

Too Big to Manage? Two Book Reviews

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Roddy Boyd's *Fatal Risk: A Cautionary Tale of AIG's Corporate Suicide* and Greg Farrell's *Crash of the Titans: Greed, Hubris and the Fall of Merrill Lynch and the Near Collapse of Bank of America* are interesting and informative books about two of the large financial firms that got into trouble and played an important role in the recent financial crisis. American International Group (AIG) was bailed out by the Federal Reserve and the federal government while Merrill Lynch almost certainly would have failed if it had not been acquired by Bank of America over that tumultuous weekend in which Lehman Brothers failed.

Both books cover, from the perspectives of these two firms, the events leading up to and during the financial panic of the autumn of 2008. The descriptions are useful and entertaining, but there are many other books on the financial crises that cover these events too. What these two books do provide that many other books do not is a window into how these two large firms were run, how they grew leading up to the crisis, and what decisions were made or not made that got the firms into trouble. What I want to do in this review is to use the books' analyses of AIG and Merrill Lynch to give some insight into how large financial institutions are run, their risks, why some of them failed in the recent crisis, and the implications for too-big-to-fail policy.¹

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¹ Farrell's book covers much more than the buildup of risk that led to Merrill's near failure. It is also about John Thain's unsuccessful attempt to keep Merrill Lynch independent, its sale to Bank of America, and the ensuing after effects. It also discusses Bank of America, including some of its history. Because my interest in this review is limits on a person's ability to manage large financial firms, I won't discuss these parts of the book. Furthermore, in my mind, the history of Bank of America—and its

Both authors put the role of the CEO at the center of their stories. Boyd argues that AIG collapsed because the high-energy, aggressive Hank Greenberg built a firm with risks that his successor, Martin Sullivan, could not manage when he took over in 2005. Farrell argues that Merrill Lynch lost its independence because the ambitious, distant Stan O’Neal ripped up the old “Mother Merrill” culture when he took over in 2002. Like any good story, both books discuss the personalities of these leaders, their humble roots, how they interacted—or in some cases did not interact—with their subordinates, and how these character flaws contributed to the ending of their firms. These Shakespearean elements make for a good tragedy and, indeed, are essential to the story, but the focus on individuals runs the risk of hiding the real lesson of both books. In my view, both stories are ultimately about the limits of a leader’s span of control, that is, the scope and scale of people and activities that a person can effectively manage. Both books provide evidence that these firms were so large, leveraged, and complicated that mistakes by leadership were fatal when the mortgage market declined. What is not addressed in either book, however, is the equally important lesson of why these two firms were able to grow to become so large, leveraged, and complicated in the first place. Later in this article, I will argue that the answer to that question lies in 40 years of federal policy of bailing out large financial firms.

1. AMERICAN INTERNATIONAL GROUP

When American International Group (AIG) was bailed out by the federal government in September 2008, it was a \$1 trillion company with an astonishing reach. It operated worldwide, had a huge number of counterparties, and, in addition to supplying traditional insurance products like life insurance and property and casualty insurance, it leased aircraft, provided asset management services, sold annuities, insured stable value funds in pension plans, and was active in capital markets. It was involved in so many parts of the economy that it is not hard to see why it was viewed as too big to fail.

Boyd tells a convincing story about how AIG got to this point. He gives some background on the unusual history of AIG, but spends much of the book discussing Maurice “Hank” Greenberg, its CEO until

Queen City neighbor Wachovia—is really the story of the end of legal and regulatory restrictions on interstate and intrastate bank branching and the ensuing scramble among banks to be the “winner” in the acquisition game. For a book with more history of these two banks (as well as that of a third bank, the conservatively run “old” Wachovia), that gives some idea of why Charlotte of all places ended up as the second most important banking center in the United States, see Rick Rothacker’s *Banktown*.

2005, and the growth of the financial products group, AIGFP. This unit issued the credit default swaps (CDS) that, along with losses in AIG's securities lending unit, were the main causes of AIG's collapse.

AIGFP was set up in 1987 as a joint venture with Howard Sosin, a former academic and a trader with Drexel Burnham Lambert. The vision of AIGFP was to use the AAA rating of AIG to fund derivative transactions, like interest rate swaps, at a lower cost than its competitors, and for most of its years, AIGFP seemed to do this very well.² Boyd describes what AIGFP did, but he spends a lot of time talking about its leaders. He describes Sosin's strong-willed personality and his conflicts with Greenberg. He also covers the succeeding years after Sosin was forced out in 1993, when AIGFP was first run by the calm Minnesotan Tom Savage and then, starting in 2001, by the hard charging, intimidating Joseph Cassano.

