

## DOES A LONG-TERM ORIENTATION CREATE VALUE? EVIDENCE FROM A REGRESSION DISCONTINUITY

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**Research summary:** In this paper, we theorize and empirically investigate how a long-term orientation impacts firm value. To study this relationship, we exploit exogenous changes in executives' long-term incentives. Specifically, we examine shareholder proposals on long-term executive compensation that pass or fail by a small margin of votes. The passage of such "close call" proposals is akin to a random assignment of long-term incentives and hence provides a clean causal estimate. We find that the adoption of such proposals leads to (1) an increase in firm value and operating performance—suggesting that a long-term orientation is beneficial to companies—and (2) an increase in firms' investments in long-term strategies such as innovation and stakeholder relationships. Overall, our results are consistent with a "time-based" agency conflict between shareholders and managers.

**Managerial summary:** This paper shows that corporate short-termism is hampering business success. We show clear, causal evidence that imposing long-term incentives on executives—in the form of long-term executive compensation—improves business performance. Long-term executive compensation includes restricted stocks, restricted stock options, and long-term incentive plans. Firms that adopted shareholder resolutions on long-term compensation experienced a significant increase in their stock price. This stock price increase foreshadowed an increase in operating profits that materialized after two years. We unpack the reasons for these improvements in performance, and find that firms that adopted these shareholder resolutions made more investments in R&D and stakeholder engagement, especially pertaining to employees and the natural environment. Copyright © 2016 John Wiley & Sons, Ltd.

### INTRODUCTION

Agency theory argues that managers' preferences are misaligned with those of the shareholders. As a result, managers invest in projects that are not the first-best from the shareholders' perspective, leading to a decrease in firm value. Traditional agency models focus on managers' preference

for, e.g., empire building (e.g., Jensen, 1986), shirking (e.g., Bertrand and Mullainathan, 2003; Holmstrom, 1979), or too little risk taking (e.g., Gormley and Matsa, 2016; Holmstrom, 1999). In contrast, the question of whether companies face a *time-based* agency problem—i.e., whether managers' time preferences are misaligned with those of the shareholders—remains to be explored.

In this article, we aim to fill this void. Specifically, we explore whether managers have a higher discount rate—that is, a preference for the short term—relative to shareholders. Anecdotal evidence suggests that this might be the case. Indeed, a large number of companies focus on meeting short-term goals, even if doing so hinders the pursuit of

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superior long-term projects. Perhaps the most striking evidence is provided in a survey by Graham, Harvey, and Rajgopal (2005), who find that 78 percent of the surveyed executives would sacrifice projects with positive net present value (NPV) if adopting them resulted in the firm missing quarterly earnings expectations. Overall, this evidence is suggestive of a time-based agency problem.

If managers are myopic, we expect that the adoption of a longer-term orientation (e.g., through the provision of long-term incentives to the managers) increases firm value. In other words, by adopting longer time horizons, companies are able to counteract managerial myopia and hence align managers' interests with long-term value creation.

From an empirical perspective, it is difficult to examine the effect of a long-term orientation on firm performance. There are two main obstacles. First, temporal orientation is inherently unobservable. Second, temporal orientation is likely endogenous with respect to financial performance, which makes it difficult to establish causality. For example, finding a positive correlation between empirical measures of long-term orientation and performance may be driven by "deep pockets": companies that perform better need to worry less about the short run and hence can more easily afford to be long-term oriented. Similarly, the relationship between a long-term orientation and firm performance may be spurious if it is driven by omitted variables. This concern is particularly severe given that unobservable firm-level attributes—such as managerial ability, investment opportunities, etc.—are likely to drive both a firm's long-term orientation and performance. In a nutshell, while empirically challenging, exploiting a research design that provides a clean causal estimate is essential to understanding the impact of companies' temporal orientation on performance.

