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INVITED EDITORIAL COMMENT

What We Still Have to Learn from the Credit Collapse (and Other Market Crises)

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Lehman Brothers filed for bankruptcy on September 15, 2008, a clear signal of the deep-rooted problems that would set off a major credit crisis. Mortgage-backed securities were at the epicenter of the crisis, brought about by an explosive cocktail of heavily leveraged, subprime mortgage products. Although the high-risk mortgage securities have largely been purged from the system, their underlying combustible characteristics, including the promise of higher returns for less risk, opacity and complexity, leverage, and potential for sharp swings in value, have brought about similar crises in the past and are likely to reemerge in some form in the future.

U.S. housing prices began their upward climb in 1997. The economy benefited as homeowners, borrowing against the rising prices, increased consumer spending. At some point, however, the housing boom became a bubble. By 2001, the rate of price increases for expensive homes began to be overtaken by the rate of price increases for the least expensive homes. A marked increase in subprime lending was behind this and allowed the bubble to continue to inflate until mid-2006.

Risky subprime loans would not have been made on such a large scale in the absence of structured securitization. Independent mortgage brokers provided mortgage loans and sold them for securitization, Wall Street's commercial and investment banks created mortgage-backed securities, and insurance companies and hedge funds sold protection from default for buyers of mortgage securities.

With structured securitization, mortgage lenders diversify their individual risks by pooling mortgage loans and slice and dice the principal and interest rate payments into tranches offering risk–return trade-offs that appeal to a range of investor risk appetites. The magic of tranching transforms most of the pool into AAA rated debt cushioned by subordinate tranches that are expected to absorb any losses from defaults on the mortgages in the pool.

Subprime securitization seemed to offer benefits for all: borrowers, lenders, and investors. Investors could buy AAA rated tranches apparently comparable in risk to U.S. government securities while enjoying higher yields paid by subprime borrowers. At the same time, securitization allowed lenders to offer mortgage borrowers lower rates than they would have had to offer in the absence of securitization. The lower rates reflected the numerous benefits that securitization offered to lenders. Securitization appeared to transform illiquid investments into more liquid assets that could be sold, often at a profit, providing more funds for investment. It passed the risk of default by mortgage borrowers from lenders to the buyers of the securities and, in turn, to the sellers of default protection.

Securitization allowed commercial banks to move mortgage assets off their balance sheets, reduce leverage

ratios, free up capital for more investment, and, potentially, earn a greater return on equity. It provided investment banks with highly rated mortgage securities they could use as collateral for borrowing in the repo market or for commercial paper issuance.

Mortgage-backed products seemed to offer a free lunch—increased return at reduced risk. Free-lunch products hold obvious appeal for investors and are often able to attract substantial interest. They may even grow large enough to affect the markets in which they trade, amplifying price movements.

This was true of portfolio insurance in the 1980s. Portfolio insurance was marketed as a means of controlling risk and increasing returns, which was accomplished by shifting portfolio assets between stock and cash in accordance with the option pricing model. As stock prices rose, programs purchased more stock; as stock prices fell, programs sold stock. Essentially, portfolio insurance operated as a synthetic protective put option, with the risk of stock market declines shifted from insured investors to other, uninsured investors. With about $100 billion in assets under management, portfolio insurance helped to support the stock market's rise in the mid-1980s, just as subprime mortgage-backed securities helped to expand and enlarge the housing bubble in the 2000s.[1]

Portfolio insurance was supposed to immunize user portfolios against the risk of declines in the equity market. Structured securitization was supposed to immunize holders of AAA rated tranches of subprime mortgage securities against the risk of default by mortgage borrowers. However, the risk of a broad stock market decline is a systematic risk; similarly, the risk of mortgage defaults can become systematic if enough borrowers default.

