of which fed a rapid downward spiral of deleveraging. The fragile system, built on counterparty agreements, came apart when the willingness to extend credit evaporated during the downward spiral.

Implications for the Economy and Higher Education

Detailed analysis of the effects of the credit crisis on the financial markets and the U.S. economy is beyond the scope of this summary. Suffice it to say that the deleveraging process will be painful for the financial sector, whose profitability is plummeting. (Indeed, since the Forum’s 2008 symposium, we have seen Lehman Brothers declare bankruptcy; Goldman Sachs and Morgan Stanley completely restructure themselves, and a massive federal financial rescue.) The ability of businesses to borrow money is decreasing, as is the availability of money to finance private equity takeovers. Housing prices have farther to fall, and individuals can no longer use equity in their homes as sources of cash. Consumer credit continues to tighten, making it more difficult to borrow for cars, college, and a wide variety of consumption goods. Thus, as the leveraged shadow finance system falters, so too has the fertilizer that stimulates consumption and gross domestic product.

The higher education sector is feeling the effects of the credit crisis in a number of ways. First, the financial stress on families is limiting how much they can afford to spend on college, particularly as their ability to tap their home equity for tuition payments decreases. Meanwhile, the private student loan market—dependent on the flow of credit—has virtually collapsed, closing the door on that financing option for families. The federal government needs to make more students loans available, but progress on that front has been slow. In terms of development, the vast destruction of wealth in the financial sector undoubtedly will limit how much some of the historically most wealthy alumni are able to give to their institutions.

The implications for endowment returns are also negative as the value of endowments has fallen along with the decline of market prices around the world. But because endowments are meant to preserve equity in perpetuity, universities can accept illiquidity in their investments—unlike individuals who plan to use their savings eventually for, say, retirement, or corporations that will need to fund pensions. While the market for derivative securities has been highly illiquid, not all of those loans will default; endowment managers can take advantage of the collapse in prices and even work with hedge funds to take advantage of the real opportunities out there for those who can accept illiquidity. That said, the staff and acumen needed to navigate these waters should not be underestimated. Small institutions are at a disadvantage in terms of being able to sort the good investments from the bad. Thus, it will be increasingly important for smaller institutions to work together in consortia to make the most of the investment opportunities in the fallout from the credit crisis. Commonfund, which invests more than $30 billion for nonprofits such as hospitals, museums, and colleges and universities, is an example of how small institutions can profit by working together.

Conclusion

Uncertainty abounds in today’s financial markets and exacerbates their volatility. Much of the uncertainty can be attributed to the difficulty of valuing SIVs and derivative securities, largely because so little historical data are available to inform valuation and assign probabilities. The good news is that risk spreads—that is, the difference between the yield from U.S. Treasury bonds and high-risk (aka junk) bonds—have expanded from a very low 2 percent in mid-2007 to a near-historic high spread of more than 10 percent today. This means that the risk associated with these new instruments is being recognized, which may strengthen the market for them and likewise ease the credit crunch somewhat.

That said, the spillover effects of the turmoil in the financial sector to other markets not directly linked to subprime mortgages are proving to be large and painful. Clearly, it is difficult to say how the credit crisis will ultimately play out. There is no doubt, however, that our current regulatory framework has failed and that going forward it must be managed so as to reflect and maintain pace with financial innovation.

We appear to be in a serious economic slowdown,1 and the adjustment period is likely to be prolonged. I am convinced, however, that the flexibility of the U.S. economy and American innovativeness will help mitigate the spillover effects of the credit crisis and that in the long run no one will get rich betting against the U.S. economy.

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Note: This summary reflects work by Markus Brunnermeier. The reader is advised to refer to his paper on the credit crunch at: www.princeton.edu/~markus/research/papers/liquidity_credit_crunch.pdf.

1 Note that this presentation was given in June 2008; in December 2008, NBER determined that the U.S. economy was in recession.