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RESTORING FINANCIAL STABILITY

How to Repair a Failed System

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NEW YORK UNIVERSITY
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To Manjiree

—V.V.A.

To my best friend and love of my life, Julie, and our three wonders, Jack, Charlie, and Lucas.

—M.R.

Foreword

As 2008 was drawing to a close, we were reflecting on the dramatic and often unprecedented events of the past year in financial markets and the broader economy. Nothing like this had occurred in our lifetimes. In our academic world, few events have had as much potential for providing us and our colleagues with a rich source of raw material for good research and teaching for a long time to come. This is the ultimate teachable moment, and it is essential to teach it. We were in the middle of a financial and economic hurricane that was certain to leave behind massive financial and economic damage. It will eventually blow over, as all hurricanes do, but it is not too early to begin to think about what changes to the system can mitigate the damage and, it is hoped, make future financial storms less likely.

With one of the largest and best faculties in the world focused on finance, economics, and related disciplines—academics deeply rooted in their respective disciplines and also heavily exposed to the practices of modern financial institutions—we thought that the financial crisis provided a unique opportunity to harness our collective expertise and make a serious contribution to the repair efforts that are getting under way. We convened a small group of interested faculty, the idea caught on, and we decided to execute this project. All faculty members in the relevant disciplines at the Stern School of Business were invited to participate if they had the time and the interest, and 33 colleagues did so (participants are listed at the end of this volume).

Next, key topics related to the crisis and its resolution were identified, and individual teams of authors set to work. As a common format we used the white paper. Each starts by discussing the nature of the problem, where things went wrong, and where we are today, and then goes on to outline what options are available to repair the immediate damage and prevent a recurrence at the least possible cost to financial efficiency and growth, and offers a recommended course of action with respect to public policy or business conduct. Each white paper (many of which are substantially more definitive than we initially envisaged) is accompanied by a short, easily accessible Executive Summary, published separately in New York University Salomon Center's academic journal *Financial Markets, Institutions & Instruments* (Blackwell, 2009). Each white paper was intensively debated both formally and informally among the group over six weeks or so, although no attempt was made to enforce uniformity of views.

This has been a unique opportunity to bring our cumulative expertise to bear on an overarching set of issues that will affect the national and global financial landscape going forward. We know that the repair process in the months and years to come will be highly politicized, and that special interests of all kinds will work hard to affect the outcomes. We also know that some of those entrusted with the repair have also been responsible for some of the damage. So we present here a set of views that are at once informed, carefully considered and debated, independent, and focused exclusively on the public interest.

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New York University Stern School of Business

New York, New York
February 2009

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A Bird's-Eye View

The Financial Crisis of 2007–2009: Causes and Remedies

Viral V. Acharya, Thomas Philippon, Matthew Richardson, and Nouriel Roubini

The integration of global financial markets has delivered large welfare gains through improvements in static and dynamic efficiency—the *allocation* of real resources and the *rate* of economic growth. These achievements have, however, come at the cost of increased systemic fragility, evidenced by the ongoing financial crisis. We must now face the challenge of redesigning the regulatory overlay of the global financial system in order to make it more robust without crippling its ability to innovate and spur economic growth.

P.1 THE FINANCIAL CRISIS OF 2007–2009

The financial sector has produced large economic efficiencies because financial institutions, which play a unique role in the economy, act as intermediaries between parties that need to borrow and parties willing to lend or invest. Without such intermediation, it is difficult for companies to conduct business. Thus, systemic risk can be thought of as widespread failures of financial institutions or freezing up of capital markets that can substantially reduce the supply of capital to the real economy. The United States experienced this type of systemic failure during 2007 and 2008 and continues to struggle with its consequences as we enter 2009.

When did this financial crisis start and when did it become systemic?

The financial crisis was triggered in the first quarter of 2006 when the housing market turned. A number of the mortgages designed for a subset of the market, namely subprime mortgages, were designed with a balloon interest payment, implying that the mortgage would be refinanced within a short period to avoid the jump in the mortgage rate. The mortgage refinancing presupposed that home prices would continue to appreciate. Thus, the collapse in the housing market necessarily meant a wave of future defaults in the subprime area—a systemic event was coming. Indeed, starting in late 2006 with Ownit Mortgage Solutions' bankruptcy and later on April 2, 2007, with the failure of the second-largest subprime lender, New Century Financial, it was clear that the subprime game had ended.

While subprime defaults were the root cause, the most identifiable event that led to systemic failure was most likely the collapse on June 20, 2007, of two highly levered Bear Stearns–managed hedge funds that invested in subprime asset-backed securities (ABSs). In particular, as the prices of the collateralized debt obligations (CDOs) began to fall with the defaults of subprime mortgages, lenders to the funds demanded more collateral. In fact, one of the funds' creditors, Merrill Lynch, seized $800 million of their assets and tried to auction them off. When only $100 million worth could be sold, the illiquid nature and declining value of the assets became quite evident. In an attempt to minimize any further auctions at fire sale prices, possibly leading to a death spiral, two days later Bear Stearns injected $3.2 billion worth of loans to keep the hedge funds afloat.

