Introduction

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Samuel Johnson once observed that "when a man knows he is to be hanged in a fortnight, it concentrates his mind wonderfully." So does the experience of a near-total financial collapse, especially when it triggers a long and deep recession and only hastily improvised and drastic actions by the Federal Reserve and the U.S. Treasury are able to ward off an even worse catastrophe. Naturally, then, more has been said and written about the financial crisis of 2008 to 2009 than anyone can hear or read. But the research and reflections described in this book are different, and perhaps more ambitious, than the usual fare. They aim to reconsider the way we think about financial activity, especially its two-way connection with the real economy of production, consumption, capital formation, and employment. Any such rethinking will, of course, have implications for financial regulation.

People sometimes forget that financial activity is a means, not an end in itself. Its function is to make the real economy work more efficiently, that is, to allow more final output to be produced from the resources at hand. When the financial system fails, the damage that matters is not so much the financial disruptions per se, but rather the damage done to the real economy. A recession is only one of several possible routes to such damage, but it is a particularly visible and painful one.

In tranquil times, the financial system makes the real economy work better in at least five overlapping ways. First, it collects the economy's savings, wherever they originate, and places them at the disposal of the most profitable investment opportunities available. For example, without this intermediation, a pension fund in Oregon could not easily invest in a timber company in Georgia. Second, the financial system transfers risks that arise inevitably in the real economy from those who find them impossible or difficult to bear to those who, for a reasonable price, are willing to take their chances. Insurance policies are perhaps the most obvious example of risk transference, but banks—which give households safe deposits and invest the proceeds in risky loans—have been in this business for centuries. Third, financial markets provide liquidity for owners of assets, making it easier for them to sell assets for cash when needed. Fourth, in the course of doing these things, the financial system reveals information about the market's evaluation of various risks

and prospects for profit. If it is unbiased and reasonably accurate, this information helps guide the private and public decisions connected with the intermediation, risk transference, and liquidity provision functions already mentioned. And fifth, if the first four functions all work well, the financial markets help society allocate capital appropriately.

When these five functions are carried out smoothly and effectively, the financial sector earns its keep. And there is much evidence, especially from the experience of emerging economies, to demonstrate that failure hurts. In the years of the Great Moderation (1984 to 2007) that preceded the financial crisis, the belief became widely accepted, even in policy circles, that the modern financial system functioned well and was substantially self-regulating. It could safely be left to itself, and if left to itself, it would perform its standard functions efficiently and would not be seriously vulnerable to runaway asset bubbles or to the kind of breakdown and collapse that would inflict serious damage on the real economy.

This belief was embodied in the "strong" form of the efficient-market hypothesis (EMH). Here is a clear statement of the strong form from one of its principal advocates:

> In an efficient market, competition among the many intelligent participants leads to a situation where, at any time, actual prices of individual securities already reflect the effect of information based both on events that have already occurred and on events which, as of now, the market expects to take place in the future. In other words, in an efficient market at any point in time the actual price of a security will be a good estimate of its intrinsic value.[1]

And that "good estimate," in turn, gets capital flowing to good uses and away from bad ones.

The financial crisis and its aftermath make this view of the system, along with its implications that financial markets are self-regulating and stable, look like a caricature. If that is what people really thought, then Rethinking Finance is surely in order. It has become a commonplace to say that "a serious mispricing of risk" lay at the heart of the crisis, which would seem to be a direct contradiction of the strong EMH. Some of the chapters in this book investigate precise ways in which the EMH either works or fails; others are concerned with what a reconceived regulatory system might look like.

The chapter by Burton Malkiel concentrates, instead, on the "weak" form of the EMH. Malkiel was one of the early advocates of efficient-market theory but—and this is a very big "but"—his preferred version of the theory insists only that securities markets are efficient in the narrow sense that opportunities for arbitrage arise rarely and are eliminated quickly. This weak EMH does not claim that security prices always represent intrinsic values properly, but only that the market itself offers no hint as to whether current security prices are above or below their intrinsic values. The weak EMH is therefore compatible with the existence of bubbles, positive or negative. It just says that it's remarkably hard to "beat the market."

