

SPRING 2016



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In May 2012, Wells Fargo Advisors awarded a gift to Washington University in St. Louis to support Olin Business School. Olin's newly named Wells Fargo Advisors Center for Finance and Accounting Research (WFA-CFAR) will be a catalyst for enhancing finance and accounting research and education, which benefits faculty members, students, and businesses. To that end, initiatives housed under the WFA-CFAR umbrella include:

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To obtain copies of the original research papers summarized here or recommend your company for a future research project, please contact Marcianne Gagliardi, Wells Fargo Advisors Center for Finance and Accounting Research program manager, at mgagliardi@wustl.edu or 314-935-2943.



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A Message from the Director

I am pleased to continue our magazine, *SEE FAR*. Apart from the obvious attempt to “capitalize” on the WFA-CFAR name, the name also captures the essence of our research: looking to the future rather than concentrating exclusively on current events and thinking, and focusing on big-picture issues that have far-reaching consequences.

All the articles in *SEE FAR* are based on finance and accounting research that has been previously published in an academic journal or as a monograph, or is currently a working paper that will be published in the future. The original papers have been rewritten as executive summaries for *SEE FAR* so that they are accessible to a broad audience, rather than solely to those in academia. This is no small task. Taking a paper originally written for a highly technical academic audience and converting it into something more accessible takes a great deal of skill and hard work, as we discovered while putting together this issue and our first issue. But perhaps that is why the task is so worthwhile. I firmly believe that this will not only help us build a bridge between the research of Olin Business School faculty and those in the world of practice, but also will add to the knowledge people use on a daily basis. The intellectual capital generated by our faculty members’ research is quite impressive—Olin consistently ranks among the top 10 schools in terms of our research output. For this reason, it is important that WFA-CFAR research is made available to as many of our stakeholders as possible.

I hope that you enjoy reading the summaries in this issue. I would like to thank my faculty colleagues who participated in helping us create this issue by providing their papers and working with us to convert them into what you will read on the following pages. I would also like to thank Rosit Rosenboim for her hard work in helping bring this issue to fruition.

I look forward to any feedback you have to help us improve this magazine. Please contact WFA-CFAR Program Manager Marcianne Gagliardi at mgagliardi@wustl.edu with your insights.

Sincerely yours,

A handwritten signature in dark ink, appearing to read 'Anjan Thakor'.

Anjan Thakor

John E. Simon Professor of Finance, Director of Doctoral Programs, Director of the WFA Center for Finance and Accounting Research, Olin School of Business, Washington University in St. Louis



Paper: "Tail-Risk Perspectives"

Author: Stuart Greenbaum, Washington University in St. Louis

Publication: *The Journal of Investing*, 24(2): 164–175, Summer 2015

What You Can't See *Can* Hurt You

Enterprise Risk Management: A Tail-Risk Perspective

STUART GREENBAUM, Washington University in St. Louis

Recent developments have highlighted the dangers of large risks with very small probabilities of occurrence. These catastrophic events are easily ignored by companies, thereby weakening the effectiveness of risk management. This article discusses the psychological phenomena at work when decision makers deal with these risks and how **Enterprise Risk Management (ERM)** can help overcome the psychological biases that hinder conceptualizing, interpreting, and dealing effectively with these risks.

When planning for the future, it is easy to turn a blind eye to risks that are highly unlikely to occur. Managers ignore them too often, whether to save money or avoid planning for a highly unlikely occurrence, and undervalue future risk. Ignoring these extreme risks may threaten the continuity or sustainability of an organization. However, with the implementation of an Enterprise Risk Management (ERM) framework, organizations can refine their thinking and reduce future hazards and in turn, better manage income.

Flawed risk management exposes the need for ERM

After the turn of the millennium, several giant corporations experienced avoidable disasters, exposing flawed ERM processes. The events that transpired with Fukushima Daiichi's nuclear power plant embodied this concept—disaster struck because of a questionable risk management system. When a tsunami hit, destroying three of Fukushima's nuclear reactors, one of the world's largest nuclear disasters unfolded. Although Fukushima could not have prevented the tsunami, its means of protecting its equipment from one was far from sufficient, admittedly because its disaster plan "didn't envision something this big." Had Fukushima Daiichi planned well for the unlikely tail risk, it might have avoided catastrophe. Just as Fukushima could have benefitted from

the enhanced communications and planning that comes with ERM, General Motors could have avoided the damage it experienced due to failures of an ignition-switch cover-up that cost at least 13 lives—an oversight that could have been avoided with proper ERM.

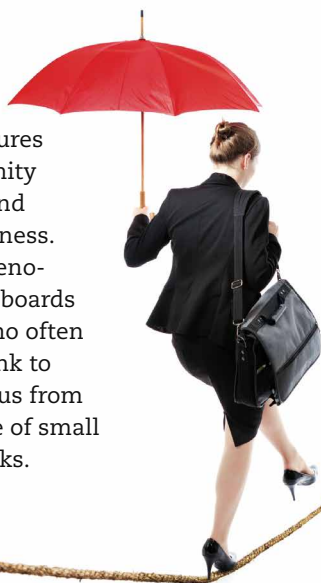
Some probabilities are too small to perceive

Tail risks are sometimes so difficult to perceive that they seem impossible, although we know this is not the case. However, with an ERM system in place, a well-established procedure for monitoring risks protects institutions from ignoring highly unlikely tail risks. When applying ERM concepts in an organization, more resources will be devoted to monitoring extreme risks that threaten the sustainability of the organization. While identifying and planning for risks, including tail risks, inevitably raises present operating costs, the impact it can have on the future of the organization by reducing the probability of tail risks is accretive. By subsuming all material risks, ERM accounts for previous challenges in risk management and focuses more narrowly on risks that may jeopardize operations. Because existential risks, and especially tail risks, are often subtle and nuanced, it becomes necessary to use a tool to magnify, amplify, and clarify. ERM does this by providing a clearer picture and path to eliminate obliviousness to risk.

Psychological barriers to risk perception

If these risks are so perilous, why do they continue to go undetected by managers? Nassim Nicholas Taleb's *Black Swan* and Daniel Kahneman's *Thinking Fast and Slow*, together with cognitive biases that impact managerial tendencies, start to shed some light on this behavior. While Taleb argues that risks are underestimated because they are unprecedented, Kahneman sees them as overpriced because they can hurt an organization more than equivalent successes can mitigate. Regardless of the approach, both agree that hazards are skewed owing to psychological biases or to neglect.

The behavioral side of risk management lends more insight on why organizations tend to ignore seemingly imperceptible risks, which can be devastating. Cognitive biases, including overconfidence, anchoring, and groupthink, get in the way of objective decision making. Overconfidence, a trait commonly associated with decision making, can lead to unwarranted optimism and an inflated sense of feeling immune to negative events. With anchoring bias, or focalism, the way in which information is presented influences decision making. For instance, if an organization recently incurred a large loss, it would likely overestimate the probability of a current loss. Unprecedented risks are ignored, and unless an extreme event has recently occurred, it will most likely be ignored. Finally, with groupthink, group dynamics show a major effect on decision making as members tend to abandon their independent voices. This can create a tendency to overestimate group power, vulnerability, morality, pressures toward uniformity of viewpoint, and closed-mindedness. We see this phenomenon among boards of directors, who often allow groupthink to divert their focus from the importance of small yet extreme risks.

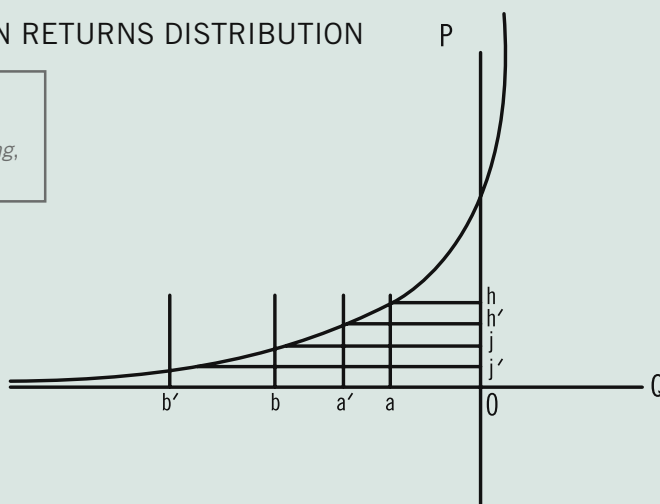


Plotting remote probabilities too small to be perceived

Consider that the most commonly used returns distributions—the Gaussian and power functions—are asymptotically zero in the negative quadrant. This trait has not been fully exploited in thinking about tail risks, and indeed, it holds the key to reconciling Kahneman and Taleb. Exhibit 1 depicts the power function returns distribution with probability (P) on the Y axis and outcome or quantity (Q) on the X axis. Notice that the negative tail is divided into three intervals: 0 to a , a to b , and b to minus infinity. From 0 to a , that containing the largest probabilities ($P \geq h$) is the Kahneman domain. These probabilities are readily observable, and attendant risks can be subject to overpricing owing to the Kahneman-Tversky loss aversion. The interval to the left of b contains remote probabilities ($P < j$), which are too small to be perceived without amplification and/or clarification. The notion of being too small to be perceived is quite natural and has numerous analogs. Molecules, atoms, and nanoparticles are all too small to be perceived without special instruments such as microscopes, telescopes, or particle accelerators. Likewise, sounds of sufficiently high frequency, audible to some animals, are inaudible to humans without special assistance. High-frequency trading provides yet another analogy where transactions are effected at speeds unaided humans find imperceptible. In all these examples, phenomena are indiscernible absent special instruments.