The AIGFP transactions that did so much damage to AIG were part of its CDS portfolio, and actually only a small portion of it. A CDS is essentially an insurance contract written on the performance of some asset. AIGFP started providing CDS in 1998. These CDS were initially written on corporate debt, but over time AIGFP expanded the pool of assets it insured to include bank loans and, starting in 2004, collateralized debt obligations (CDO). A CDO is a security that receives cash from a trust that holds a bundle of loans, fixed-income securities, or other assets. From 2004 until the end of 2005, the CDOs that AIGFP insured included subprime mortgage-backed securities. Some of these CDS contained credit swap annexes that required AIG to post collateral if the value of the referenced security dropped in value. Downgrades to the referenced securities, as well as to AIG as a whole in 2008, required AIG to post large amounts of cash as collateral that it did not have in September 2008. The liquidity problems from these collateral calls and losses on its securities lending portfolio were the two most significant causes of its collapse.

The portion of AIGFP's CDS portfolio that caused so much trouble for AIG was, as mentioned earlier, proportionally small. As of September 2008, AIG insured about \$360 billion of assets with CDS and only \$55 billion of that was on CDOs that contained subprime mortgage securities (Congressional Oversight Panel 2010, 24). It was these latter CDOs that caused most of the losses and, furthermore, these losses came from just 125 of AIGFP's approximately 44,000 derivative contracts. Indeed, as profitable as AIGFP was, it was never that big a

² Using AIG's AAA rating to generate low-cost funding seems to have been a strategy of AIG's. That was one of the reasons, for example, that AIG bought the aircraft leasing business ILFC (Boyd 2011, 66).

percentage of AIG's income. For example, the Congressional Oversight Panel (2010, 23) reports that in 2006, AIGFP provided only about 7 percent of AIG's operating income.³

To understand how AIG got to the point where a relatively small portion of the firm could bring the rest of it down, it is necessary to understand something about AIG's history and the dominating role played in it by Hank Greenberg.

AIG was a very unusual company. It was founded by Cornelius Vander Starr in Shanghai in 1919. Starr ran the company until he appointed Greenberg as his successor in 1968. Under Greenberg, the company grew dramatically.⁴ It expanded its insurance business and, in 1987, it entered capital markets through its joint venture with Sossin. It also had a very unusual long-term incentive scheme in which Greenberg would dole out shares of the Starr company—a byproduct of the corporate reorganization of AIG that he undertook when he first ran the company—that he also controlled, to loyal employees once they reached age 65. The promise of this long-term payout, which seems similar to the old investment banking partnership model, tied employees to AIG and gave them strong incentives to work hard and be loyal to the firm.

Boyd makes clear that much of the growth of AIG was due to the ambition and energy of Greenberg. The central role that Greenberg played in AIG is reflected in this description of Greenberg's management style (Boyd 2011, 132–3):

All people who discuss Greenberg and his tenure at AIG eventually mention the beehive of his office. People came and went, orders were delivered—often in under one minute—and more people flow in and more orders are laid out....It was common for a division chief, earning well into seven figures, to be sitting in a chair next to the CFO as Greenberg sat behind his desk on the phone listening to someone from Tokyo while carrying on (possibly) related conversations with the division chief and CFO. Often, these conversations were truly material as to corporate strategy and direction.

The picture that one gets of AIG is that it was a somewhat decentralized organization, with an entrepreneurial culture, but in which there was effective corporate oversight in the form of Greenberg. Boyd gives a story about how Greenberg watched positions that, for as large a company as AIG, are relatively small (Boyd 2011, 75):

³ The highest percentage it reached was about 12 percent in 2002.

⁴ Greenberg resigned as CEO in 2005. This means that over an 86-year period, the firm only had two leaders.

On many occasions, Davis and Rubin [two of the leaders of AIG Trading] had gotten called out of meetings, flagged down on vacations, interrupted in the middle of a big trade, and ordered to defend a certain position then on the books. The rub was that most every time it was the tail end of some big trade they were squaring away with a large customer and were in the process of selling. On a few occasions, they had made the mistake of attempting to reason with Greenberg, something to the effect of, “Hank, this is a \$5 million position in yen futures/gold forwards/natural gas options. It’s really liquid and pretty minimal in the scope of-”

[Greenberg replying] “Hedge it, reinsure it, or there are consequences.”

Boyd also writes (2011, 63):

But any analysis of AIG’s risk management begins and ends with Greenberg. Like a brilliant professor with a cluttered office, he knew where everything was and what it all meant. He was the risk management terminus, the ultimate arbiter of what was and was not acceptable. The problem was not that it didn’t work, but that it worked so well. A generation of AIG employees learned to measure the risk they took so that it would be congruent with what Hank would tolerate. Investors and analysts happily assumed that a system like that would be in place forever more.

It wouldn’t be.

Boyd’s view is that this dependence on Greenberg was AIG’s weakness. If he were to leave and a lesser mortal stepped in his place, the system would break down, and this is what he argues happened when Martin Sullivan replaced Greenberg.

One of the most extraordinary things about how AIG lost Greenberg was the way it happened. Despite Greenberg turning 80 years old in 2005, he did not become ill or simply decide to retire. Instead, he was forced to leave because of the actions of Eliot Spitzer, the politically ambitious New York attorney general.