Yet the weak EMH is hardly vacuous. It has major implications for public policy, even if they are not quite as sharp as those of the strong version. In particular, the weak EMH says that governments have no reason to intervene directly in securities markets unless they have information (about the relation of prices to fundamental values) that is not available to the public at large. And even in that case, there is an obvious alternative: simply make the information publicly available. Malkiel points out that, under the weak EMH, it is difficult to know if a sustained price rise represents a bubble or a price movement driven by fundamentals. If it is a bubble, however, its eventual collapse will be especially dangerous if it has been financed by high levels of debt. Thus, avoiding the buildup of excessive leverage is a legitimate objective of financial regulation even under the weak EMH.

Shefrin and Statman reconsider the theory of efficient markets, in both strong and weak forms, from the perspective of behavioral finance. They argue, first, that neither version of the EMH can be held responsible for the crisis—if only because most participants in capital markets did not believe in them, or acted as if they did not. After all, it is departures from efficiency that enable (some) market participants to earn abnormal returns. But EMH may have been conflated in the minds of the public with a widespread belief in free or unregulated markets—which did stand in the way of necessary regulation.

Shefrin and Statman discuss some standard psychological mechanisms, such as tendencies toward self-confirmation and herd behavior, that are likely to lead to unstable capital markets. These possibilities were raised decades ago by John Maynard Keynes, Hyman Minsky, and others, but vanished from view under the influence of the EMH and its close macroeconomic cousin, rational expectations. There is hardly anything new in the combination of (a) the individually rational tendency to head for the lifeboats at the first sign of trouble; (b) the herd instinct that wants to head for the lifeboats when others do so; and (c) the radical uncertainty, especially about the solvency of others, that surrounds financial crises. It is all part of standard bank-run scenarios, just as it was when Walter Bagehot wrote his classic *Lombard Street* in the nineteenth century. Brad DeLong's chapter exploits this broad similarity to place current thinking about financial instability and crisis in historical perspective. This is also a useful way to draw attention to the differences created by changes in institutions and in financial technology.

What has emerged is characterized by Shefrin and Statman as a "tug-of-war" between those who favor free markets and those who favor regulation. Everyone is aware that financial regulation is bound to be imperfect and therefore to impose costs. But those costs must be weighed against the enormous real social costs of even occasional financial breakdowns. For example, the Congressional Budget Office estimates that the Great Recession and the sluggish recovery that followed it have already cost the U.S. economy over $3.5 trillion (in 2005 dollars) in lost output. By the time the economy is back to full employment, the total could easily surpass $6 trillion, which is about 40 percent of a year's real GDP. That's an enormous number compared to standard estimates of efficiency losses from taxation or regulation.

In the United States, the financial sector has recently been growing larger and becoming more costly and more exotic, as the chapter by Thomas Philippon shows. This development raises further questions. Does the increasing size of the financial services sector reflect an increasing contribution to the efficiency of the real economy? Or is at least some of the stunning growth in finance parasitic—using more resources, especially skilled labor and human capital, than its contribution can justify? Philippon points toward the latter explanation, the chapter by Robert Jarrow gives a mixed answer, and the chapter by Patrick Bolton, Tano Santos, and José Scheinkman highlights one particular area in which unregulated, opaque financial activity generates profits by building an information barrier between insiders and retail investors. Such barriers constitute a classic inefficiency.

The book begins with the keynote address delivered by Federal Reserve chairman Ben Bernanke, who has been, in his academic life, a major figure in the analysis of the relation between the financial sector and the real economy, especially via the so-called credit channel. It was great good luck for the nation that its top central banker in 2008, as one of the foremost students of the financial and economic collapse of the 1930s, had vowed not to let it happen again.[2]

In his talk, Bernanke pointed to critical sources of vulnerability in financial institutions that were already visible before the crisis hit: their heavy dependence on short-term—even overnight—funding, their use of very high leverage, and their reliance on risk management techniques that were inadequate for complex financial products and, especially, for the interconnectedness of the whole system through interlocking debtor–creditor relations. The regulatory and supervisory arrangements either ignored these danger signals or proved inadequate to the tasks of heading off the financial collapse and then of defending the real economy against its consequences. Gaps had been allowed to open up in the statutory structure of regulation. On top of that, the response of existing regulatory bodies was weak and slow.