Exhibit 1 POWER FUNCTION RETURNS DISTRIBUTION

Source: "Tail-Risk Perspectives,"
The Journal of Investing,
Stuart Greenbaum.



The region of the power function in Exhibit 1 to the left of b contains positive probabilities that are simply too small to be perceived. Thus, without the assistance of special instruments, these hazards will be ignored or assigned zero probability.

This region is described by Taleb's *Black Swan*, but the hazards described may or may not be unprecedented. Unprecedented events neither imply imperceptibility nor are they implied by imperceptibility; that is, unprecedented events are neither necessary nor sufficient for imperceptibility. Imperceptible hazards are naturally assigned zero probability and will therefore be underpriced. Unprecedented events may or may not be assigned zero probability. Similarly, preceded events may be so improbable as to be effectively imperceptible, for example, a pandemic exterminating a large fraction of the human population. Nevertheless, most preceded events are likely to be perceptible and most unprecedented events will either be imperceptible or perceived with large errors. For example, in the case of Fukushima-Daiichi, a tsunami in excess of 15 feet was unprecedented but hardly unimaginable. Scientists had warned TEPCO that climate change was producing ever more violent climatic events and recommended a 30-foot seawall instead of the 15-foot version management chose to build. The tsunami that devastated Fukushima Daiichi was therefore perceived, albeit unprecedented. The imperceptibility of small probabilities to the left of b in Exhibit 1 thus subsumes Taleb's *Black Swan*, but is more general.

Perceived hazards fall to the right of b in Exhibit 1, but we define the interval a to b as the range of hazards perceived with large potential errors. Thus, the introduction of ERM has the effect of shifting a to a' and b to b' , leaving the interval between the clearly perceptible and the imperceptible (a' to b') possibly smaller or larger. But the set of hazards clearly perceived is increased, as is the set that is perceptible at all. Therefore, the set of hazards subject to Kahneman-Tversky overpricing is expanded and those subject to Taleb underpricing is diminished with the innovation of ERM.

Begin by adopting an ERM mind-set

Even without the resources necessary to implement a full ERM system, the concept has takeaways important for businesses of all sizes. While it might not be possible to bring in a complete task force of risk managers to monitor potential risks and analyze their costs, the first step is overcoming neglect and acknowledging that while some events are unlikely, they shouldn't be ignored. Planning for tail risks may be costly up front, but as seen with Fukushima and General Motors, underestimating tail risks can be hazardous to an organization. The first step is to align with best practices and improve communications when it comes to recognizing risks. Once communication is improved, a systematic approach to monitoring risks can reduce the likelihood of ignoring them, enhance information and improve decision making.

Greenbaum on reducing the possibility of ignoring small probabilities

"ERM is about all risks, or all risks that are significant enough to threaten the existence of the organization. The comprehensive definition is difficult to operationalize. The alternative is material risks people tend to ignore for a variety of reasons, and this tendency is what ERM addresses.

The question is how do you conceptualize this risk? How do you give it interpretation? That's what this paper has described. The ERM program is a little bit like introducing a microscope. A certain class of these probabilities now becomes visible. Why? Because you're looking for them regularly; you have specialists who are looking for these kinds of things. So the possibility of ignoring these small probabilities is reduced somewhat. I argue that the protocols of ERM are like instruments in physics and chemistry: they tend to enhance the visibility of these very small particles. Part of the ERM is an improved communication within the organization. For example, ERM requires that every unit in the organization reports to the chief risk officer every month or week on anything they see that might be threatening. Just the fact that every unit has to report reduces the probability that you'll ignore certain events."

**Cognitive biases
in human behavior
lead to ignoring
perilous risks.**





Paper: "Do Bank-Affiliated Analysts Benefit from Lending Relationships?"

Authors: Xiumin Martin, Washington University in St. Louis, and Ting Chen, Baruch College, City University of New York

Publication: *Journal of Accounting Research*, Vol. 49 No. 3, June 2011

Does Information Flow Over the Walls within Large Banking Conglomerates?

Analysis Finds that Bank-Affiliated Analysts Benefit from Lending Relationships

XIUMIN MARTIN, Washington University in St. Louis

Constructing walls within an organization to protect various interests is nothing new. Think of the supposed separation of church and state, editorial and advertising, and lending and equity trading divisions within large financial conglomerates. If these walls fail, the theory is that bank-affiliated analysts can acquire private information about the firms that borrow from them, helping improve the accuracy of the earnings forecasts pertaining to those firms. But does this really happen in practice? Based on our empirical analysis, the answer is yes. The enhanced forecast accuracies are even more pronounced for borrowers with greater informational asymmetry and more undisclosed bad news, and for deals with financial covenants. The analysis also shows that the informational advantage of bank-affiliated analysts exists only when the affiliated banks serve as lead arrangers, not merely as participating lenders. Overall, the evidence suggests that information does flow over the walls of commercial banking into equity research divisions within financial conglomerates.

Amid the financial crisis that started in 2007, large US investment banks such as Bear Sterns and Lehman Brothers have completely disappeared from the banking scene. The universal banking model, which allows financial conglomerates to combine a wide range of financial activities, emerged during the 1990s, particularly after the Gramm-Leach-Bliley Act of 1999 that formally repealed the Glass-Steagall Act of 1933. This system is arguably a more desirable structure for financial institutions from the viewpoint of policy makers due to its resilience to adverse shocks. This drastic change in the landscape of the financial industry has many implications for corporations in the United States. In this paper, we focus on the informational impact.

The traditional role of banks

Traditionally, have played the role of financial intermediary, collecting money from depositors and lending to other businesses. In doing so, banks that lend have a unique information advantage and an incentive to monitor those borrowers. For example, borrowers usually have a much closer relationship with their banks than with investors in their public securities such as stocks and bonds. In particular, borrowers often provide their lenders with materials and price-sensitive information, such as revenue projection updates or acquisition and divestiture plans, well in advance of its release to the public. In the absence of a perfect “Chinese Wall” separating the public from the private domain

within a financial conglomerate, the private borrower information possessed by loan officers can migrate to the public domain—the equity analysts and public trading and sales divisions. Consequently, security analysts can incorporate this information into their earnings forecasts and stock recommendations, which is eventually transmitted to the market before the borrower makes any public announcement. According to professor Xiumin Martin, “The lending side of the commercial banking business traditionally receives a lot of proprietary information from borrowers so lenders can monitor them. For example, borrowers are often required to provide lenders periodic financial statements that are not available to the public. Analysts on the public domain side are not supposed to get private or proprietary information, so all of their forecasts should be based solely on publicly available information. If these financial giants, what we call conglomerates, and their equity analysts show superior forecasting ability and that ability only improves after they have a loan with a specific borrower, that gives us a really strong belief or provides convincing evidence that the superior information generated from the lending business somehow leaked out or was shared with the equity analysts.”

Earnings forecasts of bank-affiliated analysts improve in accuracy after loan origination