In the aftermath of the Enron accounting scandals, the political environment had shifted toward more aggressive enforcement of accounting violations. Based on several reinsurance transactions in 2000 that were of a questionable accounting nature, Spitzer went after AIG hard. Boyd’s view is that Spitzer’s legal case was not that strong, that he aggressively used leaks to the media to frame public opinion at the expense of the rule of law, and that he was driven by his political ambitions. Regardless of the merits of Spitzer’s case, the end result was that Greenberg was forced out in February 2005 as head of AIG and replaced with Martin Sullivan. Partially because of the scandals, AIG

lost its coveted AAA rating. Furthermore, the attention of the Board of Directors and senior leadership was so focused on dealing with the legal risks from settlements with the attorney general and regulators that they were distracted from dealing with more traditional sources of risk.

It is after Greenberg left that AIGFP and Securities Lending made the decisions that got AIG into trouble. AIG kept writing CDS through the end of 2005 after Greenberg left in February of that year and even after AIG was downgraded from its AAA rating.⁵ Furthermore, the increase in risk taken by the securities lending program started in the winter of 2005, also after Greenberg had left. AIG's securities lending program took the investment-grade securities that its various insurance subsidiaries owned and then lent them out for cash collateral. They then took this cash and, rather than lend it against safe securities like short-term Treasury securities, they lent it against risky securities such as subprime mortgage-backed securities.⁶ Not only did the value of these securities drop, but they created liquidity risks because the cash lenders demanded their cash back and AIG was forced to sell these long-term securities precisely when mortgage markets were collapsing and becoming more illiquid.

Greenberg claims that once AIG was downgraded in early 2005, he would have stopped insuring the CDOs if he was still at the helm (Congressional Oversight Panel 2010, 27). Whether this is true is, of course, impossible to know. One distinction between the two regimes, however, is that under the Sullivan regime, there is evidence that AIG's senior management was unaware of the risks that AIGFP was actually taking. The collateral calls on AIG in the autumn of 2008 were based on contractual terms in annexes to the CDS contracts. Amazingly, corporate headquarters seems to have been unaware of the existence of these annexes (Boyd 2011, 325). This suggests that there were serious problems in AIG's controls and reporting systems. Indeed, the Congressional Oversight Panel (2010, 28) reports that AIG's auditor, PricewaterhouseCoopers, noted that in 2007 there were material weaknesses with the valuation of the CDS written by AIGFP on super senior CDO securities.

⁵ Not all of the CDO risk can be attributed to these latter CDS. The CDOs that AIGFP insured had a feature called dynamic asset management (Congressional Oversight Panel 2010, 24), which means there is a collateral manager who replaces collateral as it is paid off according to the CDOs investment rules. Consequently, CDOs insured prior to Greenberg's departure would still have picked up some of the worst vintages of subprime loans that were made in 2006 and 2007.

⁶ For example, in July 2007, one AIG unit discovered that 80 percent of its \$540 million investment was really backed by mortgage-backed securities that could be considered subprime (Boyd 2011, 248).

Boyd points out some other weaknesses in AIG's information systems, such as the inability to get up-to-date financial information for AIG's units (Boyd 2011, 174), that suggest this was a more pervasive problem. The picture that one gets of AIG as a company is that the management information systems had some big weaknesses, but Greenberg's instincts and deep knowledge of the company compensated for these gaps. When Greenberg was forced to leave, this knowledge was lost and his replacement, Sullivan, was left with a company that was so big and complex that it had hidden risks.

2. MERRILL LYNCH

From 2002 to September 2007, E. Stanley O'Neal was the CEO of Merrill Lynch. He was hired in 1987 and quickly rose through the ranks. He became president in 2001 and acted decisively to first manage the operations of the firm after the terrorist attacks of September 11, 2001, and then to greatly reduce staff that was no longer needed because of the end of the tech boom. Partly because of his performance in this period, he was promoted to CEO in 2002, forcing out the previous CEO, David Komansky.

O'Neal greatly changed Merrill Lynch in both its strategic focus and its culture. Historically, the strength and focus of Merrill Lynch was its vast network of financial advisers—"the thundering herd"—who gave financial advice to Main Street America. Until O'Neal, Merrill's CEOs had been promoted from this line of business.⁷ However, in the late 1990s, capital market and trading activities were growing relative to the financial advice business and were considered to be more promising. As CEO, O'Neal took this mandate and greatly expanded it.⁸ The other dramatic change that O'Neal made to Merrill Lynch was to end its paternalistic culture of taking care of its employees. This culture gave the firm the nickname "Mother Merrill" and it meant, in practice, that mediocre performers were sometimes protected. When O'Neal reduced

⁷ O'Neal actually ran wealth management for a short period of time before being promoted, but most of his career at Merrill was spent in other areas.