Systematic risk cannot be diversified away. Controlling systematic risk relies on being able to shift the risk from those who do not want it to those who will accept it in exchange for a return premium; however, as more investments pour into products designed to reduce risk while increasing returns, the level of risk that must be shifted increases. The availability of counterparties diminishes. Liquidity begins to dry up.[2]

In 2006, house prices in the United States started to decline. Defaults, especially on subprime loans, increased more quickly and more than expected; by 2007, many subprime loans were defaulting within a year or two of issuance. As the risk of default underlying AAA rated mortgage products became apparent, investors' willingness to assume that risk evaporated, just as in 1987, when investors' willingness to take the other side of portfolio insurance trades dried up. In 1987, the result was a market crash on October 19. In 2008, the result was a housing market crash, which nearly brought down all of Wall Street, along with the global economy.

The rise and fall of mortgage products were abetted by their opacity and complexity, which made it difficult to discern the true risk of the underlying mortgages. Tranching transformed innately risky subprime loans into AAA rated residential mortgage-backed securities (RMBS) and transformed BBB rated tranches of RMBS into AAA rated collateralized debt obligation (CDO) tranches. Furthermore, sellers of credit default swaps insured against defaults. The incorporation of AAA rated tranches into asset-backed commercial paper (ABCP) conduits resulted in seemingly the safest product of all because the short-term commercial paper issued by these entities, purchased primarily by money market funds, was perceived as being impervious to default risk and as being highly liquid.

The real risk, however, ultimately depended on the ability of mortgage borrowers to make their monthly payments; in many cases, these were borrowers with poor or nonexistent credit who had made small or even no down payments. Somehow, this reality was lost in the complex chain of securitization from mortgage borrower to mortgage lender, to RMBS securitization, to CDO packager, to ABCP conduits, and to other buyers.

Homeowners collectively held a massive put option on the housing market. Mortgage borrowers have an implicit long put position: They may default if their property's value declines below the principal owed on the loan. Mortgage lenders are short the put and hence absorb the loss if homeowners exercise their puts. In the years leading up to the crisis, however, lenders had transferred their short put positions (i.e., shifted the risk) to the buyers of mortgage-backed securities.

With options, relatively small changes in the price of the underlying asset can lead to large, nonlinear

[1] See Jacobs (1998, 1999a, 2009, 2018).
[2] See Jacobs (2004).

changes in the value of the option. The stock market's decline in the fall of 1987 called for portfolio insurers to liquidate most or all of their stock portfolios. The values of stocks plunged. As house price declines beginning in 2006 made homeowners' put options more valuable, many defaulted on their mortgages, exercising their puts. The values of mortgage securities plunged.

Securitization encouraged the piling on of leverage, compounding the problem. Securities based largely on prospective interest and principal payments from shaky borrowers were used in turn as collateral for further borrowing. Leverage helped to expand the market for mortgage-backed products, thus amplifying the housing boom. However, deleveraging can, like an option, induce nonlinear effects. Leverage provides a trigger that can act like an option strike price and force borrowers to unwind positions, often at unpropitious times and at losses.

Although leverage was not the predominant factor in the 1980s, portfolio insurance programs did engage in margined futures trading, which accelerated the adoption of the strategy because the futures market was thought to be a separate haven of liquidity. The increase in insured portfolios in turn magnified its effects on both the stock and futures markets.

Leverage was a notable aspect of the disruptions in several markets caused by the near-collapse of the giant hedge fund Long-Term Capital Management (LTCM) in 1998.[3] LTCM had engaged in numerous complex arbitrage strategies. Its use of derivatives and offsetting long and short positions was supposed to have immunized these strategies against changes in equity markets, interest rates, and currencies. The presumed low risk of its positions allowed LTCM to apply high levels of leverage to boost returns. In 1998, however, Russia's default on its bonds set off a global flight to safety, which decimated LTCM's positions. Facing margin calls from its lenders and counterparties, LTCM had to raise capital or unwind positions. This led to forced selling of its risky long positions in declining markets and covering of its low-risk short positions as their prices rose.

In the credit crisis, the riskiness of mortgage-backed securities based on subprime loans became apparent when defaults rose above expected levels. Lenders that held mortgage securities as collateral called in their loans or demanded payments to compensate for the added risk. Borrowers were forced to sell assets into a falling market, exacerbating losses.[4] As the growth in subprime mortgage lending had helped to fuel the housing bubble, the collapse in value of mortgage-backed securities helped to deflate it.

