



Follow the Money: Compensation, Risk, and the Financial Crisis

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INTRODUCTION

It is commonly accepted by “Main Street” that Wall Street bankers contributed to—if not caused outright—the financial crisis of 2008 by making large, leveraged bets on the housing market, and that they were motivated to do so because of the large bonuses they stood to receive if successful. To this end, a 2009 survey by KPMG finds that 52 percent of senior managers at large financial institutions believed that “incentives and remuneration” were most at fault in contributing to the credit crisis—the highest of any attribute surveyed; 46 percent of respondents reported that they were planning to review compensation policies in the wake of the crisis.¹ Similarly, a 2009 PricewaterhouseCoopers survey of financial services professionals finds that the three most frequently cited factors that created the conditions for the crisis were a “culture and excessive risk-taking” (73 percent), “mispricing of risk” (73 percent), and “rewards systems” (70 percent).²

This line of reasoning has also been put forth by prominent economists and policymakers. According to former Federal Reserve Chairman Ben Bernanke, “Compensation practices at some banking organizations have led to misaligned incentives and excess risk-taking, contributing to bank losses and financial instability.”³ In Congressional testimony, former Treasury Secretary Timothy Geithner argued that, “Although many things caused this crisis, what happened to compensation and incentives in creative risk-taking did contribute in some institutions to the vulnerability that we saw in this financial crisis.”⁴ And economist and former Federal Reserve Vice Chairman Alan Blinder blamed the crisis on “the perverse incentives built into the compensation plans of many financial firms, incentives that

encourage excessive risk-taking with other people’s money.”⁵

How does compensation relate to and potentially dictate organizational risk? What is an “excessive” risk and how is it distinguished from an acceptable risk? Did the structure of executive compensation contribute to the financial crisis? The answers to these questions are valuable to policymakers as they consider the means for preventing future crises and to the directors of both bank and nonbank corporations as they consider how to design compensation contracts that encourage appropriate but not excessive risk-taking among employees.

RISK AND COMPENSATION

Risk refers to the potential for loss due to a negative outcome from an uncontrollable event. All corporate activities—strategy, operations, investment—involve risk because their outcomes are uncertain. For example, it is not practical to expect a financial institution to eliminate all risk because in order to do so it would have to invest entirely in government securities, guaranteeing a “risk-free” rate of return that is below its cost of capital. Rather than eliminate risk entirely, each company must decide how much risk it is willing to assume given its expertise (its *risk tolerance*). Once established, the board devises a compensation program that provides incentive to management to pursue corporate objectives in a manner consistent with this view of risk. In this way, compensation not only encourages performance but influences the manner in which financial results are achieved.

Public commentators and governmental regulators often pay considerable attention to the incentives provided by an executive’s annual

compensation (typically referred to as *flow pay*). This includes the size of the current year's overall pay package, the mix of cash and equity, the performance measures that awards are contingent upon (e.g., return-on-equity targets), and the time horizon over which they vest or are earned.⁶ The executive's appetite for risk and the time horizon that he or she considers in making decisions will be influenced by the types of awards the board offers and the conditions under which they are earned.

However, an analysis of executive compensation that focuses *exclusively* on annual flow pay is incomplete because it fails to take into account the fact that executives also have a large portfolio of personal wealth invested in the company. Many CEOs, particularly those who have been in their position for a number of years, accumulate a substantial investment in their companies by retaining vested equity awards or by buying shares in their company.⁷ Over time, the incentive value of this portfolio will begin to dominate the incentives provided by flow pay. In other words, executives will consider how their decision making potentially affects their *total wealth* rather than just one year's pay. This is true of the CEOs of major banks, who hold considerable amounts of company stock and options—both in absolute terms and in relation to their annual salaries. For example, in 2006 (prior to the financial crisis), the average CEO of a bank included in the S&P 1500 Index was paid \$5.8 million but held \$106 million of stock and options.⁸