⁸ For reporting purposes, Merrill broke its activities into two lines of business. The formal names of these businesses change over time, but one line of business consists mainly of wealth management and the other consists of capital market activities, like trading, as well as investment banking services, e.g., merger and acquisition advice. In 1998, the wealth management business had net revenues of \$11.3 billion while the trading/investment banking line of business had net revenues of only \$6.5 billion. By 2006, the proportional importance of the two units had almost reversed. The wealth management business had net revenues of \$12.1 billion, while the trading/investment banking business, which includes the fixed-income, commodities, and currencies unit discussed later, had net revenues of \$18.9 billion. (Source: Merrill Lynch Annual Reports 1998, 2006.)

staff, he did so dramatically by laying off 22,000 people, or nearly 30 percent of the firm's employees.

Farrell's view is that in destroying this old culture, which he thinks did need to be replaced or at least altered, O'Neal destroyed some of the important checks on risk-taking that had existed at the firm. First, paternalistic cultures tend to be more risk averse. Second, as part of the layoffs, he eliminated many executives who were associated with the old regime or were a potential threat to him and replaced them with a younger, more diverse group that was loyal to him (Farrell 2010, 89). What arose in its place was a culture missing strong independent executives willing to challenge O'Neal on decisions. Farrell believes it was these conditions that allowed for the decisions that caused Merrill Lynch's problems.

Merrill Lynch's biggest problems came from its fixed-income, commodities, and currencies, or FICC, line of business. One part of this business was to underwrite, or create, CDOs. A CDO underwriter buys the fixed-income securities that go into the CDO and structures the securities.

By 2004, Merrill Lynch was the largest underwriter of CDOs (Barnett-Hart 2009). As the housing boom grew, the volume of CDOs grew and many of them included mortgages, particularly subprime ones. Like many of the other investment banks, Merrill Lynch bought a subprime originator, First Franklin, in 2006 to vertically integrate the supply of mortgages.

A significant risk for a CDO underwriting firm is that it will not be able to sell all the CDOs it creates or, if it can't even put the CDO together, the assets that it bought in the first place. This was what happened to Merrill Lynch. In late 2006 and the first half of 2007, as most everyone else was getting out of this business, they kept underwriting CDOs. In the first half of 2007, Merrill underwrote \$34 billion in CDOs, most of which ended up on its balance sheet because investors had stopped buying them (Farrell 2010, 18). Furthermore, these CDOs were backed by particularly risky collateral, namely, subprime loans made at the peak of the boom as well as risky tranches from other CDOs.

It was these positions that contributed the most to Merrill's troubles. At the end of the second quarter of 2007, before the write downs started, Merrill Lynch had a balance sheet of slightly over \$1 trillion, and, like the other investment banks, it was highly leveraged, so it only had equity capital of \$42 billion.⁹ Amazingly, these CDO holdings

⁹ Source: Merrill Lynch 10-Q, second quarter 2007.

performed so poorly that they lost most of their value over the next year, which wiped out much of this capital. (Merrill did raise capital over this period and had earnings in some other parts of the firm, which offset some of these losses.)¹⁰ As Farrell (2010, 34) puts it,

Merrill Lynch had just violated the cardinal rule of every financial institution on Wall Street, which holds that no one business unit should ever be given enough leeway to sink the entire firm.

To put this in perspective, in 2006 FICC's revenue net of interest expense was about \$7.5 billion, which was about 22 percent of Merrill's total revenue (Merrill Lynch 2007 annual report). Furthermore, FICC not only underwrote CDOs, but also traded in currencies, commodities, and other fixed-income securities, so the 22 percent upper bound is probably far from the actual amount.

Farrell ties this disastrous buildup in risk to the hiring decisions made by O'Neal and one of his chief lieutenants, Ahmass Fakahany. In 2006, when FICC was created as a separate unit within the trading group, the head of sales and trading, Dow Kim, had to decide who would head it. Kim's first choice was an internal candidate named Jeff Kronthal who had experience with mortgage-backed securities, understood risk, and had been at Merrill Lynch since 1989. Furthermore, he had recently become cautious about the real estate market (Farrell 2010, 24). Kim's second choice was Jack DiMaio, an outsider, who had run a hedge fund and, as a consequence of that experience, understood risk. Unfortunately, neither O'Neal nor Fakahany (to whom Kim reported) wanted Kronthal or DiMaio. Instead, they wanted Osman Semerci, whom they had pegged as a rising star at Merrill. Kim was reluctant to hire him because of his lack of experience in risk but did what his bosses wanted (Farrell 2010, 25).

Semerci's background was in sales. He started in Merrill in retail and moved to institutional sales and did very well at that. However, he did not have much experience with risk and Farrell describes his promotion, with some hyperbole, as "[taking a] salesman with the instinct of a riverboat gambler and making him general manager of the casino" (Farrell 2010, 25). One month after Semerci took over in July 2006, Kronthal, along with a group of experienced traders, was fired.

¹⁰ Merrill's 2007 and 2008 10-Ks give more details on FICC's losses. Over this two-year period, they wrote down their CDOs by \$26.9 billion, wrote down U.S. subprime mortgages by \$14.0 billion, adjusted the value of their hedges down by \$13.0 billion, and wrote down subprime securities by \$7.2 billion. The total was \$61.1 billion over this two-year period.