The chapter by Simon Gilchrist and Egon Zakrajšek makes a strong case that the macroeconomic response to the financial crisis was too little too late. They first quantify the often slippery notion of financial stress and then embed it in a macroeconomic model that can, in principle, throw some light on two aggregative questions: How and how strongly does financial stress harm the real economy? And how, in turn, do events in the real economy create or diminish financial stress? Their analysis suggests that causation is strong in both directions.

Gilchrist and Zakrajšek measure financial stress by the interest rate spreads that financial institutions have to pay on their own borrowing, over and above what would be normal at the current stage of the business cycle.[3] When they include this measure in a vector autoregression, which is the standard atheoretical way of accounting for the main macroeconomic time series, they find that it plays a quantitatively significant role both as cause and as effect. An exogenous increase in the financial stress index brings about a corresponding deterioration in the real economy—lower output, higher unemployment, and some downward pressure on the price level. In turn, when the economy encounters difficulties from other sources, the measure of financial stress rises. When Gilchrist and Zakrajšek include

their index of financial stress in a conventional macroeconomic model, with a financial sector added, they find that adding the stress variable clearly improves the model's ability to explain recent events.

Finally, they conduct a fascinating simulation experiment. The model includes a "Taylor rule" that instructs the Fed to ease (tighten) monetary policy when the output gap increases (decreases) or the rate of inflation falls (rises). When Gilchrist and Zakrajšek modify the rule to require the Fed also to ease (tighten) when the index of financial stress increases (decreases), the policy response is so much stronger and faster that it reduces the recessionary fall in output and employment by about two-thirds. This eye-catching result is, of course, model-dependent; it will have to be checked for robustness. At a minimum, however, it points to great potential gains in macroeconomic performance from taking account of financial instability.

The chapter by Christopher Foote, Kristopher Gerardi, and Paul Willen takes a close look at one particular piece of financial technology that malfunctioned badly: the mortgage mess. Dodgy mortgages were, of course, at the epicenter of the crisis. It was a story of bad decisions and aftereffects that were devastating to the real economy. Many families found themselves overburdened by mortgages that they could not afford and that often exceeded the value of their house. The result has been waves of foreclosures, and the overhang of foreclosures has kept home building deeply depressed. All this is well known. Rather than review it, the chapter asks an important analytical question: were predatory lending practices and the practice of securitizing and offloading mortgage loans at the heart of the crisis? Their surprising and controversial answer: no.

This conclusion is not a whitewash of NINJA loans, teaser rates, and all that. The question is not about personal losses or improprieties, of which there were many, but about responsibility for the meltdown. The chapter provides evidence, for instance, that default rates on adjustable rate mortgages were not that much higher than those on fixed rate loans. One major reason is that, as interest rates fell across the economy, many of the resets were downward. Instead, Foote, Gerardi, and Willen lay the blame on the bubble itself, in particular on the epic underestimation of the probability that house prices would ever fall. They cite internal documentary evidence that buyers and sellers of mortgage-backed securities (MBSs) understood rather well that disaster would follow if house prices were to drop sharply. They simply did not believe that could happen. So we are back to general instability and the economics of bubbles.

The evolution of the pre-crash financial system is in part a story of financial innovation, the invention and diffusion of novel instruments and techniques for financing investment and managing wealth and risks. Some of this innovation was motivated by the desire to escape regulation; it was part of the aforementioned regulatory tug-of-war. The four chapters of part III concentrate on interesting aspects of financial innovation, their value to the real economy, and the pitfalls they create.

As already mentioned, Philippon documents not only the sheer increases in the size of the financial services industry relative to real GDP but also the increasing cost per unit of intermediation. Despite the large-scale introduction of information

technology hardware and software, there does not appear to have been any corresponding improvement in the real productivity of financial activity. To paraphrase something one of us wrote many years ago, computers seem to have been everywhere except in the industry's productivity statistics.[4]

Philippon makes an unfavorable comparison with retail and wholesale trade, where the introduction of IT has indeed improved productivity dramatically. His suggestion is that the financial sector's growing use of skilled labor and information technology has mainly supported a huge increase in the volume of trading. More trading activity may enhance liquidity and perhaps even improve the information content of prices, but he sees little evidence that it has measurably improved the efficiency of the real economy.