Leverage magnifies feedback, which can lead to downward spirals. The decline in banks' willingness to lend led to a decline in economic activity. This caused further declines in house prices, more defaults, further deterioration in value for mortgage-backed securities, and further tightening of the credit market.

The U.S. economy contracted at a sharp annual inflation-adjusted rate of 8.2% in the fourth quarter of 2008, corporate profits experienced their sharpest decline since 1953, and consumer spending fell at a record rate. In February 2009, the unemployment rate hit its highest level since 1983. The Dow Jones Industrial Average fell to a 12-year low of 6,547 in early March 2009, about 54% below its October 2007 peak. June 2009 marked the trough of the business cycle downturn that had begun in December 2007 and hence the official end of the Great Recession.

Today, 10 years after the Lehman bankruptcy and after a dramatic government rescue of financial institutions and the introduction of various reforms, the U.S. economy continues on an upswing. But the landscape has changed. Some $15 trillion in U.S. wealth disappeared during the crisis and its immediate aftermath, and some 9 million individuals fell into poverty. It took until 2013 for the stock market to regain the ground it had lost during the crisis and until late 2016 for house prices to climb back to their 2007 peak. The crisis wiped investment banking from Wall Street: The largest investment banks were either bought out or opted to become commercial banks regulated by the Federal Reserve. This did not protect them from having to pay government agencies some $150 billion in financial settlements and

[3] See Jacobs (1999b) and Jacobs and Levy (2005).

[4] Jacobs and Levy suggested that investors should consider their aversion to the unique risks of leverage explicitly, just as they consider their aversion to volatility, when forming portfolios. Restraining leverage may dampen the effects of instruments and strategies that have the potential to destabilize financial markets. See Jacobs and Levy (2013, 2014a, 2014b).

penalties for misrepresenting the real risks of the mortgage products they had sold during the housing boom.

Free-lunch financial products, with their promise of low risk and high returns, can seem appealing, attracting investment assets and encouraging leverage. When the risk reduction relies on the ability to shift risk, however, these products can pose problems for themselves and their markets because the ability to shift risks to other investors is often based on an illusion of liquidity. This illusion is enhanced when opacity and complexity obscure the true nature of the risk and is often dispelled when the products contain explicit or implicit trigger points calling for sudden changes in investment behavior. At that point, the result can be large-scale liquidations of leveraged assets at fire-sale prices, inducing a crash. It then becomes apparent that the safety promised by supposedly safe free-lunch products was merely an illusion. Products and strategies sharing a few or all of these characteristics have led to financial crises in the past. Attempts to avoid or contain future financial crises may be more successful by focusing on these characteristics.

REFERENCES

Jacobs, B. 1998. "Option Pricing Theory and Its Unintended Consequences." *The Journal of Investing* 7 (1): 12–14.

——. 1999a. *Capital Ideas and Market Realities: Option Replication, Investor Behavior, and Stock Market Crashes*. Malden, MA: Blackwell.

——. 1999b. "When Seemingly Infallible Arbitrage Strategies Fail." *The Journal of Investing* 8 (1): 9–10.

——. 2004. "Risk Avoidance and Market Fragility." *Financial Analysts Journal* 60 (1): 26–30.

——. 2009. "Tumbling Tower of Babel: Subprime Securitization and the Credit Crisis." *Financial Analysts Journal* 65 (2): 17–30.

——. 2018. *Too Smart for Our Own Good: Ingenious Investment Strategies, Illusions of Safety, and Market Crashes*. New York: McGraw-Hill.

Jacobs, B., and K. Levy. 2005. "A Tale of Two Hedge Funds," in *Market Neutral Strategies*, edited by B. I. Jacobs and K. N. Levy, pp. 147–172. New York: Wiley.

——. 2013. "Leverage Aversion, Efficient Frontiers, and the Efficient Region." *The Journal of Portfolio Management* 39 (3): 54–64.

——. 2014a. "Traditional Optimization Is Not Optimal for Leverage-Averse Investors." *The Journal of Portfolio Management* 40 (2): 1–11.

——. 2014b. "The Unique Risks of Portfolio Leverage: Why Modern Portfolio Theory Fails and How to Fix It." *Journal of Financial Perspectives* 2 (2): 113–126.

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