Ostensibly, the buildup of Merrill's CDO exposure was due to a bad hiring decision, but this would not be the first time a corporate CEO hired the wrong person for a job. What is particularly troubling is that outside of FICC, the rest of Merrill seemed unaware of the size of the CDO position. Farrell does not provide the details on what the risk management, accounting, and other control functions in the firm were measuring with respect to the CDOs, but several stories he reports suggest that these systems were lacking.

Particularly illuminating were the difficulties that several high-up executives faced in determining just how much CDO exposure FICC built up under Semerci. At a July 2007 board meeting, Laurence Tosi, who was the chief operating officer of global markets and investment banking (which FICC was part of), learned that FICC had accumulated \$31 billion of CDOs on its balance sheet, yet claimed they had minimal mortgage exposure. He was skeptical (Farrell 2010, 17–18) and tried to figure out just how much risk FICC really had (Farrell 2010, 16).¹¹ Furthermore, at about the same time a former risk executive named John Breit started his own attempt to figure out the true exposure after hearing about it from some junior quantitative analysts at a conference. Farrell describes the difficulties they faced in tracking down the exposures, mainly because the information was tightly controlled by Semerci and his staff was afraid of talk to non-FICC staff about these matters.

Farrell puts the positions that Semerci built up as the proximate cause of Merrill's failure and he believes that O'Neal did not realize how much CDO exposure was building up.¹² Nevertheless, he blames O'Neal and Fakahany for Merrill's troubles because they pushed for Semerci's promotion and, more importantly, O'Neal fostered a culture that eviscerated some of the checks that existed under the old Mother Merrill culture, which might have prevented Semerci's promotion and him from building up the large CDO exposure.

¹¹ Some of FICC's risk would not have shown up in accounting numbers because it was hedged. In order to sell AAA CDO securities, Merrill had traditionally bought protection from AIGFP that made the securities more appealing to investors. However, AIG stopped providing this service on subprime-backed securities in late 2005. Consequently, by 2007 Merrill was holding on to the AAA portions and hedged them by buying insurance from the monoline insurers. The monoline insurers were pretty thinly capitalized, and, given the nature of their business, couldn't really provide much insurance against big aggregate shocks, so these hedges were not that useful and later were written down in value.

¹² McLean and Nocera (2010) also believe that O'Neal was unaware of the size of the exposure. Furthermore, they think Kim, who left Merrill in May 2007, was unaware of it as well (McLean and Nocera 2010, 314).

3. SPAN OF CONTROL AND TOO BIG TO MANAGE

Despite AIG being primarily an insurance company and Merrill Lynch being primarily an investment bank, they had several features in common. First, both were very large and complex. At the end of 2006, AIG had \$979 billion in assets, and Merrill had \$841 billion in assets. Second, both were highly leveraged. At the end of 2006, AIG's leverage ratio was nearly 10, while Merrill's was nearly 22. Third, both got into trouble mainly from the actions of one or two units within their firm. Fourth, and this is the major thesis of the authors, neither firm's CEO had a good system in place for preventing the buildup of risk, or even recognizing it, in portions of their firm.

In the span of control model used in economics to study the size of firms (e.g., Lucas [1978]), managers differ in their ability to manage people and other resources. The more capable the manager is, the more people and activities he can effectively manage. If the market allocates resources to managers efficiently, then each manager or CEO of a firm gets the right amount of inputs. But if for some reason the market does not do this efficiently, then the CEO and his management team get the wrong amount.¹³

What seemed to happen in the case of Merrill and AIG is that they got too much capital and became too large to effectively manage. In AIG's case, the "system" for controlling risk was so dependent on Hank Greenberg that when he was forced to leave, it stopped working. His successors were left with a very large, complex organization in which a proportionally small but complex part was able to take enough risk to sink the organization. Similarly, while the Merrill collapse looks to be due to a bad hiring decision, it should not be forgotten that Merrill was a \$1 trillion firm, and there was a lot more going on than just the CDO underwriting activities of FICC. For a firm of that size, a \$30 billion exposure is a relatively small percentage of the balance sheet. The fatal mistake was to develop a corporate culture that did not recognize how risky that line of business could be and then allowing a risk-taker to run it.

There are other examples where the failure of one small part of a financial firm caused it to fail. One such famous case was the failure of Barings Bank in 1995. Barings failed because a single trader named Nick Leeson was able to use his control over back office functions to hide enormous bets that he took on the Japanese and Singaporean exchanges—bets that ultimately failed (Kuprianov 1995).

¹³ The Appendix contains a span of control model where too-big-to-fail policies lead financial firms to become inefficiently big.

The lack of a proper control environment at Barings is an example of a management failure, though by recent standards Barings was neither a particularly large nor a particularly complicated firm. However, one bank whose troubles can be tied to growing too large was UBS. UBS made a strategic decision to expand its fixed-income business in 2005 near the end of the mortgage boom. However, as the UBS Shareholder's report (2008) documents, pricing of internal funding encouraged the accumulation of AAA-related CDO positions. One division would originate these CDOs and another division would buy them. Risk measurement did not fully pick up exposures, partly because they relied on the ratings, but also because information systems reported net (inclusive of hedges that turned out to be too small or not very good) rather than gross exposures.¹⁴ The report concludes that senior management did not intend to take a lot of risk, but instead were unaware of how much risk the bank was really exposed to. Partly because of these losses, UBS was later bailed out by the Swiss National Bank.