So how does this portfolio of stock and options influence risk taking? It depends on the composition. An executive whose wealth consists entirely of *direct stock investments*—either restricted shares or shares that have vested but not been sold—stands to gain or lose wealth dollar-for-dollar with changes in the stock price (measured by *delta*).⁹ Many boards like this arrangement because it is seen as putting the executive on equal footing with the average investor. However, this is not entirely the case because the average investor holds shares as part of a diversified portfolio, while the risk-averse executive typically has a large, concentrated exposure to a single stock. Concentrated exposure to a single stock exposes executives to greater risk than is experienced by diversified shareholders. Researchers

have shown that executives might decline to pursue new projects that would otherwise be valuable to well-diversified shareholders (i.e., projects with positive net present value) because they have more at stake in the event of a loss than those shareholders.¹⁰ The executive's risk tolerance becomes much lower than that of shareholders, and over time, this can reduce performance.

Stock options can be used to address this problem. The intrinsic value of stock options is a non-linear function of share price. The value moves dollar-for-dollar with stock price when the option is “in the money” (when stock price is above exercise price) but the value is unaffected by stock price when the option is “out of the money” (when the stock price is below the exercise price). In other words, as stock price falls below the exercise price the executive is protected on the downside, but as stock price rises above the exercise price the executive has unlimited potential upside. This introduces “convexity” into the executive's potential payoff and encourages risk taking. Stock options tie the value of executive wealth to changes in stock price *volatility* (measured by *vega*).¹¹ As such, stock options can be an effective tool to encourage managers to become less risk-averse by investing in higher risk, higher return investments. Research shows that executives understand that the expected value of a stock option increases with the volatility of the stock price and that executives tend to respond to stock option awards by investing in riskier projects. For example, Coles, Daniel, and Naveen (2006) find that executives with large stock option exposure (high *vega*) spend more money on research and development, reduce firm diversification, and increase firm leverage—all actions that increase the risk profile of the firm.¹² In the banking industry, Mehran and Rosenberg (2007) find that large stock option exposure is positively correlated with firm risk, measured by asset and equity volatility.¹³

What incentives did the CEOs of financial institutions have to take risk prior to the financial crisis? Exhibit 1 shows the *vega* of CEO wealth over the 18 year period 1992 to 2009. It shows that equity-based risk-taking incentives were consistently higher among banks than nonbank corporations, and consistently *highest* among the subset of banks

that originated and distributed securitized assets.¹⁴ Notably, there is a dramatic increase in risk-taking incentives in 2000 following deregulation of the banking industry and the repeal of Glass-Steagall (which paved the way for an aggressive expansion of banks' securitization activity).¹⁵ By 2006, the *vega* of the average securitizing bank CEO was *fifteen-fold* higher than it had been in 1992 and quadruple that of the average nonbank CEO. Thus the incentives that bankers had to take risk not only increased but increased *substantially* in the years preceding the crisis, subsequent to the repeal of Glass-Steagall.

Because equity-based incentives are positively correlated with corporate risk, the immediate question for the board of directors is whether these incentives induce "excessive" risk taking. Unfortunately, no standard litmus test exists to distinguish an excessive risk from acceptable risk. An excessive risk might be one whose downside is so large that the firm cannot financially bear it.¹⁶

To this end, much public attention has been paid to whether certain corporations are "too big to fail," meaning that the government and taxpayers bear the downside and not just the firm's shareholders. In this situation, "excessive" risk taking from the view point of regulators might be different from that of the board and shareholders.

WHY THIS MATTERS

1. Compensation committees put considerable effort into designing CEO pay packages that encourage performance and tie compensation to results. How well do boards understand the relation between compensation and risk?
2. Shareholders and the public are intensely focused on the issue of CEO pay. However, the size and composition of CEO's equity wealth is often a greater source of incentive than annual flow pay. How much attention do directors pay to the risk-taking incentives provided by CEO wealth? Do boards evaluate the relation between the CEO's personal risk incentives and the overall risk tolerance of the firm?
3. A long list of regulations have been enacted or proposed to reshape the banking industry following the crisis. However, a simple solution might be for directors to lower the risk-taking

incentives they provide to CEOs by replacing stock option grants with direct equity awards. How much risk should bank executives be encouraged to take?