This event illustrates the features that typify financial crises—a credit boom (which leads to the leveraging of financial institutions, in this case, the Bear Stearns hedge funds) and an asset bubble (which increases the probability of a large price shock, in this case, the housing market). Eventually, when shocks lead to a bursting of the asset bubble (i.e., the fall in house prices) and trigger a process of deleveraging, these unsustainable asset bubbles and credit booms go bust with the following three consequences:

1. The fall in the value of the asset backed by high leverage leads to margin calls that force borrowers to sell the bubbly asset, which in turn starts to deflate in value.
2. This fall in the asset value now reduces the value of the collateral backing the initial leveraged credit boom.
3. Then, margin calls and the forced fire sale of the asset can drive down its price even below its now lower fundamental value, creating a cascading vicious circle of falling asset prices, margin calls, fire sales, deleveraging, and further asset price deflation.

Even though Bear Stearns tried to salvage the funds, the damage had been done. By the following month, the funds had lost over 90 percent of their value and were shuttered. As we know now, this event was just the tip of a very large iceberg that had already been created.

Coincident with the fate of these funds, there was a complete repricing of all credit instruments, led by the widening of credit spreads on investment grade bonds, high yield bonds, leverage loans via the LCDX index, CDOs backed by commercial mortgages via the CMBX, and CDOs backed by subprime mortgages via the ABX.[1] This led to an almost overnight halt on CDO issuance. As an illustration, Figure P.1 graphs an increase of over 200 basis points (bps) in high yield spreads between mid-June and the end of July 2007 and an almost complete collapse in the leveraged loan market.

Although it is difficult to tie the credit moves directly to other markets, on July 25, 2007, the largest, best-known speculative trade, the carry trade in which investors go long the high-yielding currency and short the

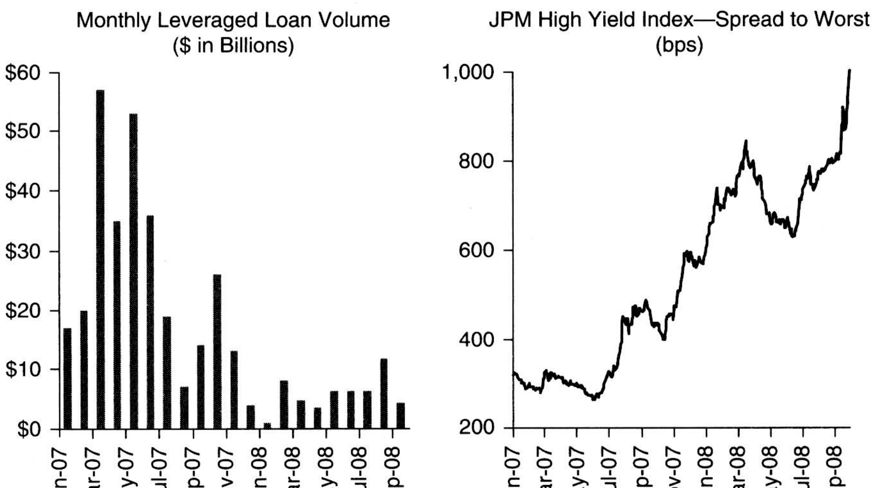

FIGURE P.1 Leveraged Finance Market (January 2007 to September 2008)

These graphs show the monthly leveraged loan volume and the spread on the yield to worst on the JPMorgan High Yield Index over the period January 2007 to September 2008. The yield to worst on each bond in the index is the lowest yield of all the call dates of each bond.

Source: S&P LCD, JPMorgan.

low-yielding one, had its largest move in many years. Specifically, being long 50 percent each in the Australian dollar and New Zealand kiwi and short 100 percent in Japanese yen lost 3.5 percent in a single day. The daily standard deviation over the previous three years for this trade had been 0.6 percent. It was, in short, a massive six standard deviation move. It is now widely believed that hedge fund losses in the carry trade, or perhaps a shift in risk aversion, led to the next major event—the meltdown of quantitative, long-short hedge fund strategies (value, momentum, and statistical arbitrage) over the week of August 6, 2007. A large liquidation the previous week in these strategies most likely started a cascade that caused hedge fund losses (with leverage) on the order of 25 to 35 percent before recovering on August 9.

The subprime mortgage decline had truly become systemic.

And then it happened. For over a week, there had been a run on the assets of three structured investment vehicles (SIVs) of BNP Paribas. The run was so severe that on August 9, BNP Paribas had to suspend redemptions. This event informed investors that the asset-backed commercial papers (ABCPs) and SIVs were not necessarily safe short-term vehicles. Instead, these conduits were supported by subprime and other questionable credit quality assets, which had essentially lost their liquidity or resale options.

BNP Paribas' announcement caused the asset-backed commercial paper market to freeze, an event that most succinctly highlights the next major step to a financial crisis, namely the lack of transparency and resulting counterparty risk concerns.

Consider the conduits of BNP Paribas. For several years, there had been huge growth in the development of structured products, ABCPs and SIVs being just two examples. However, once pricing was called into question as subprime mortgages defaulted, the conduit market faced:

- New exotic and illiquid financial instruments that were hard to value and price.
- Increasingly complex derivative instruments.
- The fact that many of these instruments traded over the counter rather than on an exchange.
- The revelation that there was little information and disclosure about such instruments and who was holding them.
- The fact that many new financial institutions were opaque with little or no regulation (hedge funds, private equity, SIVs, and other off-balance-sheet conduits).

Given that there was little to distinguish between BNP Paribas' conduits and those of other financial institutions, the lack of transparency on what