Where the two books have a limitation is that there is a lack of detail about the risk management and other information systems used by the two companies. There are bits and pieces of evidence that suggest neither firm's systems were up to the task, but what could really cement this conclusion would be an in-depth analysis by someone with unfettered access to insiders and management reporting systems, like was done by UBS.¹⁵ Then we would have a better sense of how much of the risk that was taken was due to inadequate measurement systems, how much was due to conscious risk-taking, and how much was just bad luck. Both authors had to work with what they could determine from public sources, as well as whoever was willing to talk with them, often off the record, so this criticism is not directed at them.

While these weaknesses in internal risk management and management information systems are important to investigate, it needs to be recognized that any system will eventually fail. What the AIG, Merrill Lynch, and UBS cases demonstrate is that diversification does not

¹⁴ The poor quality of internal information seems to have been a problem at numerous large financial firms during this crisis. Kirsten Grind's book *The Lost Bank: The Story of Washington Mutual* details the rise and fall of this huge West Coast thrift. She reports that in its rapid accumulation of other banks and thrifts, Washington Mutual, by 2004, ended up with 12 different mortgage information systems and did not consolidate them, partially because its mortgage business was doing so well (Grind 2012, 99). Furthermore, when the market started to turn, the lack of attention to integrating data systems made it difficult for Washington Mutual to track the characteristics of its mortgage portfolio (Grind 2012, 165). So much for technological economies of scale in banking!

¹⁵ The Congressional Oversight Panel (2010) report has some information along these lines for AIG.

always reduce risk for a financial firm. As the scope of a firm's activities grow, these activities become harder to evaluate and control. If losses from a particular activity can be large enough to sink the firm and the other activities of the firm can't function on their own, then failure of a single part of a firm can be disastrous. For financial firms that are highly leveraged and dependent on short-term debt, mistakes by management make this possibility even more likely. If a firm is involved in too many activities, then more diversification is really less.

4. TOO BIG TO FAIL AND TOO BIG TO MANAGE

So what might have led these two firms (and others) to get so large and complicated? Why might they have grown to exceed their managers' span of control? Some of it was certainly the housing boom. Most financial institutions did well in this period, so it was easy to grow. Nevertheless, another important factor at work, which neither author discusses, is that both firms were large enough that they could reasonably be considered to be too big to fail. This meant that their creditors could monitor them less carefully and charge less to lend to them. As a consequence, both firms could get larger and more complex than they would have otherwise. Indeed, Greenberg's strategy was to use the funding advantage that came with AIG's AAA rating to fund AIGFP's positions at a lower cost than its competitors, and that is one reason this unit, and others, could enter into so many transactions and grow.

The defining characteristic of U.S. financial regulatory actions over the last 40 years has been to intervene to prevent failures of large financial firms and to bail out short-term creditors of banks. The origins of this policy can be found in Sprague (1986), who describes a succession of bailouts made by the Federal Deposit Insurance Corporation (FDIC) from the early 1970s through the mid-1980s.¹⁶ The first large one was Bank of Commonwealth, a \$1.2 billion bank in Detroit. The next large one was of First Pennsylvania in 1980, a \$9 billion bank that made a disastrous interest rate bet.¹⁷ Finally, in 1984 there was the big bailout at the time, Continental Illinois, which is when the term "too big to fail" spread widely in public discourse.

¹⁶ For an excellent book on too big to fail, see Stern and Feldman (2009).

¹⁷ A large bank that was almost bailed out in 1983 was Seafirst, a \$9 billion bank in Seattle that was heavily exposed to Penn Square, a bank that failed in 1982. Sprague (1986) reports that a \$250 million loan from the FDIC was prepared and ready to be made in case Seafirst could not find a buyer. Fortunately for the FDIC, Bank of America bought the bank at the last minute.

Continental Illinois was a \$30 billion bank that was mainly funded by uninsured deposits in the wholesale market. Furthermore, it had an extensive network of correspondents and counterparties. When Continental Illinois got into trouble, its wholesale lenders started pulling their money out. Bank regulators were so worried about the contagion effects of its failure that the Federal Reserve made extensive discount window loans that allowed uninsured depositors to withdraw their money and the FDIC took partial ownership.

As Hetzel (1991, 2012) documents, Continental Illinois was not the only bank for which Federal Reserve discount window lending was used to prevent a sudden failure. It was also used in the periods leading up to the failures of Franklin National in 1974 and the National Bank of Washington in 1990 and, in both cases, the emergency lending gave uninsured depositors time to get much of their money out of the bank before it failed. While there are exceptions, in general uninsured depositors rarely lose money in a bank failure.

