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978-1-108-83763-7 — The Financial Crisis of 2008
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Introduction

There can be few fields of human endeavor in which history counts for so little as in the world of finance.

John Kenneth Galbraith

The financial crisis of 2008 was initially seen by journalists, popular writers, the media, and some economists as the result of a housing bubble and subprime lending, funded by ill-structured private residential mortgage-backed securities (RMBS) that were exploitive of low-income mortgage borrowers.[1] In fact, the crisis was the product of multiple exaggerated financial developments. The private RMBS that funded the housing bubble included borrowers at all income levels and was only part of a massive increase in securitization that included commercial mortgage-backed securities (CMBS), collateralized debt obligations (CDOs), collateralized loan obligations (CLOs), and asset-backed commercial paper (ABCP). The housing bubble also facilitated an unprecedented increase in consumer borrowing that Mian and Sufi (2014) have documented and that I emphasize. The role of commercial real estate in the crisis has been little recognized and was mostly funded by institutional capital flows. There has been better recognition of the exaggerated increase in highly leveraged corporate debt, but its scale has been understated as has its unprecedented subordinated quotient. This expansion, too, was funded by institutional capital flows.

An important question is why the government-sponsored housing agencies – the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac) – the state and local government pension funds, the corporate pension funds, the

[1] Reinhart (2009); Sorkin (2009); Tett (2009); Zuckerman (2009); Lewis (2010); McLean (2010); Morgenson (2011); Blinder (2013); Shiller (2013); Mian (2014).

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insurance companies, and the commercial and investment banking intermediaries that serviced these institutions went along with these unusual capital flows and their deteriorating credit quality. Why did these parties fund them when they had unlimited information resources, paid constant attention to financial markets, and had their own stakes in the outcomes? Why weren't they worried? What were their regulators doing?

This book follows a systematic pattern of study through the pre-crisis and crisis years to explore these questions of investors, their financial intermediaries, and their regulators. Each chapter examines the consumer and housing, the economy, fiscal and monetary policy, and the various investment markets – the stock market, mortgage-backed securities markets, commercial real estate, highly leveraged corporate debt, private equity, mergers and acquisitions, hedge funds, derivatives, and commercial paper. It is similarly systematic in examining the institutions (especially state and local retirement funds) that drive these markets, and the financial firms that intermediate them. These intermediaries include Fannie Mae and Freddie Mac, commercial banks, investment banks, insurance companies, and European banks. The book studies the investment pressures and modern portfolio practices that pushed institutional investors into accepting greater leverage and risk and how difficult it was for them and their regulators to grasp what the weaknesses were with so many sectors in play.

The financing of the housing bubble needs to be looked at comprehensively rather than focusing on subprime mortgages. Between 2002–07, $18 trillion in residential mortgages was securitized, 38% of which were privately securitized. Fannie Mae and Freddie Mac securitized most of the balance. Thirteen percent of the private securitizations were subprime, but many securitizations had credit flaws whether they were based on subprime, Alt-A, jumbo, or conventional mortgages. The riskiest sectors of the mortgage expansion were financed under the belief that higher rates compensated for higher risks, even after allowing for higher defaults, a practice that often had produced superior returns in the past.

Households increased their mortgage debt by $5.4 trillion between 2002–07, of which $2.7 trillion was to take out appreciated equity for consumption, and they did it at increasingly higher house prices. People also invested aggressively in housing as 35+% of housing sales were for second or investment homes financed with unusual leverage.

Many economists and prominent authorities have seen the crisis as a run on the big banks as well as a quasi-bank run on the shadow banking system (weakly defined). The implication is that there were corresponding failures

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in monetary policy and financial regulation (Krugman, 2009; Eichengreen, 2016; Ball, 2018; Bernanke, 2019). Attention has been paid mostly to commercial and investment banks, asset-backed commercial paper, structured investment vehicles, and residential mortgages. Information about securities markets other than private RMBS has been highly generalized in these analyses.