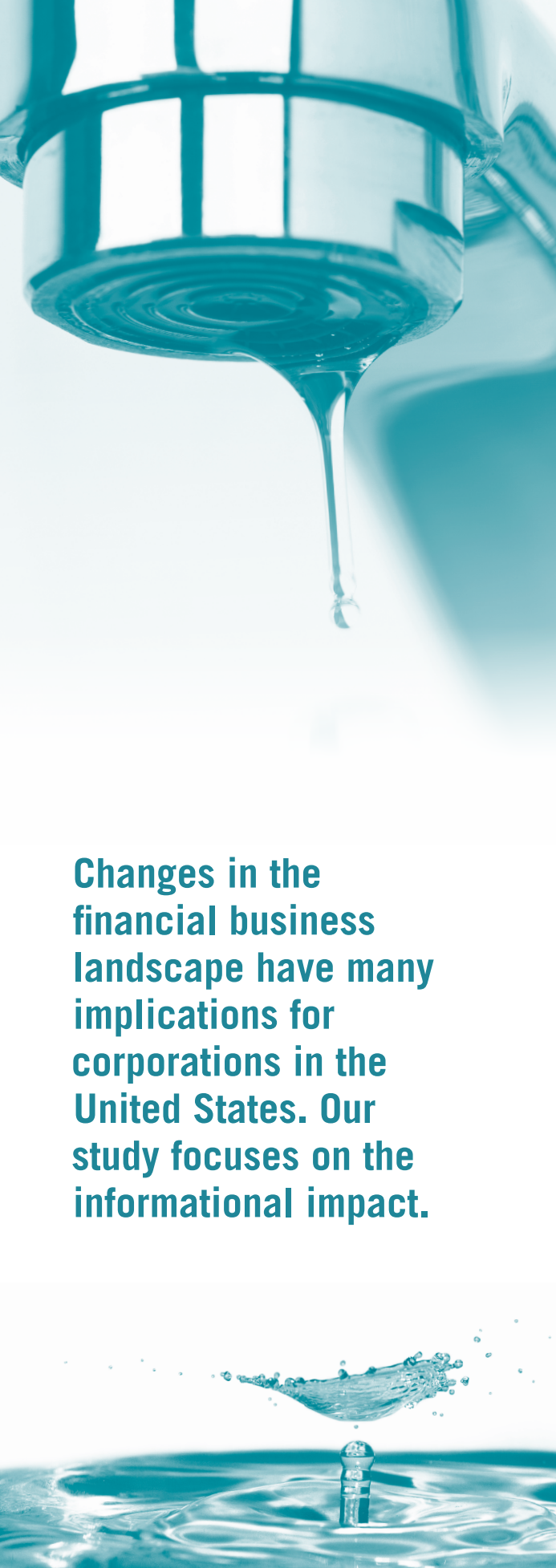
Based on syndicated loans obtained from Dealscan database, analyst forecasts from First Call, and companies’ financial information from Compustat, our empirical analysis uncovers four key findings. First, the accuracy of earnings forecasts from a bank-affiliated analyst for a borrower increases after the loan origination compared to the forecasts made by the same analyst for nonborrowing firms and compared to the forecasts made by non-bank-affiliated analysts for the same borrower. Relative to the benchmark forecasts, bank-affiliated analysts reduce the annual EPS forecast error by about 17 % of the average EPS forecast error in the sample. Second, the increase in forecast accuracy of bank-affiliated analysts is more pronounced for borrowers with greater information asymmetry as measured by size and the standard deviation of analyst forecasts. For example, these borrowers are usually smaller in size and the forecasts of their security analysts are more diverse. Third, the increase in forecast

accuracy of bank-affiliated analysts concentrates in instances where borrowers experience bad news, when borrowers have high credit risk, such as lower credit ratings or no credit ratings and a higher leverage ratio, and when loans contain financial covenants. Fourth, an informational advantage exists for conglomerate analysts only when conglomerates serve as lead arrangers but not as participating lenders. Taken together, the results provide a consistent picture that there is information spillover from the commercial lending division to the equity research division of a financial conglomerate and that bank-affiliated analysts benefit from this information spillover via more accurate forecasts.

Are these information spillovers beneficial?

Although information sharing is beneficial to financial conglomerates, it is not without controversy, particularly when much of the superior information comes from ongoing correspondence between borrowers and banks. In recent years, regulators and market participants have expressed concerns that the spillover of private information into the public domain might breach confidentiality agreements between lenders and issuers and, more importantly, could lead to illegal trading. Banks have tried to address this concern by establishing limits to the flow of information among different parts of a financial conglomerate: i.e., erecting Chinese Walls. Analysts, along with public trading and the sales desks they’re associated with, belong to the public side of the wall and are therefore not supposed to receive private information. Our findings suggest that despite the presumed existence of Chinese Walls, financial analysts still have access to superior information from lending relationships and take advantage of this access in improving their forecast accuracy. As a consequence, information spillover among different divisions within a financial conglomerate is likely to be of greater concern.

Relative to benchmark forecasts, bank-affiliated analysts reduce the annual EPS forecast error by 17%.



Changes in the financial business landscape have many implications for corporations in the United States. Our study focuses on the informational impact.

The results provide a consistent picture that there is information spillover from commercial lending to equity research divisions of financial conglomerates.



Paper: "The Wall Street Walk: When Blockholders Compete for Flows"

Author: Giorgia Piacentino, Washington University in St. Louis, and Amil Dasgupta, London School of Economics

Published: *The Journal of Finance*, 70 (6), December 2015

Taking a Run at the Wall Street Walk

Examining the Actors, their Motivations, and the Consequences

GIORGIA PIACENTINO, Washington University in St. Louis

Blockholders who are dissatisfied with a firm's management can act on their dissatisfaction by selling their shares in the firm, exerting downward pressure on the stock price and thus punishing the manager. This is called "the Wall Street Walk," and it has been shown that it can discipline the manager: he avoids misbehavior to avoid such selloffs by blockholders. However, the identity of the typical blockholder has changed significantly over the last 30 years: professional money managers, such as mutual funds, hedge funds, and pension funds, are now the main blockholders. It is not obvious that they have the same incentives that previous blockholders had, which raises an interesting question: Do these professional money managers actually do the Wall Street Walk? Or does the Wall Street Walk fail to discipline management when blockholders are money management professionals? Since such intuitional investors hold almost 80% of public equity, this is a critically important question for understanding corporate governance today. In a research paper in *The Journal of Finance*, Georgia Piacentino and Amil Dasgupta develop a model that demonstrates that money managers may be unable to discipline firm managers via the Wall Street Walk.

What would you do if you held the stock of a company and learned that its CEO was acting against your interests? For example, he was taking excessive perks or acquiring firms in unrelated businesses only to build a corporate empire for himself? Surely you would sell your shares, walking away from the company before the actions of management were made public and the price of your stock plummeted. By selling, you would be doing the Wall Street Walk.

Would you act the same way if you were a money manager investing on someone else's behalf? Would you still perform the Wall Street Walk? In this case, selling the stock could reveal that you made a bad investment decision—you invested in a company with a bad manager! So, you might

decide not to sell the shares to avoid revealing that you had made a bad decision by investing in the company in the first place. In other words, you might not do the Wall Street Walk in order to maintain a good reputation with your investors.

Blockholder potential

Blockholders are shareholders who own upwards of 3% of a company's shares. They are typically more involved in the firm than small shareholders, so they have more information about managerial actions. Because they have more at stake, blockholders are motivated to maintain a firm's value and use their investment power to ensure that managers act in the best interest of shareholders. When blockholders are unhappy with managerial decision making,

Blockholders
are
shareholders
who own
upwards of
3%
of a
company's
shares.

**The incentives
of money
managers are
not aligned
with those of
their clients.**

they can sell their shares, initiating the Wall Street Walk. Since blockholders are large, their selling can depress stock prices. This can be an effective punishment for misbehaving managers when executive compensation is linked to the market price of equity. The threat of the Wall Street Walk has been established as an important disciplining device to prevent managerial misbehavior—if a CEO is considering acting against shareholders' interests, he may think twice if he anticipates it will result in a Wall Street Walk, in which block sales lead to decreased compensation for him.

Nowadays, most blockholders are money managers, such as mutual funds, hedge funds, and pension funds. Many of these money managers are passive buy-and-hold investors who may not respond quickly to information about managerial misbehavior. This raises an important question for corporate governance: Is the Wall Street Walk a credible threat in firms with institutional blockholders?

To address this question, Georgia Piacentino of Washington University Olin Business School and Amil Dasgupta of London School of Economics developed a theoretical model. Dr. Piacentino describes the motivation for the research as follows: "In the last thirty years, the composition of shareholders has changed significantly in the United States. Before, shareholders were mainly rich individual investors who were trading shares on their own behalf. Nowadays, almost 80% of public equity is in the hands of mutual funds, hedge funds, and pension funds. They are not investing for themselves, but for others. Their incentives differ, and nobody has ever looked at how this affects the governance through exit."

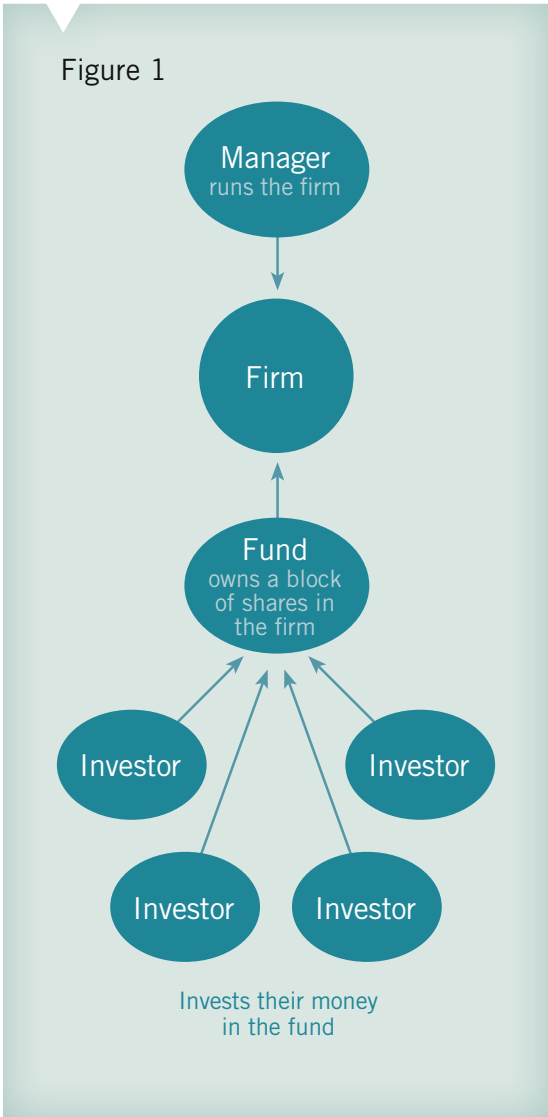
The main finding of the paper is that the threat of exit is not an effective way for professional money managers to discipline corporate managers. The key to this result is the observation that investment professionals have different incentives than individual investors. Unlike individual investors, fund managers are not only concerned about portfolio returns, but are also concerned about maintaining a good reputation. A good reputation helps them to win new clients and to avoid losing old ones. When a blockholder cares about his reputation, he may turn a blind eye to underperforming management. This is because selling shares

could reveal that he has made an unwise investment. Thus, money managers may retain underperforming shares, thereby sacrificing the disciplining of management. This finding overturns previous results that suggest the threat of blockholder exit acts as a governance mechanism.