Robert Jarrow's chapter looks in detail at some of the major types of exotic securities developed by financial engineers and describes how they work. Asset-backed securities (ABSs) are securities that provide claims to a collection of non-traded assets; collateralized debt obligations (CDOs) are backed by collections of traded assets and usually have a more complicated structure than ABSs; credit default swaps (CDSs) are essentially a way for one party to pay another to accept the risk of default on a particular debt obligation—or to make bets on or against default.

Jarrow asks—and attempts to answer—the most important question about the social utility of these securities: do these classes of credit derivatives make it possible to conduct real economic activity more efficiently? He concludes that ABSs are or can be reasonably transparent and that they serve a useful purpose: enlarging the potential supply of capital for mortgages, student loans, and so on. CDSs provide the risk-sharing properties of insurance generally, and their availability presumably enlarges and perfects bond markets. Jarrow even justifies the controversial "naked CDS," in which neither party has an insurable interest in the event that is being insured against, on the grounds that CDS prices have useful information content.

On the other hand, he concludes that CDOs, because they are excessively complex and because their underlying assets are already traded, probably add little or nothing to the efficient functioning of either the capital market or the real economy. He also suggests that credit derivatives should be traded and cleared on public exchanges, where market participants could be required to post adequate capital and transaction prices, volumes, and counterparty exposures would be public knowledge. The absence of such knowledge certainly added to the rampant uncertainty that led to market meltdowns during the financial crisis.

In financial markets, as in others, absence of information and the existence of information asymmetries among participants tend to destroy efficiency—both in good times and in bad. Since financial innovation often generates novel and highly complex securities, it is socially desirable that there be an easily available and unbiased source of information about their risk-return characteristics. This is the role of the rating agencies, of which there are currently three major ones: Moody's, Standard & Poor's, and Fitch. The chapter by John Hull and Alan White

considers the institutional role of these agencies and the techniques they use to rate securities.

The purpose of a rating is to provide prospective investors with a grade (AAA, B+, etc.) that enables them to place the security in the same risk class as other, more familiar, securities. Such information is particularly vital when it comes to novel and complicated securities. Hull and White point out that the indicator of underlying risk used by Moody's was substantively different from (though related to) the indicators used by the other two agencies. This fact, along with the uncertainty that inheres in any rating system, opened the door to ratings shopping, whereby issuers searched for the most favorable ratings.

This worry, in turn, opens up the question of how rating agencies are compensated for their work. When, as now, the agencies are paid by the issuers, an immediate conflict of interest arises that can undermine the whole system. Compensation from the consumers of ratings would seem to be more appropriate, but it is not feasible because of the free-rider problem. Why should anyone buy a rating when, once it's out there, he can probably get it for free? And in that case, who pays the rating agency for its work? Hull and White look for ways to improve the current system. One alternative has recently been proposed in the United Kingdom: encourage the entry of more agencies and require issuers to rotate among them. Another alternative would be to force complex derivatives to be traded on exchanges and have the exchanges hire and assign rating agencies. In fact, once credit derivatives become standardized and exchange-traded, this may eliminate the need for ratings altogether.

Part IV turns explicitly to regulatory matters. The chapter by Robert Litan reviews briefly the logic of industrial regulation in general and then looks at what the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 accomplishes, what it partly accomplishes, and what it leaves unaddressed. His accent is on the political economy of financial regulation, that is, the interplay between powerful private interests and the needs of public policy. Like many other observers, Litan argues that several regulatory failures contributed to the onset of the crisis, or at least allowed it to become worse than it might otherwise have been. Some of these weaknesses came in response to pressures from the industry, while others were results of regulatory fragmentation and other failings. But those are all bygones.

Litan goes on to consider a number of remedies that have been proposed, ranging from more, and more competent, oversight to higher capital standards. Many of these ideas have found a place in Dodd-Frank, though their exact shape and likely effectiveness will have to wait for details to be determined by the relevant regulators. He points out that interest-group pressure is intense. Two salient examples are the campaigns by the industry to expand the class of exemptions from clearing rules for derivatives and to weaken the so-called Volcker Rule against proprietary trading by commercial banks. These struggles may never end. Just one month after the conference, huge trading losses at JPMorgan Chase brought these issues into sharp relief once again. Was it proprietary trading or hedging that went wrong?