While any doubts about whether nonbank financial firms like AIG or Merrill Lynch were too big to fail were erased by the financial crisis, what did creditors think before the crisis when these firms were growing? Did they think that they would they receive the same treatment as a bank in trouble? Based on the precedents discussed above, there are good reasons to think that they would have. Merrill Lynch funded its holdings of mortgage-backed securities by using short-term repo markets, which are essentially short-term loans and a bit like deposits. Failure in the repo market would be very disruptive. AIG's credit default swaps were held by many counterparties and some of them might have failed if AIG had failed, much like many correspondents and other banks might have failed if Continental Illinois had failed. Finally, there are precedents for financial regulators to intervene at nonbank financial firms and in financial markets. For example, when the hedge fund Long-Term Capital Management failed in 1998, the New York Fed put its creditors together—mainly the large commercial banks and investment banks—so that they would agree to put capital into the fund and avoid rapidly liquidating its assets. In 1987, when the stock market dramatically dropped, many broker-dealers were close to failing, but regulators pressured banks to lend to them to keep them functioning.¹⁸

It is well recognized that the safety net can encourage risk-taking, as in the infamous “gambling for resurrection” that some of the savings

¹⁸ An extremely high fraction of financial liabilities are explicitly or implicitly backed by the federal government. Marshall, Pellerin, and Walter (2013) estimate that, as of the end of 2011, 57 percent of financial liabilities in the United States are explicitly or implicitly backed by the federal government.

and loans engaged in during the 1980s (see White [1991]). Sprague's description of how both Bank of Commonwealth and First Pennsylvania bought long-term securities, betting that interest rates would fall (but instead rose), seems to fit this description (Sprague 1986, 86).

But there is a second, indirect way in which the safety net encourages risk. Both AIG and Merrill Lynch seemed to have gotten too big and complicated for what their management could handle.¹⁹ Now, in a sense, these two mechanisms are one and the same. After all, consciously becoming large and complicated is a way to become riskier, but knowingly taking a risky bet seems to have some differences from stumbling into a risky bet. My reading of the books is that both authors believe that the CEOs were unaware of just how much risk their firms were exposed to. They were too removed from the activities on the ground to understand the risks, while the enormous profits of the mortgage boom years masked some of the signals that might have warned them earlier about what was really going on.

5. CONCLUSION

Both books contain many other interesting insights into AIG, Merrill Lynch, other firms, and financial markets. Boyd's description of the history of AIG, with its international origins and Greenberg's connections to world leaders, makes one wonder about the political economy of the insurance business, while AIG's use of shares in Starr as a long-term incentive is worth knowing more about, particularly with the move in bank regulation toward pushing banks to use more deferred compensation. Similarly, Farrell describes the unusually powerful role played at Bank of America by its human resources department and, as a former financial reporter (he used to work for the *Financial Times*), he has special insight into how information makes its way to the public. For example, he makes it quite clear that executives at large financial firms are just as willing as Washington officials to strategically leak information to reporters.

While reading the books, the emphasis on Greenberg and O'Neal makes it tempting to look at the failure of both firms solely as failures of their CEOs. But behind both stories are really two important themes that transcend any individual. The first is that 40 years of bailing out financial firms and short-term creditors led us to the point where some financial firms are encouraged to get too leveraged, too complex, and

¹⁹ For a description of the traditional risk-shifting model used to study bank risk-taking, see Prescott (2001). For a simple model of an alternative way in which the safety net increases risk, and which is along the lines of this review, see the Appendix.

too big for their own, or anyone else's, good. The second theme is that there are plenty of financial activities that can develop large exposures to risk and, when one of these fails, the losses can be so large that they are catastrophic and bring down the rest of the firm.

Where the two books excel is that they demonstrate how dangerous a bad decision can be in a large, leveraged, complex financial firm. A managerial mistake, either intentional or unintentional, can bring down a financial firm. If the firm is small, then such a mistake will likely cause failure, but the consequences won't be that severe. Put all of these activities into one firm and the same mistake will be less likely to cause a failure, but if a big enough mistake happens, the consequences will be a whole lot worse.

APPENDIX

This appendix works through a basic span of control model that formalizes the idea expressed in this review that large financial firms can get so large that they are riskier than is socially optimal. The model is a version of Lucas (1978) in which managers of varying talent levels manage capital.²⁰ The model can be used to characterize industries in which the size distribution is skewed to the right, that is, there are a few large firms and lots of small firms, which is the pattern in many industries and increasingly so in financial intermediation. The better a manager is, the more capital he manages. However, we add government bailouts that lower the cost of capital to large banks. As a consequence, the most talented managers manage a bigger bank than is socially optimal.

There is a cumulative distribution function, $H(t)$, of individuals with managerial talent t . An individual may either be a manager or a worker. A manager rents capital, k , and tries to produce output.²¹ A manager is successful with probability $f(t, k)$. If successful, he produces $tg(k)$, and if he is not successful, he produces zero. We assume that $g(k)$ is increasing and concave in k and that $f(t, k)$ is linear and decreasing

²⁰ The model is also related to Ennis and Malek (2005), who develop a model of a large number of ex ante identical banks, each of which chooses its size and risk. Deposit insurance and too-big-to-fail policies encourage each bank to get inefficiently large and take on an inefficiently high amount of risk.