Treating the crisis as a bank run is a familiar theoretical avenue for economists. It places the burden of policy response on the Federal Reserve as the lender of last resort and on regulation and reform to prevent recurrence. Aspects of the crisis resembled a bank run, such as the redemptions from the private RMBS funds sponsored by Bear Stearns, BNP-Paribas, and numerous other European banks, the loss of repo financing by Bear Stearns and Lehman Brothers, the inability to roll over some types of ABCP, the run on money market mutual funds, and the collateral demands on AIG. But broken business models shouldn't be treated as synonymous with bank runs. The failed RMBS funds were invested in the junior tranches of securitized mortgages and leveraged to improve returns. Bear Stearns and Lehman Brothers had stretched to extremes in commercial real estate and highly leveraged corporate debt. AIG was tripped up by an undisciplined financial operation in a London subsidiary. European banks and Citigroup set up structured investment vehicles that held long-term assets funded with ABCP to arbitrage interest rates. These vehicles' assets did not provide current cash flows to repay the commercial paper if it couldn't be rolled over. The repo markets were fundamentally unstable because the largest investing institutions were lending out 20–30% of their portfolios and reinvesting the cash collateral in the repo market or with money market mutual funds.

When broken business models threaten the whole economy it is central governments that step in rather than central banks. The Bank for International Settlements (the BIS) in December 2008 identified governments in sixteen developed countries that had guaranteed new bank debt or injected new capital into their banks (Domanski, 2008). The USA was a leader in this respect, nationalizing Fannie Mae and Freddie Mac, virtually taking over AIG, using the Troubled Asset Relief Program (TARP) to strengthen the banks' equity, guaranteeing all money market mutual funds, all business bank deposits, and new long-term debt for all of the major financial firms, and back-stopping huge pools of risky assets at Citigroup and Bank of America.

The bank run analogy has two problems. It does not explain the biggest failures of all – Fannie Mae and Freddie Mac with $5 trillion of debt and

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guaranteed mortgage obligations. Bank runs had nothing to do with the collapse in housing prices and commercial real estate, nor with the prices of private RMBS, CMBS, and highly leveraged corporate debt. These problems caused dramatic losses at Bear Stearns, Washington Mutual, Countrywide, Merrill Lynch, Morgan Stanley, AIG, Citigroup, and Wachovia before Lehman Brothers' bankruptcy created the impression of a bank run.

Nor does analyzing the crisis as a bank run help us to understand why the largest, most sophisticated investors and their equally sophisticated financial intermediaries participated in the bubbles mentioned above. The answers lie in 1) modern portfolio practices and 2) inadequate conventional investment returns following the collapse of the dot.com bubble and the terrorist attacks of 9/11. Modern portfolio theory established the virtue of diversification to reduce risk and the Sharpe ratio that measured reward relative to risk, but these theories were turned on their head as institutions justified greater risk, particularly greater leverage, and greater illiquidity in a stretch for higher returns. The best performing institutional investor in the last thirty years, David Swensen at the Yale University endowment, strongly advocated investments in hedge funds, private equity, commercial real estate, and real assets (timber, farms, and oil & gas) (Swensen, 2009). These investments usually involved high degrees of leverage and illiquidity. Readers will have to weigh this interpretation of the crisis against claims that investors' are perennially unable to rationally evaluate financial risks (Shiller, 2013; Gennaioli, 2018).

The major investors in 2006 were state and local government and corporate pension funds overseeing $9 trillion of assets, insurance companies overseeing $6 trillion, and banks $3 trillion (Table 2.6).[2] Foundations and endowments were aggressive investors but only oversaw $0.5 trillion. All of these institutions generally required 7–8% returns on their investments to maintain their solvency (pensions), to sustain their spending habits (foundations), or for pricing their products and achieving earnings growth (insurance companies and banks). University endowments required similar returns to fund 30% of their institutions' budgets (Harvard, Yale, Princeton, and Stanford). But these returns did not appear available in conventional bond and stock investments after the hi-tech bubble and 9/11.

[2] Federal Reserve (Financial Accounts of the United States), L.109, L.116–119. Individual investors were minor. The Forbes 400 Richest Americans had an aggregate net worth of only $1.5 trillion in 2006 and the bulk of that was tied up in companies that they or their forebears founded.