In this study, we attempt to overcome both obstacles. Specifically, we exploit a quasi-natural experiment provided by exogenous changes in long-term executive compensation. The objective of long-term executive compensation is to focus executives' effort on creating long-term value, thus fostering organizational long-term orientation (e.g., Cheng, 2004; Kole, 1997). To obtain exogenous changes in long-term compensation, we examine shareholder proposals advocating the use of long-term executive compensation that pass or fail by a small margin of votes at shareholder meetings. Intuitively,

there should be no systematic difference between companies that marginally pass long-term compensation proposals with, say, 50.1 percent of the votes and companies that reject comparable proposals with 49.9 percent of the votes. The passage of such "close call" proposals is akin to a random assignment of long-term incentives to companies and therefore provides a quasi-experimental setting to measure the causal effect of a long-term orientation on firm performance. In the economics literature, this approach of comparing outcomes just above and below a discontinuous threshold is known as "regression discontinuity design" (RDD). In this article, the discontinuity arises because a minor difference in vote shares around the majority threshold leads to a discrete change (that is, a discontinuity) in the adoption of long-term compensation policies.<sup>1</sup>

Using this RDD approach, we find that the passage of long-term compensation proposals leads to a significant increase in shareholder value. In particular, on the day of the shareholder meeting, a proposal that marginally passes yields an abnormal return of 1.14 percent compared to a proposal that is marginally rejected. This evidence is consistent with the view that a long-term orientation is value-enhancing.

We further examine the effect of passing long-term incentive proposals on operating performance. Specifically, we consider three measures of operating performance (return on assets, net profit margin, and sales growth). Regardless of the measure, we consistently find that operating performance increases in the long run. Interestingly, operating performance decreases slightly in the short run (i.e., in the year following the vote), indicating that an increased long-term orientation may take some time to materialize into higher profits. Arguably, this evidence suggests that managers channel more resources toward long-term projects that are costly in the short run, but pay off in the long run.

To further explore this mechanism, we examine directly whether companies adopting long-term compensation proposals are more likely to increase their investments in long-term strategies such as innovation and stakeholder relationships. We find

<sup>1</sup> For a survey of RDD applications, see Lee and Lemieux (2010). The RDD methodology is often seen as the sharpest tool of causal inference since it approximates very closely the ideal setting of randomized control experiments (see Lee and Lemieux, 2010: 282).

that they do. First, we observe an increase in R&D expenditures following the vote. We further document an increase in (1) the number of patents, (2) the number of citations per patents, and (3) the share of “riskier” patents, that is, patents that are in the tails of the distribution (“hits and flops”), and patents that are explorative rather than exploitative. This evidence indicates that long-term incentives are conducive to innovation and especially the pursuit of risky innovation projects. Second, we find that the KLD-index of social performance increases after the vote, suggesting that companies build up their social capital. The increase is especially strong for the employee and environment components of the KLD-index.

Our results are subject to the “internal versus external validity” tradeoff that often arises when using the RDD methodology. Indeed, while the RDD provides a clean causal estimate of the impact of long-term compensation proposals on firm outcomes, our results are conditional on being targeted by a long-term compensation proposal. When we benchmark these companies against other companies, we find that they are representative of the broader universe of companies with activist shareholders (essentially all large public firms in the U.S.), but not necessarily of the entire universe of U.S. public firms. Accordingly, one has to be careful in extrapolating our results to companies without activist shareholders.

## THEORY AND HYPOTHESES

### Intertemporal decision making in organizations

In business decisions, time horizons are of foremost importance. Companies need to balance short-term goals—such as short-term stock market performance and survival—with the development of capabilities that allow them to achieve a sustainable competitive advantage and long-term growth (e.g., Laverty, 1996, 2004).