²¹ Capital here is simply the funds invested in the firm. To keep the model simple, all the invested funds are treated like debt.

in k . The linearity is a strong assumption, but greatly facilitates the analysis. We also assume that $f(t, k)g(k)$ is increasing and concave in k for the range of capital relevant for this problem. This assumption ensures that the banks are in the region of capital where getting bigger still increases expected revenue.

The rental rate on capital equals its expected return; its risk-free rental rate is r . If an individual becomes a worker, his income is w . Both w and r are exogenous. Finally, each individual maximizes his expected income.

We model too-big-to-fail banks by assuming that if one of these banks fails, the owners of its capital are repaid their principal and still receive their interest. For simplicity, we assume that all banks with managerial talent $t \geq t^b$ are too big to fail, which means they only have to pay out the risk-free rate, r , when they are successful.²² We also assume that all people with talent $t \geq t^b$ find it worthwhile to be managers; this way there will be banks that are not too big to fail and others that are. The decision for too-big-to-fail managers is how much capital to rent. They solve

$$\max_k f(t, k)(tg(k) - rk).$$

A linear equation times a concave function is concave, so this equation is concave and the first-order condition is necessary and sufficient for characterizing an optimum. It is

$$f_2(t, k)tg(k) + f(t, k)tg'(k) = f_2(t, k)rk + f(t, k)r. \quad (1)$$

For a manager who is not too big to fail, that is, $t < t^b$, the interest rate that he pays is $r/f(t, k)$, which reflects the probability that the owners of the capital might not get it back. His objective function is

$$\max_k f(t, k)tg(k) - rk.$$

The first-order condition is

$$f_2(t, k)tg(k) + f(t, k)tg'(k) = r. \quad (2)$$

Let $k^*(t)$ be the optimal amount of rental capital for a $t < t^b$ individual. A person with this level of talent will be a manager if

$$f(t, k^*(t))tg(k^*(t)) - rk^*(t) \geq w.$$

It is straightforward to show that $\frac{\partial k^*(t)}{\partial t} > 0$ and that a manager's profits are increasing in t . Therefore, there is a marginal manager, t^z ,

²² The more natural alternative is to make the too-big-to-fail cutoff depend on the amount of capital a bank manages, but that complicates the analysis because it creates a discrete choice for some banks of whether to exceed the too-big-to-fail threshold.

who is indifferent between being a worker and a manager. People sort into jobs according to the following rule

$$\begin{aligned} t < t^z &\rightarrow \text{workers} \\ t^z \leq t < t^b &\rightarrow \text{manages a bank that can fail} \\ t \geq t^b &\rightarrow \text{manages a too-big-to-fail bank.} \end{aligned}$$

The distortion in this economy is that capital for too-big-to-fail banks is subsidized. Not surprisingly, this means that these banks get inefficiently large. To see this, compare (1) with (2) for a fixed level of k . The former equation characterizes the amount of capital chosen by a bank with the too-big-to-fail subsidy, and the second equation characterizes the capital without the subsidy. The left-hand side of these two equations are identical and, by assumption, decreasing in k . Furthermore, comparing the right-hand sides of these two equations, observe that $f_2(t, k)rk + f(t, k)r < r$. Consequently, a k that satisfies (1) is more than a k that satisfies (2).

Too-big-to-fail banks are inefficiently big, and they fail more often than they would without the subsidy. Interestingly, in the debate about the quantitative effects of too big to fail, the spread in interest rates of bonds between the largest banks and small (but still large) banks is sometimes used to measure the size of the subsidy. In this model, this spread does not measure the subsidy, since the subsidy is the difference in the interest rate that would have been paid by the too-big-to-fail bank if it could fail and the risk-free rate. Furthermore, in the absence of the subsidy, the too-big-to-fail bank would be smaller, fail less frequently, and be more productive. Measuring the interest spread does not measure these effects either.

Decisions by managers with $t^z \leq t < t^b$ are not affected by the subsidy. Neither the size of a non-too-big-to-fail bank is affected nor who is the marginal manager because r and w are exogenous. This would not be true if r and w were endogenous.²³

In this model, one solution to the distortion is a tax on firm size, or in a more general model, a tax on the insured liabilities of the too-big-to-fail banks. One proposal discussed in policy circles for getting rid of too big to fail is to cap bank size. In this model, that would mean capping the banks to the size corresponding to the largest non-too-big-to-fail bank. This would, of course, eliminate too big to fail, but as this model makes clear, it would do so at a cost, possibly a substantial one. In particular, the most productive banks—the ones run by the high

²³ In all likelihood, the general equilibrium effects need not be trivial. The subsidized capital moves capital through the banking system, which could lead to overinvestment. This in turn would affect the capital-labor ratio and, thus, r and w .

talent managers—would be artificially small, thus reducing banking sector productivity.

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