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These various institutions and the commercial and investment bank intermediaries serving them increased their highly leveraged investments by almost $11 trillion between 2002–06 in a stretch for higher returns (Table 2.5). The $1.65 trillion increase in private RMBS was the largest percentage increase at 303%; but the $2.4 trillion increase in conforming mortgages was larger. So were the increase in commercial real estate if mortgages and equity are combined ($2.5 trillion) and the increase in combined private equity and highly leveraged corporate debt ($2.5 trillion). Hedge funds were the other fast-growing area at almost $1 trillion.

By the end of 2006, consumers were so extended in their debts and the institutional investment community and its financial intermediaries so imbedded in highly leveraged illiquid investments that it was impossible to reverse the situation without causing a major economic contraction. It would take five or six years for the situation to get resolved.

This history aims to contribute to our understanding of the crisis of 2008 and to provide insight into the behavior of financial markets between 2000–12. The nearest I come to theory is that leverage was the common denominator in most of the problems. Reinhart (2009) cites leverage as the common factor historically and in this crisis, but I describe leverage more broadly. Individuals increased their mortgages to draw out appreciated home equity and to purchase second/investment homes. Fannie Mae and Freddie Mac operated with leverage of 100 to 1 and were the largest subprime and Alt-A RMBS investors. The largest state and local retirement funds sought out the hidden leverage in commercial real estate, private equity, and hedge funds. Banks couldn't resist taking risks in these areas as the savvy intermediaries to the largest institutions. The leading US and European commercial banks accepted the leverage in private residential and commercial mortgages and the hidden leverage in the derivatives markets. Private equity funds induced record prices in the merger and acquisition market and funded their purchases with $2 trillion of highly leveraged corporate debt. In the aftermath of the crisis, much of the preceding leverage had to be unwound, especially among homeowners, commercial real estate, and highly leveraged corporate borrowers that, along with the huge wealth losses, stunted economic recovery.

There is a price, however, in being too theoretical. You miss things. The critical problem in the crisis was the decline in banks' asset quality and liquidity rather than their regulatory leverage. It is not incidental that the stock market gave strong approval to the accumulation of these assets until 2007 and that regulators had no ability to evaluate their quality. Poor management and weak corporate cultures were at fault at Bear Stearns,

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Lehman Brothers, Merrill Lynch, AIG, Citigroup, Wachovia, Countrywide, Washington Mutual, and General Motors. The leadership of Hank Paulson, Tim Geithner, Ben Bernanke, and Barack Obama was vital to ultimately restoring financial markets (Warren Buffett called their presence "luck"). There were numerous other nontheoretical factors. Fannie Mae and Freddie Mac were among the largest individual buyers of subprime RMBS, partly due to government regulations. The European banks were a large class of buyers of subprime RMBS because their home markets lacked similar medium-term instruments. AIG was a phenomenon of its own struggling to perform, driven by a once-charismatic CEO, Hank Greenberg. I am also struck by the very human belief in 2007 throughout the financial and regulatory communities that the myriad problems of the housing market, corporate leverage, and investment banking illiquidity could be contained.

Nor does theory answer why regulators were inactive as the excesses developed. There was a maze of regulators overseeing the various participants. The Office of Federal Housing Enterprise Oversight oversaw Fannie Mae and Freddie Mac; the Federal Reserve oversaw banks and financial holding companies; the Comptroller of the Currency oversaw national banks; the Federal Deposit Insurance Corporation oversaw banks at all levels; the Office of Thrift Supervision oversaw savings and loans (of which Washington Mutual, Countrywide, and IndyMac were prominent examples); the SEC oversaw investment banks, their holding companies, and mutual funds; the Department of Labor oversaw corporate pension funds; state Treasurers oversaw state and local government pension funds; state Attorney Generals oversaw not-for-profits and endowments; state insurance departments oversaw insurance companies. The only preemptive actions were by a number of state Attorney Generals who attacked predatory and discriminatory mortgage lending (Totten, 2015). There were no actions related to investment practices. Surely this inaction reflected that regulators did not have the resources to understand the complexities of modern finance, although it may have also reflected belief in the self-governing powers of free markets. Other possibilities are that regulators had been "captured" by the regulated; some doubted their authority, as Christopher Cox, Chairman of the SEC, claimed in the middle of the crisis.[3]

There are indications that many regulatory changes in this period helped foster the trends leading to the crisis:

[3] Cox, Christopher, testimony before the House Committee on Oversight and Government Reform, 10/23/08.