What’s their motivation?

In the model, money managers’ reputation concerns generate a conflict of interest between them and their clients. Absent reputation concerns, a money manager who observes a corporate manager’s misbehavior simply exit, liquidating his shares to maximize capital gains. This would not only maximize the wealth of investors in the fund, but also imposes a credible threat on corporate management, preventing their misbehavior. However, in the real world, things are more complicated. The incentives of money managers are not aligned with those of their clients. Fund managers worry that divesting large blocks is a tacit admission that forming the block was not a good investment in the first place. This could cause fund investors to question the fund manager’s stock-picking ability. This concern about the potential damage to professional reputation may cause the fund manager to pause before exiting a firm in which the manager is not maximizing shareholder value. “We showed that some fund managers will not be able to discipline corporate managers by exit,” says Piacentino. “The intuition is that the fund managers are motivated not only by their direct profits, but also by their reputations. This may induce the fund manager to avoid exit. But

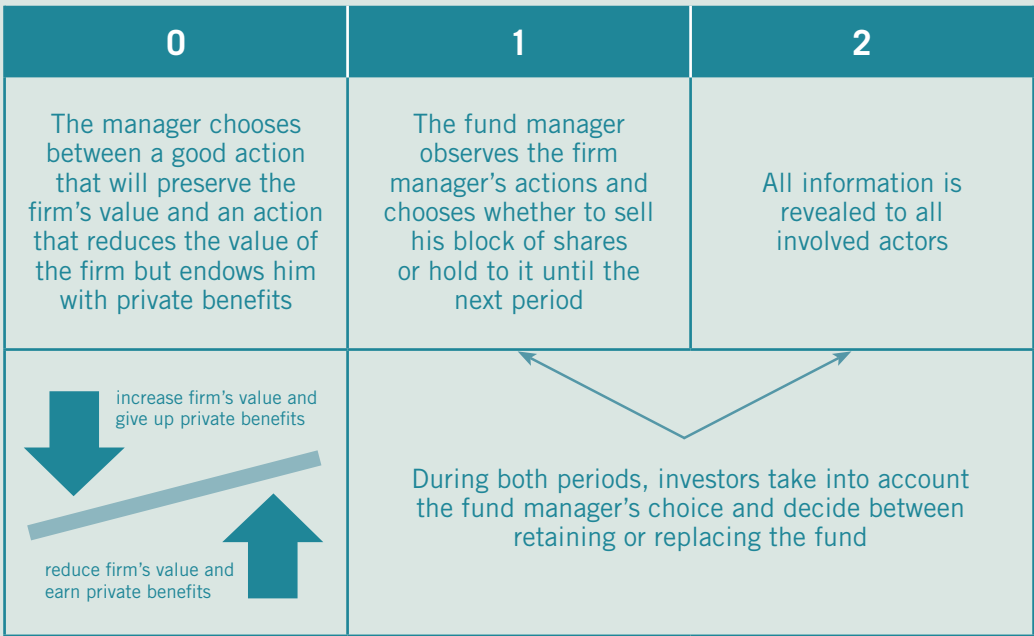
then if the fund doesn’t exit, the firm’s manager will not be disciplined, so firm value will not be maximized. Our analysis focuses on how this motivational dynamic affects the corporate governance problem.”



Mutual fund managers may act differently than hedge fund managers

Is there a way to discern whether a fund manager will be effective at governing via exit? Yes, by looking at the fees he charges the fund’s clients. We demonstrate that funds, such as mutual funds, that derive only a small fraction of their fees from explicit profit-based compensation are less effective at governing firms than are funds, such as hedge funds, that derive a larger fraction of their fees from profit-based compensation.

Figure 2



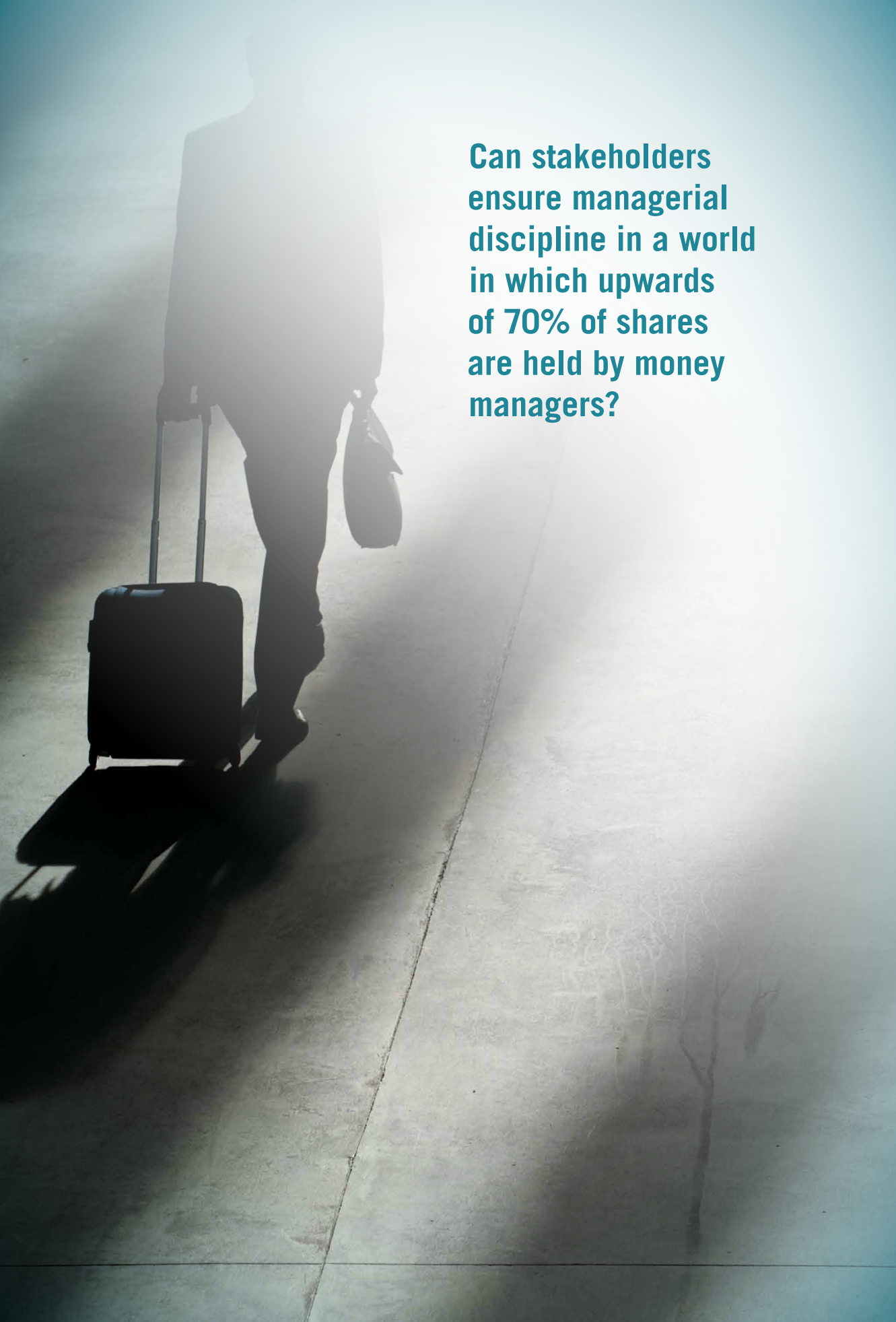
According to the model, the fund manager will consider two components of fund income before deciding whether to exit. First, since the fund's profit from investing in the specific firm is usually calculated as a fraction of the return on investment, the fund manager must keep in mind the profitability of the firm in which he suspects mismanagement. Second, because the fund manager receives a payment from each client that is independent of fund performance, the fund manager is also interested in making sure that clients stay, something that requires the fund manager to have a good reputation for high ability. Thus, fund managers whose compensation is highly dependent on fund flows will care more about their reputations than they care about fund profits and will shy away from disciplining management. A fund manager whose compensation is linked more to fund profits (or return on investment) rather than to fund flows is more likely to discipline management by exiting a firm in which the manager is not maximizing shareholder value.