The role of “time”—and how it shapes organizations and strategic decisions—has spurred a large literature in organization theory and strategy (surveys include Ancona *et al.*, 2001a; Ancona, Okhuyesen, and Perlow, 2001b; Bluedorn and Denhardt, 1988; Gavetti and Levinthal, 2000; Mosakowski and Earley, 2000; Ofori-Dankwa and Julian, 2001). Much of this literature explores how organizations conceptualize, experience, and manage time. For

example, organizations can differ in their temporal depth (short- versus long-term)—some organizations tend to plan far into the future, whereas others plan for much shorter time frames.

When short-term horizons compromise long-term returns, firms are labeled “short-termist” (e.g., Laverty, 1996). There is considerable empirical support for such short-termist behavior. For example, in the aforementioned survey of Graham *et al.* (2005), 78 percent of the surveyed executives stated that they would sacrifice projects with positive NPV if adopting them resulted in the firm missing quarterly earnings expectations. Similarly, DeGeorge, Patel, and Zeckhauser (1999) document that companies tend to boost short-term earnings when they are close to missing analysts’ expectations.

The tendency towards short-termism can be attributed to (1) myopic behavior at the individual level and (2) organizational conditions. A large literature in psychology and economics examines intertemporal decision-making at the *individual* level (e.g., Ainslie 1975; Frederick, Loewenstein, and O’Donoghue, 2002; Loewenstein and Prelec, 1992; O’Donoghue and Rabin, 1999; Thaler and Shefrin, 1981). A common theme in this literature is that individuals are “hyperbolic discounters,” preferring short-term rewards over long-term rewards, even if the latter are substantially higher. In the management context, the preference for short-term results is reinforced by short-term market pressure as well as managers’ incentives to “look good in the short run.” In particular, career concerns (e.g., Gibbons and Murphy, 1992), short-term compensation (e.g., Stein, 1988), and market pressure to meet or exceed analysts’ earnings forecasts (e.g., DeGeorge *et al.*, 1999) lead managers to favor projects that pay off in the short run at the expense of long-term projects (e.g., Stein, 1988).

Less research on temporal orientation has been undertaken at the *organizational* level. Yet, some evidence suggests that organizational conditions can also result in a preference for short-term returns. For example, Souder and Shaver (2010) find that organizations facing cash constraints are less likely to invest in long-term projects. This finding is intuitive, as long-term investments often bind substantial resources and cash-constrained firms will want to free up cash earlier than later. Similarly, Wang and Bansal (2012) argue that new ventures are less likely to invest in long-term initiatives (such as

corporate social responsibility) because they are looking for short-term results.

### Long-term incentives and firm value

Companies can foster a long-term orientation by providing long-term incentives to their management team (e.g., by linking their compensation to long-term performance). In the following, we argue that long-term incentives are value-enhancing.

The provision of long-term incentives helps alleviate managers' propensity to focus on short-term earnings. Indeed, as discussed in the previous section, a large literature argues that managers are myopic and make short-term investments in order to meet or beat short-term performance targets (e.g., Holmstrom, 1999; Porter, 1992; Stein, 1988, 1989), even if these projects are less valuable than long-term projects. Such short-termist behavior translates in lower firm value, as managers turn down valuable investment opportunities.

To illustrate, let us consider a positive NPV project that has short-term costs but high expected long-run benefits (e.g., an ambitious R&D project in a new-to-the-firm technological field). Short-termist managers—say, managers whose only concern is to report positive earnings in the short run (e.g., due to career concerns)—will reject this project. They fully discount the long-run benefits, and instead only consider the short-term costs in their decision-making. In contrast, shareholders ascribe a positive NPV to this project and hence would be better off with this project. By turning down this project, short-termist managers fail to maximize firm value, and hence hurt shareholders.

The underlying assumption is that the shareholders' discount rates are lower than managers'. Or simply put, managers have a stronger preference for the present compared to shareholders—in line with the survey evidence of Graham *et al.* (2005). This misalignment of discount rates is a form of agency problem, i.e., managers' time preferences are misaligned with those of the shareholders and, as a result, managers do not act in shareholders' best interests.