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- The federal government made a bipartisan push on Fannie Mae and Freddie Mac to assist low-income home ownership and their federal monitor thought they were well capitalized just as Hank Paulson was about to nationalize them.
- The Gramm-Leach-Bliley Act of 1999 dissolved the historic Glass-Steagall separation of commercial and investment banks and facilitated the growth in financial holding companies until the four largest had over 2,000 subsidiaries around the world.
- FDIC staff was reduced from 12,000 in 1995 to 4,500 in 2006, its bank inspections minimized, and its morale badly hurt.[4]
- The Commodities Futures Act of 2000 gave credit default swaps preference over traditional debts in bankruptcy making them a preferred speculative tool.
- The transition to Basel II international capital rules that allowed the major banks to internally calculate their own risk-weighted exposure led to capital arbitrage away from the common loans of the past into publicly rated asset-backed securities and highly leveraged off-balance sheet vehicles. Widespread acceptance of Basel II capital rules created a false image of safety because they failed to capture the deterioration in asset quality.
- The SEC amended the rules for broker-dealers' capital requirements in 2004 to include regulation at the holding company level, but with self-defined risk levels and vague enforcement. Christopher Cox, the SEC Chairman, eventually claimed that the SEC was not the regulator for 193 of the 200+ Lehman Brothers subsidiaries.

There was widespread dissatisfaction with the efforts of federal authorities during the crisis and the scale of the eventual economic recovery, but I disagree. There was unprecedented financial remediation (to fix or save the financial system as distinct from monetary, fiscal, or regulatory policy) during the crisis by the Bush administration and the Federal Reserve amounting to almost $14 trillion, equal to 100% of GDP. This remediation included $5 trillion in assumed obligations when the federal government took over Fannie Mae and Freddie Mac, over $5 trillion in guarantees for money market mutual funds, banks' commercial deposits, and financial institutions' bonds, and $750 billion for the Troubled Asset Relief Program (TARP). The Obama administration provided $1.5 trillion in fiscal stimulation, mostly in 2009 and 2010 when federal deficits were over 8% of GDP.

[4] Bair (2012), pp. 16–19.

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The Federal Reserve undertook $3.65 trillion in unusual monetary initiatives to stimulate the economy, expanding its balance sheet by $1.4 trillion in the crisis (QE-1), and by $750 billion in the second program of Quantitative Easing (QE-2). In the absence of further fiscal stimulus, the Federal Reserve initiated its third purchase program in 2013 (QE-3), adding another $1.5 trillion to its balance sheet.

These actions by the Bush and Obama administrations and the Federal Reserve produced historic recovery in the securities markets and 2% economic growth, but they could not overcome three overwhelming burdens:

1. Incremental debt of almost $10 trillion incurred by consumers and business between 2002–08, the largest elements of which were $5 trillion of home mortgage debt, $2 trillion of commercial real estate debt, $1.4 trillion of highly leveraged corporate debt, and $0.5 trillion of student debt (Tables 6.3 and 6.5).
2. The $23 trillion in lost wealth equal to over 200% of Personal Disposable Income, the largest elements of which were $10 trillion lost in stocks, almost $5 trillion lost on residential mortgages of all types, $4 trillion in highly leveraged corporate debt, including commercial real estate, and $3.5 trillion in housing (Table 6.2).
3. The stimulus efforts were unable to reach small business as measured by profits and confidence so that this sector representing half of the economy remained depressed.

It was not clear that even the US government could deploy enough resources to quickly overcome these millstones.

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1

The Heritage of the Hi-Tech Bubble 2000–2004

1.1 The End of the Millennium

Investors in 2000 looking back at the 1990s could have been pardoned for feeling euphoric. The S&P 500 (Chart 1.1) had risen 237% since 1992 – a compound annual rate of 16.4%. This gain followed a plethora of troubles at the end of the 1980s – the savings and loan crisis that corresponded with widespread commercial real estate problems; the collapse of the nascent junk bond market; the bankruptcy of Drexel Burnham, and the jailing of its hero, Michael Milken; and the military downsizing that followed the end of the Cold War. Anticipated earnings for the S&P 500 companies in the next year began to rise steadily in 1994 after a five-year hiatus, doubling during the rest of the decade (Chart 1.2) (more on the source of these estimates and their importance in conjunction with Chart 1.14).