According to this theory, in mutual funds, where fund managers are not explicitly compensated based on return on investment but where fund flows are important, the fund manager

will be relatively ineffective in using exit as a disciplinary device. By contrast, hedge funds, in which a significant fraction of compensation is based on return on investment, will be more effective in using exit as a source of corporate governance discipline. These are useful lessons for investors to keep in mind when deciding whether to invest in a mutual fund or a hedge fund, and also for individual investors who may want to consider which blockholders have major ownership in these firms and its implications for corporate governance.

Policy

Hopefully our result raises real-world stakeholders' awareness of the fact that the identity of their firms' blockholders is crucial for good governance. Stakeholders should encourage individual or hedge fund blockholders to increase firm value. Our research paves the way for future research on corporate governance, starting with the question of how stakeholders can ensure managerial discipline in a world in which upwards of 70% of shares are held by money managers. Can we alter money managers' fees to mitigate the problem, or should we not rely on blockholders to implement good governance?

A silhouette of a person walking away from the viewer on a light-colored, reflective floor. The person is carrying a rolling suitcase in their right hand and a briefcase in their left. The background is a bright, hazy light source, creating a strong silhouette effect. The floor has a faint, cracked texture.

**Can stakeholders
ensure managerial
discipline in a world
in which upwards
of 70% of shares
are held by money
managers?**



Paper: "Duration of Executive Compensation"

Authors: Radhakrishnan Gopalan, Washington University in St. Louis; Todd Milbourn, Washington University in St. Louis; Fenghua Song, Pennsylvania State University; and Anjan V. Thakor, Washington University in St. Louis

Publication: *Journal of Finance*, 69 (6), 2,777–2,817, August 1, 2012



Establishing an Executive Pay Duration Measure to Align with the Interests of Shareholders

RADHAKRISHNAN GOPALAN, Washington University in St. Louis

TODD MILBOURN, Washington University in St. Louis

ANJAN V. THAKOR, Washington University in St. Louis

The global financial crisis was blamed in part on myopic managerial behavior and excessive risk taking, incentivized by executive compensation practices. While there is much debate about the dangers of short-term performance incentives, there has been no acceptable way to quantify the duration of executive compensation. To fill this void, researchers at Washington University's Olin Business School have created a simple measure of establishing pay duration and documented its relationship with various firm characteristics. Their findings are forthcoming in a research paper soon to be published in *The Journal of Finance*, a top journal in academic finance research. The paper can prove useful for those designing executive compensation to better align the interests of executives with their shareholders.

The financial crisis and the ensuing need for transparency have placed the topic of executive compensation in the spotlight. Over the past decades, the amount that executives make has dramatically risen, and the 2008–2009 global financial crisis highlights a growing dilemma about the short-term outlook that many executives are accused of adopting. Investors and shareholders alike worry that an excessive focus on the short term in executive compensation encourages executives to take short-run risks that do not reflect long-term company values or goals. Former Treasury Secretary Timothy Geithner encourages paying top executives “in ways that are tightly aligned with the long-term value and soundness of the firm.” Similarly, 27 prominent figures in business, academia, and government endorsed the Aspen Institute's statement that argues that short-term agendas need to be curtailed and regulated. Supporters of this statement include Warren Buffett, John C. Bole, founder of The Vanguard Group, and Bill

George, professor of management practice at the Harvard Business School.

However, designing compensation to encourage executives to focus on the here and now also has an upside. It may also induce them to be more vigilant about the company's current needs, allowing them to respond quickly to changing market conditions, rather than opting for the “quiet life” and making decisions whose consequences may not be revealed until after the executive's retirement. That is, there may be circumstances in which emphasizing short-term performance aligns the shareholders' and executive's goals more effectively than taking a more long-term approach.

While this debate rages on, there is a conspicuous absence of specificity when discussing the real extent of “short termism.” One person may consider a year short term, while someone else thinks it's three. Without a specific measure

Despite all the talk about short-term executive compensation inducing myopic decision making, there has been no evidence, because there's been no way to measure the short- or long-term orientation of any compensation package. In this paper, a new way to measure this is introduced, called “pay duration.”

of what constitutes duration, it is difficult to evaluate the merits of different positions on this important subject. This research on how to measure pay duration and its relationship with other firm characteristics helps fill the knowledge gap in the design of executive compensation.

What is short termism?

Short termism is an excessive short-term focus that can potentially manifest itself as myopic executive actions. Concentrating on short-term results with insufficient regard for long-term goals, such as research and development, may jeopardize shareholders' and executives' interests. Additionally, many point out that a side effect of this perspective can lead to unethical behavior, fraud, and financial damage in the long run. While much is made of the ills of short termism in executive compensation, in reality, very little is known empirically about the extent of short termism in CEO compensation and how to calculate it. Radhakrishnan Gopalan, Todd Milbourn, and Anjan V. Thakor from Olin Business School at Washington University in St. Louis, and Fenghua Song from Smeal College of Business, Pennsylvania State University, have developed a novel measure of executive pay duration that reflects the vesting periods of different components of compensation, thereby quantifying the extent to which compensation is short term and the extent to which it is long term. By developing this measure, the average pay duration for different industries sets a baseline and gives an idea of the extent to which compensation is short term.

Pay duration measure

Because all the elements in the executive's total compensation package—salary, bonus, restricted stocks, and stock options—have varying duration periods, this novel measure takes these vesting periods into account. A close cousin of the duration measure developed for bonds, the pay duration measure is computed as the weighted average of the vesting periods of each of the components. The weight for each component is the fraction of that component in the executive's total compensation package.



Pay duration, using this formula, is estimated as:

$$\text{Duration} = \frac{(\text{Salary} + \text{Bonus}) \times 0}{\text{Total Compensation}} + \frac{\sum_{i=1}^{n_s} \text{Restricted Stock}_i \times t_i}{\text{Total Compensation}} + \frac{\sum_{j=1}^{n_o} \text{Option}_j \times t_j}{\text{Total Compensation}}$$

More specifically, when calculating the weighted average, researchers divided the component by the total compensation package and multiplied it by the vesting period, the time required before the employee gains absolute rights over the assets. It should also be noted that because duration is calculated relative to the year-end, Salary and Bonus have a vesting period of zero. With this measure, it is clear that what matters is not how much you pay, but how you pay.

For example, imagine two managers both earning a total compensation package worth a million dollars. Manager 1 receives a \$500,000 salary, \$300,000 bonus, and \$200,000 worth of restricted stocks that are vested after one year. Manager 2 receives a \$300,000 salary with \$100,000 bonus. Manager 2 also receives \$300,000 worth of stock options, with \$100,000 vested in three years and \$200,000 vested in four years.

Manager 1

\$500,000 Salary
+ \$300,000 Bonus
+ \$200,000 Restricted Stock,
vests in one year

\$1,000,000 total

Manager 2

\$300,000 Salary
+ \$100,000 Bonus
+ \$300,000 Restricted Stock,
vests in 2 years
+ \$300,000 Stock Options,
with \$100,000 vests
in 3 years and \$200,000
vests in 4 years

\$1,000,000 total

Calculate duration pay using this novel measure:

Manager 1

$$\left(\frac{500,000}{1,000,000} \times 0\right) + \left(\frac{300,000}{1,000,000} \times 0\right) + \left(\frac{200,000 \times 1 \text{ year}}{1,000,000}\right) = 0.2 \text{ years}$$

Manager 2

$$\left(\frac{300,000}{1,000,000} \times 0\right) + \left(\frac{100,000}{1,000,000} \times 0\right) + \left(\frac{300,000 \times 2 \text{ years}}{1,000,000}\right) + \left[\left(\frac{100,000 \times 3 \text{ years}}{1,000,000}\right) + \left(\frac{200,000 \times 4 \text{ years}}{1,000,000}\right)\right] = 1.7 \text{ years}$$