The bottom line, according to Litan, is that Dodd-Frank will turn out to be an imperfect patchwork, which is more or less inevitable given the harsh political economy of financial regulation. Dodd-Frank will not prevent the next financial crisis. But it may well delay the onset and diminish its amplitude. That in itself would be welcome. Be thankful for small favors.

The chapter by Kevin Murphy serves two purposes. It evaluates the widespread belief that the "bonus culture" on Wall Street created incentives for excessive risk-taking at the top—which many believe helped mightily in setting the table for the crisis. (His verdict is negative.) It also considers possibilities for the regulation of executive compensation in the financial services.

Murphy documents the enormous bulge in the compensation of the CEOs of the large broker-dealer firms that occurred from about 1995 until the crisis struck. But Murphy argues that this observation does not imply that CEO bonuses induced excessive risk-taking. In fact, those famous—or is it infamous?—CEOs had huge equity stakes in their firms. So they were by no means protected from the downside of excessive risk-taking. Instead, the more likely place to look for perverse incentives is lower down the scale, particularly among traders in the large firms. That danger is traceable not to bonuses per se, but rather to tying compensation to short-run trading profits rather than to longer-run measures of profitability. The obvious remedy is for traders' compensation agreements to contain clawback provisions if trades that are profitable at first go sour later on.

As Murphy points out, that is easier said than done: taxes will have been paid in the meanwhile, and some traders will have changed jobs. Although he describes some ways in which this sort of short-termism can be mitigated, in the end he regards most attacks on high Wall Street compensation as motivated by jealousy, primarily punitive in intent, and unlikely to improve matters.

A book like this, the work of many minds, cannot follow a single line of argument to a single, unified set of conclusions. Our reading of the various chapters does lead, however, to a handful of tentative implications that we list here for others to mull over.

1. Left to itself, the financial sector is likely to grow to a size and complexity that serves its own interests, using up resources and creating instabilities that may outweigh its contributions to real economic efficiency.
2. Such prospects may be particularly prevalent in financial innovation. While many of the products of financial engineering are indeed useful in managing real economic risks, others serve mainly as opportunities to exploit superior information and analytical capacity at the expense of less informed or less competent players.
3. Those same opportunities can lead to extraordinarily generous compensation packages, often based on making short-term killings, that may skew decisions in favor of short-horizon gains rather than long-horizon growth.
4. Such a complex, interconnected, and highly leveraged financial system evinces tendencies toward instability that may occasionally inflict serious damage on

the real economy. So the need for regulation is real. So is the need for central banks to take financial innovation and instability into account when formulating monetary policy.

5. Regulators should not be paralyzed by the realization that it is hard to tell a bubble from a well-justified rise in some relative prices. Here, as everywhere, there are two kinds of error—acting when one shouldn't, and failing to act when one should. The costs and benefits of the two sorts of error have to be appraised and balanced.
6. Society should be exploring new ways to rate complex securities, to compensate rating agencies, and to compensate traders. Even allowing for some learning from past errors, current arrangements leave much to be desired.
7. More broadly, we now realize that the global economy is indeed a system, meaning that its individual components are connected and interact in dynamic ways. When those interactions either fail or are interrupted, the consequences can be disastrous. In particular, the macroeconomy and the financial system are inextricably linked, and the importance of the so-called shadow banking system for providing individuals and institutions with liquidity and leverage also creates vulnerabilities when panic sets in and fire sales are triggered.

These observations highlight the benefits of sifting through the wreckage and systematically piecing together the causal factors that created one of the worst economic disasters of the last century. As George Santayana put it, "Those who cannot learn from history are condemned to repeat it." We are grateful to the talented authors of the insightful contributions in this volume for helping us rethink finance, and we hope their fresh perspectives will motivate current and future generations of scholars to continue with this critical research agenda.

NOTES

1. Eugene Fama, "Random Walks in Stock Market Prices," *Financial Analysts Journal*, 21(5, 1965): 56.
2. Ben S. Bernanke, "On Milton Friedman's Ninetieth Birthday," remarks at the conference to honor Milton Friedman, University of Chicago, November 8, 2002.
3. Spreads rise in cyclical downturns and fall in booms.
4. Robert Solow, "We'd Better Watch Out," *New York Times Book Review*, July 12, 1987, 36.