4. One approach to reducing risk in the banking industry is for regulators to monitor the riskiness of bank assets and restrict the amount of leverage that banks can take (e.g., through stress tests or fixed limits on leverage). Another approach is for boards to restructure compensation contracts to reduce the incentives that executives have to take risk in the first place. What are the advantages to regulatory oversight of bank activity, versus changes to the incentive structure? If regulators monitor bank activity but the incentives for risk-taking are still present, will managers find new ways to "game the system?" ■

¹ KPMG, "Never Again? Risk Management in Banking beyond the Credit Crisis" (2009).

² PricewaterhouseCoopers and Economist Intelligence Unit, "Reward: A New Paradigm?" (September 2008).

³ Cited in: Federal Reserve Press Release (October 22, 2009).

⁴ Timothy Geithner, "Testimony to Senate Appropriations Subcommittee on the Treasury Department's Budget Request," *Reuters* (June 6, 2009).

⁵ Edited lightly for clarity. Alan S. Blinder, "Crazy Compensation and the Crisis," *The Wall Street Journal* (May 28, 2009).

⁶ This information is easy to observe because it is included in public filings (form DEF 14A with the SEC) and often summarized by business reporters and consulting firms.

⁷ Furthermore, many companies adopt equity ownership guidelines that require executives to own a minimum amount of company stock. According to Equilar, approximately 84 percent of large companies currently have such guidelines. While ownership requirements vary significantly across companies, a typical plan requires the CEO to hold approximately five times his or her annual salary in equity, demonstrating the great extent to which equity ownership dwarfs flow pay among most companies. See: Equilar, "Executive Stock Ownership Guidelines" (2013).

⁸ Data provided by Standard and Poor's ExecuComp. "Banks" refers to bank holding companies that file Call reports with the Federal Reserve and appear on Standard & Poor's ExecuComp (i.e. appear on the S&P 1500). CEO pay is comprised of salary, bonus, total value of restricted stock granted that year, total value of options granted that year, long-term incentive payouts, and "all other compensation" listed in the firm's Summary Compensation Table. Value of equity securities calculated according to Core and Guay (2002). See John E. Core and Wayne R. Guay, "Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility," *Journal of Accounting Research* (2002).

⁹ *Delta* is calculated as the ratio of the change in expected value of the executive's total portfolio to the change in underlying share price, and is conventionally reported using a 1 percent change in stock price.

¹⁰ See Clifford W. Smith and René M. Stulz, "The Determinants of Firms' Hedging Policies," *Journal of Financial and Quantitative Analysis* (1985); Richard A. Lambert, David F. Larcker, and Robert

E. Verrecchia, "Portfolio Considerations in Valuing Executive Compensation," *Journal of Accounting Research* (1991); and Stephen A. Ross, "Compensation, Incentives, and the Duality of Risk Aversion and Riskiness," *Journal of Finance* (2004).

¹¹ *Vega* is calculated as the ratio of the change in expected value of the executive's total portfolio to the change in volatility of the underlying share price, and is conventionally reported using a change in standard deviation of 0.01.

¹² Jeff L. Coles, Naveen D. Daniel, and Lalitha Naveen, "Managerial Incentives and Risk-Taking," *Journal of Financial Economics* (2006). See also: Christopher S. Armstrong, David F. Larcker, Gaizka Ormazabal, and Daniel J. Taylor, "The Relation between Equity Incentives and Misreporting: The Role of Risk-taking Incentives," *Journal of Financial Economics* (2013).

¹³ Hamid Mehran and Joshua Rosenberg, "The Effect of CEO Stock Options on Bank Investment Choices, Borrowing, and Capital," Federal Reserve Bank of New York Staff Report No. 305 (October 2007, revised June 2008).