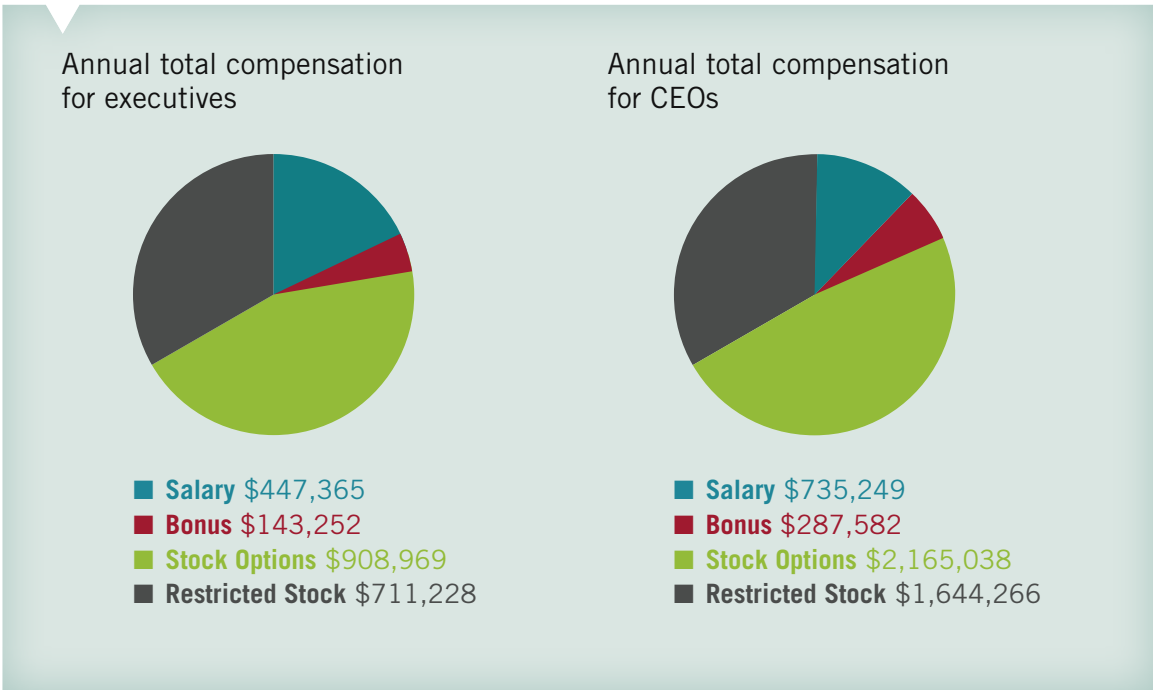
Even though both managers had the same total compensation, their pay packages were designed with differing pay duration periods. Given the choice between the two managers' pay packages, an executive will most likely choose the shorter pay duration. But from a shareholder's point of view, rewarding managers with compensation tied to longer durations may help align shareholders' interests with the executive's actions.

CEOs have longer pay durations than other executives

Using data for all executives of S&P 1500 companies during the years 2006-2009, the research found that average pay duration for all executives (including those below the CEO) is around 1.22 years, while CEO pay has a slightly longer duration, about 1.44 years. On average, executives with longer-duration contracts receive higher total compensation, but lower bonuses.

“This was the first result we had that gives us a sense of how long it is before executives can actually sell their shares in the market,” said Gopalan from Olin Business School. “It’s not long in comparison to the typical length of projects these firms undertake. If you were to give an executive stock options to incentivize investing in projects, then you would want the executive to be able to take these shares and sell them only when the project matures and the cash flows are available. Typically, cash projects are 5–10 years long, while these vesting periods are much shorter than that.”

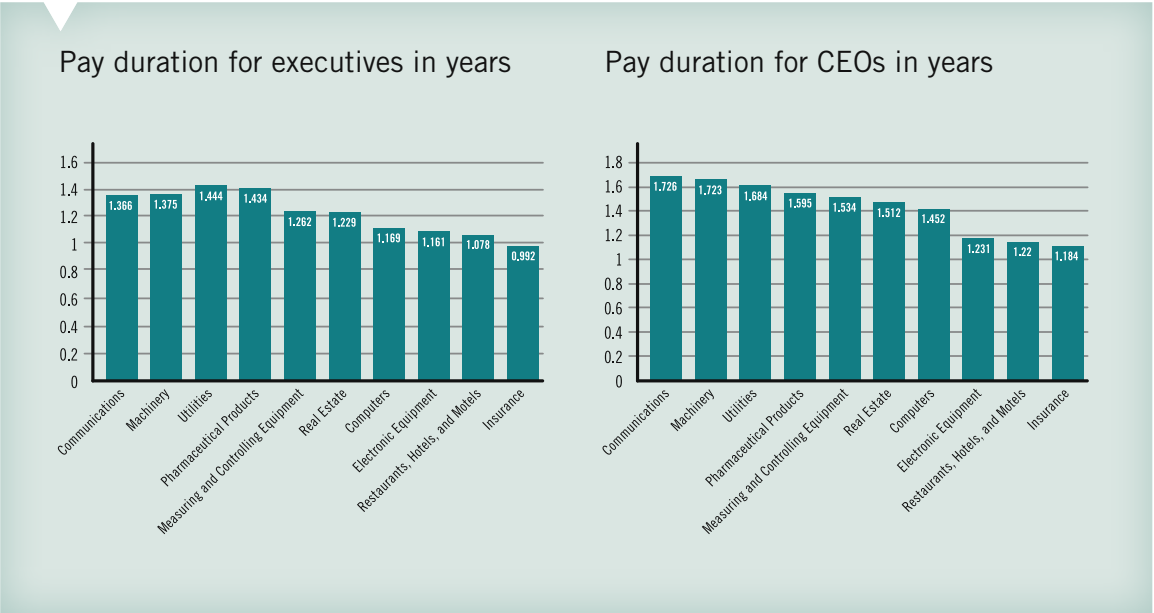
It is also important to note that average annual total compensation for the sample executive is \$2,214,425, which consists of \$447,365 of salary, \$143,252 of bonus, \$908,969 of stock options, and \$711,228 of restricted stocks. For only CEOs, the average annual total compensation is \$4,841,917, which consists of \$735,249 of salary, \$287,582 of bonus, \$2,165,038 of stock options and \$1,644,266 of restricted stocks.



“We suspected that the finance industry would have one of the shortest pay durations if its compensation structures led to risk taking. We did not find that. We found that financials rank somewhere in the middle, and that was surprising to us.”
— Radhakrishnan Gopalan

Pay duration across different industries

In order to illustrate the relationship between pay duration and industry, researchers calculated pay durations for all firms and categorized them into industries using the Fama-French 48 industry classifications. The graphs show the 10 industries with the most firms and the average pay duration in each industry.



Researchers found that industries such as defense, electrical equipment, and coal that have assets with longer duration are also those with longer executive pay duration for both CEOs and all executives. Interestingly, executives in the finance-trading industry have relatively long pay durations on average, ranking 11th among the 48 industries. Out of all firms in the finance-trading industry, banking firms have the shortest executive pay durations.

Gopalan explains, “We focused on finance-trading firms and how they stacked up against firms in other industries because there were questions about financial firms’ motivations to take risks. The idea is that firms in other industries were not taking these kinds of risks. We suspected that the finance industry would have one of the shortest pay durations if its compensation structures led to risk taking. We did not find that. We found that financials rank somewhere in the middle, and that was surprising to us.”

Pay duration and project duration

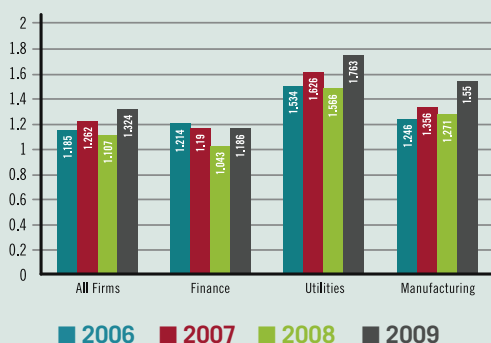
Executive pay duration is positively correlated with project and asset duration. Industries with longer duration projects, such as defense and utilities, offer longer-duration pay to their executives. “On average, if you look at firms with long- and short-duration projects, firms with long-duration projects seem to offer long-duration pay,” says Gopalan. “The same applies to short-duration projects. In some instances, firms seem to match the duration of executive compensation with the duration of the project.”



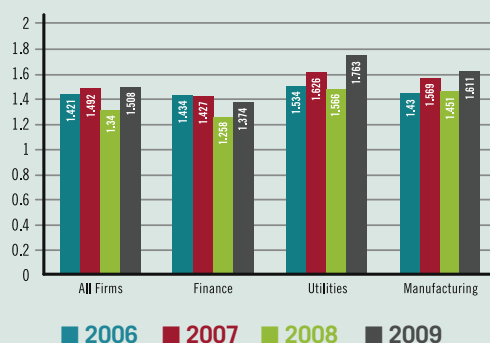
Pay duration over time

The average duration has increased from 1.185 years in 2006 to 1.324 years in 2009. But within broad industry groups, the increase in duration has been confined to firms in the utilities and manufacturing industries.

Industry pay duration
for all executives



Industry pay duration for CEOs



Who gets the long end of the stick?

To determine the characteristics of executives with long pay durations, researchers calculated the pay duration for all executives and split the data into groups with above- and below-median pay duration to compare the characteristics across the two subsamples.

Executives with above-median pay duration have a higher annual total compensation, which is reflected in three components of pay, but most noticeably in the values of option and restricted stock grants. Interestingly, executives with longer-duration pay contracts receive about \$62,523 less bonus on average.

Firms with longer pay durations are usually larger and have lower leverage, higher stock returns in the recent past, and more liquid stock. These longer contracts are more likely to be offered to the CEO than to other executives. Firms awarding longer-duration pay contracts also have higher sales growth, higher market-to-book ratios, a higher proportion of long-term assets, and higher R&D expenditures as a proportion of total assets. This indicates that firms experiencing faster growth and facing greater growth opportunities offer longer-duration pay contracts.