The USA appeared to have a "Goldilocks" economy. Real GDP growth hovered around 4% with few hiccups. There was not a single quarter of GDP decline between 1992–9. The Federal Reserve opened its annual reports in the late 1990s with statements such as the following:

- "The economy performed reasonably well in 1995,"
- "The economy performed impressively in 1996,"
- "The US economy turned in another excellent performance in 1997,"
- "In 1998 the US economy again performed impressively,"
- "The US economy posted another exceptional performance in 1999."

Inflation appeared well managed as it dropped to 2%, having been the scourge of the two prior decades when it reached a peak of 17% in March 1980. The Federal Reserve in 1995 claimed that CPI inflation was ". . . less than 3 percent for the third consecutive year, the first such occurrence in thirty years," and proudly emphasized that ". . . there is no

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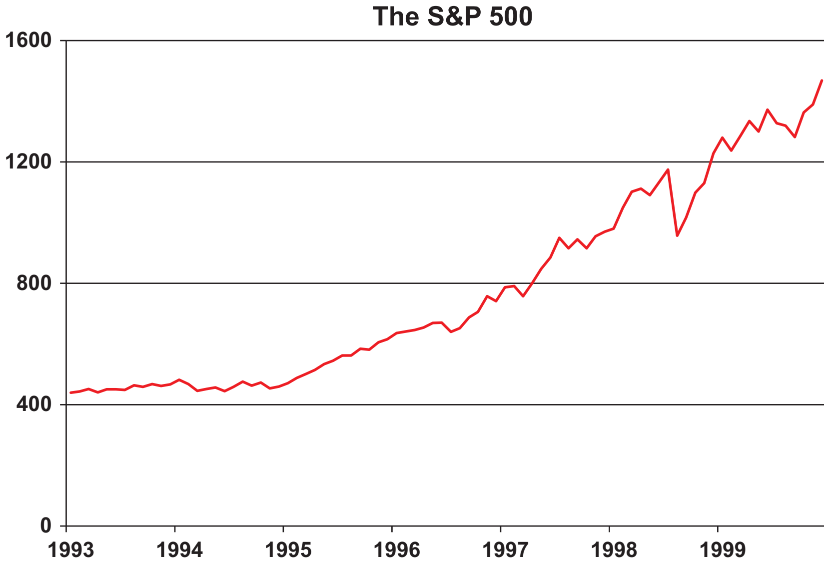
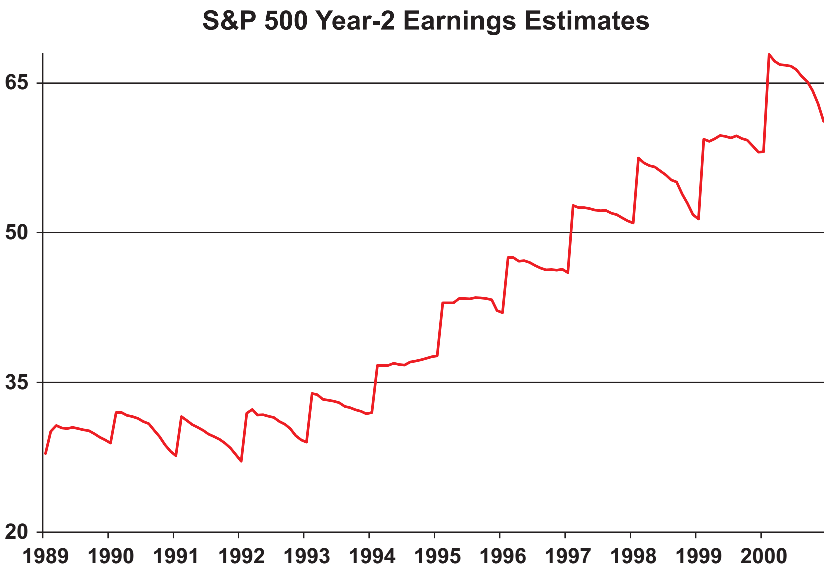
Chart 1.1



Source: Standard & Poor's Corp.

Chart 1.2



Source: IBES.

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