¹⁴ During the financial crisis the risk of the entire banking sector increased. It turns out that this sector-wide increase in risk coincided with a massive sector-wide increase in risk-taking incentives. This increase was particularly pronounced among banks that were participating in the securitization process. Prior research suggests that the increasingly common practice of securitizing loans led to a deterioration in loan quality and was at the heart of the financial crisis. A large increase in risk-taking incentives among securitizing banks could potentially explain the deterioration in loan quality at these banks. See: Benjamin J. Keys, Tanmoy Mukherjee, Amit Seru, and Vikrant Vig, "Did Securitization Lead to Lax Screening: Evidence from Subprime Loans," *Quarterly Journal of Economics* (2010).; Benjamin J. Keys, Amit Seru, and Vikrant Vig, "Lender Screening and the Role of Securitization: Evidence from Prime and Subprime Mortgage Markets," *Review of Financial Studies* (2012); and Atif Mian and Amir Sufi, "The Consequences of Mortgage Credit Expansion: Evidence from the US Mortgage Default Crisis," *The Quarterly Journal of Economics* (2009).

¹⁵ In November 1999, the Gramm-Leach-Bliley Financial Modernization Act repealed Section 20 of the Glass-Steagall Act. Prior research argues that deregulation of the banking industry led to a more competitive environment, demand for talent, and an increase in equity- and option-based compensation. See R. Glenn Hubbard and Darius Palia, "Executive Pay and Performance: Evidence from the U.S. Banking Industry," *Journal of Financial Economics* (1995).

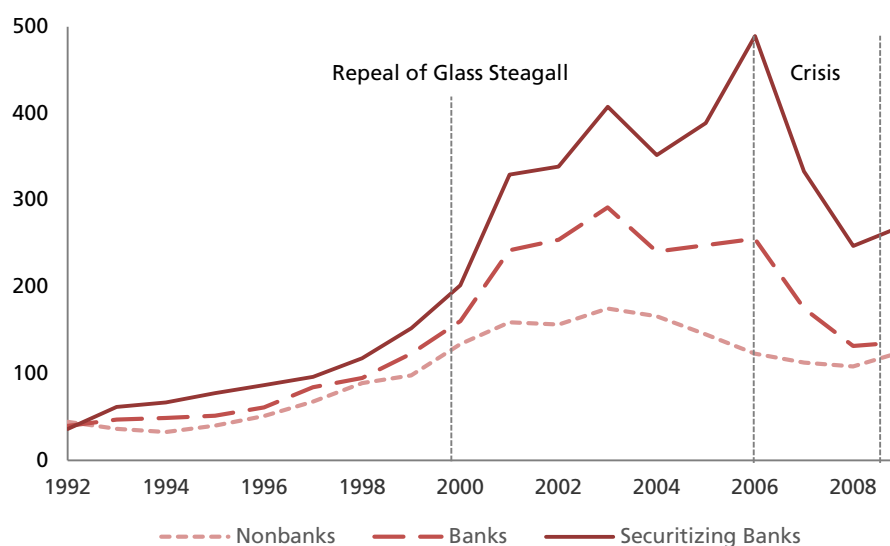
¹⁶ Risk is measured by the probability of gain/loss *prior* to an event taking place. A negative outcome does not tell us that an activity was highly risky any more than a positive outcome tells us that an activity was not risky. Still, the inability of the financial services industry to absorb the losses it incurred certainly suggests that risk taking was excessive in hindsight.

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EXHIBIT 1 — RISK-TAKING INCENTIVES PRIOR TO THE FINANCIAL CRISIS

Note: Plot of average portfolio vega by year for all CEOs on ExecuComp with non-missing data. Portfolio vega (in thousands) is calculated as the sensitivity of the CEO's equity portfolio to a 0.01 change in stock volatility per Core and Guay (2002) and is expressed in units of \$1,000. The term "Banks" refers to bank holding companies (132 unique banks), "Securitizing Banks" refers to "Banks" with at least six quarters of non-zero securitized assets (58 unique banks), and "Nonbanks" refers to all other firms (3,232 unique firms). Section 20 of the Glass-Steagall Act was repealed by the Gramm-Leach-Bliley Financial Modernization Act in November 1999; effective March 2000, bank holding companies were allowed to expand the issuance of asset-backed securities.

Source: Data from ExecuComp. Calculations by the authors.