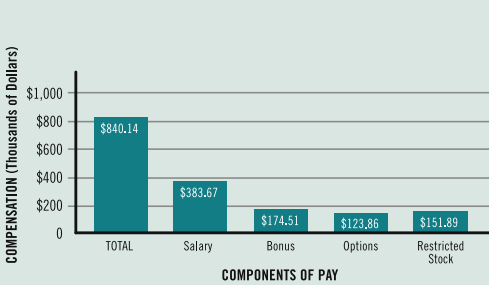
Pay duration and incentives to manipulate short-term performance

Earnings management is the use of accounting techniques to make earnings look more favorable to investors and shareholders. This research used the level of abnormal accruals to measure the manager's attempt to manipulate short-term performance. Firms with high (low) abnormal accruals will have high (low) current period earnings and low (high) future earnings.

Researchers found that firms offering shorter-duration pay contracts to their CEOs have higher abnormal accruals in the current period. This relationship is even stronger for small firms, young firms, and firms with less liquid stocks, since the idea is that it would be easier for managers to mislead the market. Firms that offer longer-duration pay contracts to their CEOs are associated with lower levels of abnormal accruals. Researchers noted that this indicates that longer-duration pay contracts reduce a CEO's incentive to engage in earnings-enhancing accruals.

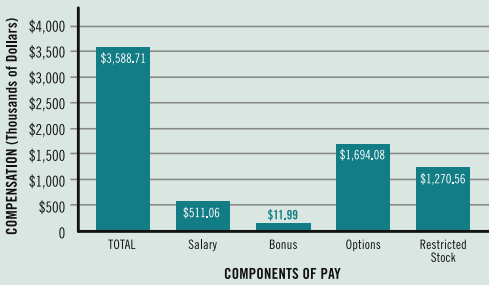
According to Thakor of Olin Business School, "Right now, all of the discussion in terms of executive compensation at the board level is about two dimensions: level of compensation and the sensitivity to performance. There is a third dimension to think about when setting executives' compensation, and that is pay duration and how it is matched with a firms' strategy and project duration. For example, if

Pay for all executives with short duration



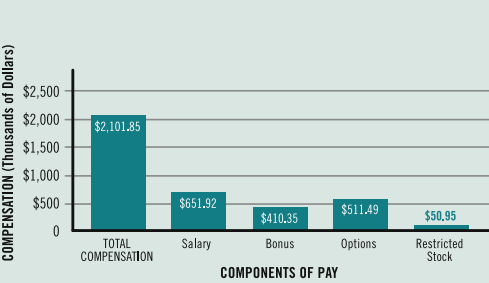
Duration: 0.421 years

Pay for all executives with long duration



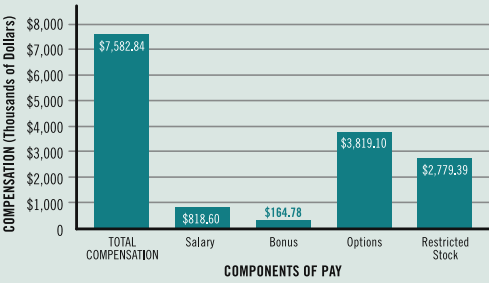
Duration: 2.016 years

Pay for CEOs with short duration



Duration: 0.615 years

Pay for CEOs with long duration



Duration: 2.265 years

I'm designing compensation for somebody in AT&T who is responsible for transmission and telecommunications, they will have projects that have payback periods of some 15 years, or however long it takes for the investment to be recovered through cash flows. Well, I certainly would want longer pay duration for these guys than for someone who's running consumer electronics. If the board of directors wants to align the interests of the CEO with the interests of the shareholders, then they want pay duration to match the duration of projects. So when somebody says, well, executive compensation induces myopia, or it causes CEOs to be short-term oriented, we can at least ask what that means."

Researchers found that firms offering shorter-duration pay contracts to their CEOs have higher abnormal accruals in the current period.



Paper: "CEO Compensation and Corporate Risk-Taking: Evidence From a Natural Experiment"

Authors: Todd A. Gormley, University of Pennsylvania; David A. Matsa, Northwestern University; and Todd Milbourn, Washington University in St. Louis

Published: *Journal of Accounting and Economics*, 56, 79–101, August 27, 2013

How an Increase in Business Risk Affects the Design of Managerial Compensation and Its Managers' Actions

TODD MILBOURN, Washington University in St. Louis

In the last 30 years, use of option-based compensation for corporate executives has drastically increased. In response to the global financial crisis and deep economic recession that followed, managers were often accused of taking excessive risks. Researchers from Washington University in St. Louis's Olin Business School, University of Pennsylvania's Wharton School and Northwestern University's Kellogg School of Management explored the relationship between CEO compensation and corporate risk.

John Markoff and David Leonhardt, writers for the *New York Times*, assert that critics say “the popularity of options gave executives an incentive to push up their stock prices by any means at their disposal, including questionable ones.” Corroborating this, the US government-sponsored Financial Crisis Inquiry Commission (FCIC) reported in 2011 that options “had the unintended consequence of creating incentives to increase both risk and leverage, which could lead to larger jumps in a company's stock price, [motivating] financial firms to take more risk and use more leverage.”

Does option-based compensation encourage managers to take unnecessary risk?

On the one hand, option-based compensation incentivizes risk taking because managers share

directly in the gains, but not symmetrically in all the losses. A stock option is used by the holder for a future purchase of stock at a fixed price. So when the stock price increases, managers gain the spread between the actual stock price and the fixed-option cost. But when the share price becomes lower than the fixed-option price, they gain nothing and lose only the value of the option. On the other hand, options have the ability to increase a manager's exposure to his firm's risk, decreasing the manager's wish to take risks.

In order to examine this relationship, the researchers found a unique way to deal with the identification problem. They explored changes in business environment that increase risk. Every firm is exposed to risks in its business environment, and those risks take many

What comes first, the chicken or the egg? Does the firms' risk environment affect managers' contracts? Or does the use of stock options encourage manager risk taking?

different forms such as technological irrelevance, adverse regulatory changes, asset expropriation, and so on. The researchers examined a risk that is exogenous and unanticipated, which allowed them to assess how managers' compensation would change and how these incentives affect managers' risk-taking choices.

Focusing on a specific risk scenario

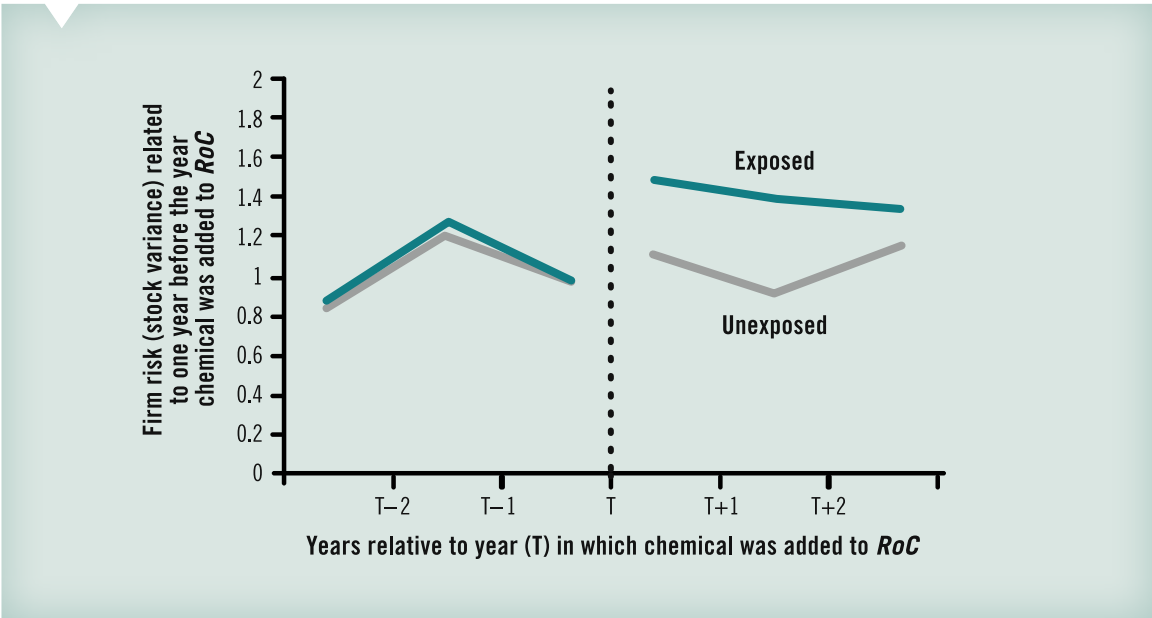
Milbourn and his colleagues focused on an increase in risk that occurred after a firm's workers were exposed to a chemical identified as a carcinogen. This risk ensnares the firm in a variety of concerns that require it to spend large amounts of money on legal fees, damage payments, and insurance premiums, which increases the cost of doing business. An increase in carcinogen risk reduces the profitability of new investments for the firm for a number of reasons. The risk reduces expected proceeds from new investments that use the chemical as an input because new regulation costs will swallow much of the profits. Additionally, any future lawsuits or adverse regulatory changes further consume cash returned from new investments that may or may not use the carcinogen input. Because shareholders may prefer the firm to pay out existing cash holdings to hedge against lawsuits, they are less willing to fund new investment. A predecessor study conducted by two of the authors of this paper (Todd Gormley and David Matsa) in 2011 found that the total legal liability faced by exposed firms tends to be around 5% of their assets and the new carcinogen listing could increase costs translating to a thirtyfold increase in the probability of financial distress.

Using the same empirical setting of this changing risk environment, the researchers here examined in what way boards change the structure of CEO compensation and whether managers' compensation structure is ultimately related to managerial risk taking. After all, the riskiness of firms' investment opportunities is widely thought to be an important determinant of managers' compensation. They kept two important questions in mind: 1) How do boards of directors adjust compensation in response to changes in their firm's business risk (increases in carcinogens, for example)? and 2) How do these incentives affect managers' risk taking?

Researchers sought the answers to two important questions: 1) How do boards of directors adjust compensation in response to changes in their firm's business risk (increases in carcinogens, for example)? and 2) How do these incentives affect managers' risk taking?

Identifying and comparing firms at risk vs. firms with no exposure

Before answering these questions, the researchers identified firms that were affected and unaffected by carcinogens. To identify the dangerous carcinogens, they consulted the Report on Carcinogens (RoC). Published by the U.S. Department of Health and Human Services every two years, the RoC lists chemicals that are presumed to be cancerous. To identify the exposed firms, the researchers consulted the National Occupational Exposure Survey. For each carcinogen, the group gathered a list of exposed companies and as a parallel group of companies in the same industry that were not exposed. Before the carcinogen was discovered, the researchers found that exposed and unexposed companies were similar in features such as average stock variance, size, market-to-book, profitability, annual compensation, and equity-based incentives. After the discovery of the carcinogen in the affected group, there was a stock variance divergence of 60%, as illustrated in the figure below. This divergence mirrors the increase in business risk for the affected firms.

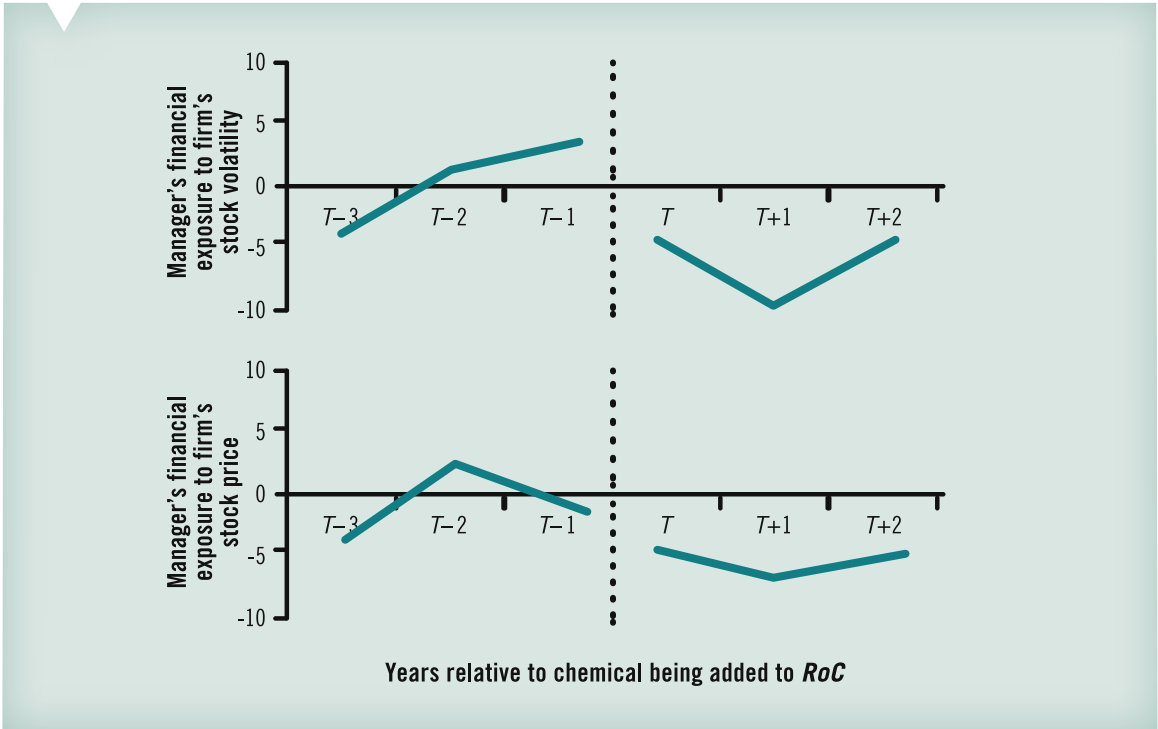


How business risk affects the structure of managerial compensation

To find out how compensation is adjusted in response to business risk, researchers examined companies that were affected and unaffected by the discovery of carcinogens. Then they analyzed the impact of the increase in risk on annual manager compensation. They found that boards of directors modify the composition of a manager's pay by altering stock and options in their compensation immediately after risk increases. Naturally, this alters the incentive structure as well, because the makeup of a manager's compensation determines that manager's incentive to take risks. Boards of directors alter how much of a manager's compensation package is affected by stock price movement and volatility in an attempt to insulate compensation from the decline in investment that shareholders wish to pursue after carcinogen discovery.

The figure below depicts relative changes in a manager's financial exposure to a firm's stock volatility ("vega") and price ("delta"), respectively. There is no indication of a decrease in financial exposure to firm stock price and volatility prior to carcinogen discovery. Beginning the year of discovery, however, exposed firms reduce their CEO's exposure to firm stock price and volatility. From this year onward, these reductions continue to stay lower.

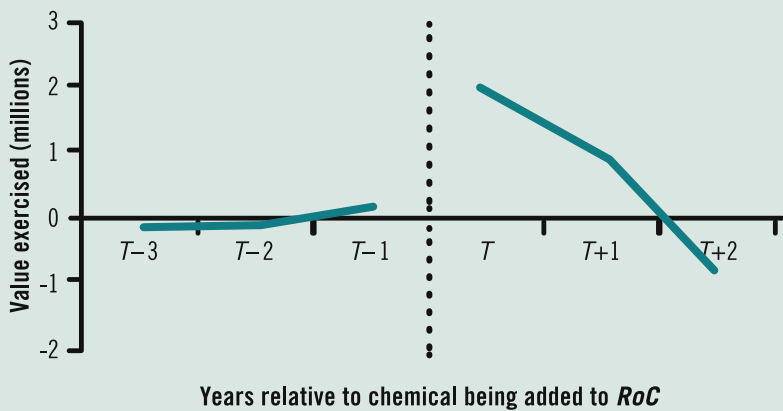
When a firm's business risk increases, executive compensation becomes less sensitive to the firm's stock price and its volatility. The executives exercise their vested options and sell restricted stock to reduce their exposure to business risk.



How do managers respond to the increase in their firm's risk?

Milbourn and his colleagues found that a manager will alter his or her financial exposure to the new risk by exercising vested options as well as by selling restricted stock in his or her company. After the increase in carcinogens, CEOs of exposed firms attempted to dilute overall risk exposure. They exercised an additional \$2 million in options in the year that risk increased and another \$1 million the following year relative to nonexposed firm managers. Also, qualitatively, there was a decrease in the number of company stock shares owned by managers of exposed firms, which suggests that managers sold shares to distance their portfolios from the increase in unanticipated risk.

The figure below plots options exercised by managers at exposed firms from three years before the risk increases, T-3, to three years after the risk increases. In the years prior to carcinogen discovery, the value exercised is nearly flat. Yet upon discovery, managers at exposed firms begin to exercise more options compared to those at unexposed firms.



Managers with reduced exposure to business risk are less likely to engage in diversifying acquisitions, reduce R&D expenses, and increase cash holdings in order to reduce their firm's risk.

How the structure of managerial compensation affects corporate risk

After exploring how the increase in an exogenous carcinogen risk affected manager's compensation portfolios, the researchers examined how incentives affect managerial risk taking. In response to the increase in risks, affected companies can take actions to decrease risk. For instance, they can increase cash holdings, decrease leverage and R&D expenditures and make diversifying acquisitions. In light of this, in 2011, Gormley and Matsa found that most firms respond by reducing leverage and diversifying through acquisitions of firms with relatively high-operating cash flows. Milbourn and his colleagues found that CEOs whose compensation is more sensitive to stock volatility are less likely to act in order to offset increases in exogenous risk. It is not as imperative for them to reduce risk, because that would lower the expected value of their payoff. Thus, they are less likely to engage in diversifying acquisitions, reducing leverage, cutting R&D expenditures, and increasing cash-to-asset ratios than their counterparts.

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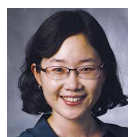
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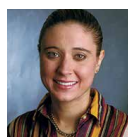
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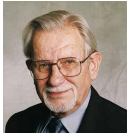
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Research interests: corporate
disclosure policy, financial reporting

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