Shareholders can address this temporal misalignment by providing long-term incentives to their managers. In particular, by indexing managers' compensation to long-term payoffs, shareholders can realign managers' time preferences with theirs. This, in turn, would reduce managers' tendency to turn down valuable long-term projects, and hence

increase firm value. This leads to the following hypothesis:

*Hypothesis 1a: An exogenous increase in executives' long-term incentives leads to an increase in firm value.*

The above arguments imply that firm value increases due to an increase in long-term profits—as managers are incentivized to invest in (superior) projects with long-term payoffs.<sup>2</sup> Hence, we expect operating performance to increase in the long run:

*Hypothesis 1b: An exogenous increase in executives' long-term incentives leads to an increase in long-term operating performance.*

Note that the increase in operating performance need not materialize in the short run. Indeed, as the above example highlights, value-enhancing projects can entail a temporal separation between (short-term) cost and (long-term) benefits.<sup>3</sup>

Naturally, the alternative hypothesis is that an increase in long-term incentives leads to a decrease (or no change) in firm value. Several arguments would point to this alternative hypothesis. First, it could be that shareholders discount the future more than managers. In this case, the adoption of long-term incentives would be value-decreasing, as managers are incentivized to invest in projects that shareholders perceive as being less valuable. Second, short-term strategies may be inherently superior to long-term strategies. In this case, long-term incentives would encourage the pursuit of inferior strategies and hence hurt firm value. Third, the pursuit of long-term projects may increase operational risk by binding resources in the long run. For example, fixing an R&D budget for the next five years may prove suboptimal if future shocks call for changes in the optimal annual expenditures that cannot be attained without costly

<sup>2</sup> Formally, firm value  $V$  is the sum of the discounted expected future cash flows, i.e.,  $V = \sum_t \left( \frac{1}{1+r} \right)^t \times E(C_t)$ , where  $r$  is shareholders' discount rate and  $C_t$  is the firm's cash flow at time  $t$ . Mechanically, an increase in long-term cash flows increases  $V$  (provided it outweighs a potential decrease in short-term cash flows, and all else being equal).

<sup>3</sup> In the empirical analysis, we explicitly distinguish between the short- and long-term impacts on operating performance.



departures from the committed budget.<sup>4</sup> Fourth, long-term incentives may shift managers' attention from some stakeholders (e.g., consumers) to others (e.g., environment), which could potentially decrease firm value. For example, increased investments in green technologies may induce higher production costs that translate in higher prices, a decline in consumer demand, and ultimately a decrease in profits. If any of these negative forces prevail, we should observe a negative impact of long-term incentives on firm value.

### Long-term corporate strategies

In the previous section, we argued that taking a longer-term orientation—induced by the use of long-term incentives—is value-enhancing and improves long-term operating performance. In this section, we discuss potential mechanisms through which companies may benefit from a long-term orientation.

#### Innovation

Innovative activities are characterized by long gestation periods and a high rate of failure (e.g., Aghion and Tirole, 1994; Griliches, 1990; Hall, Jaffe, and Trajtenberg, 2005; Holmstrom, 1989). Given these inherent features of innovation, prior research argues that a long-term orientation is important for innovation (e.g., Azoulay, Graff Zivin, and Manso, 2011; Cheng, 2004). Several empirical findings support this argument. In particular, Aghion, Van Reenen, and Zingales (2013) find that companies with a higher fraction of institutional shareholders—i.e., shareholders with a longer time horizon—are more innovative. Lerner and Wulf (2007) find that companies with centralized R&D labs whose R&D heads are offered greater long-term compensation tend to produce more patents and more heavily cited patents. Azoulay *et al.* (2011) find that scientists produce more innovative research when they receive grants with long-term horizons.

In line with these arguments, we expect that executives' long-term incentives are conducive to

the pursuit of innovation. Indeed, if short-termism prevails, executives may refrain from investing in innovation, preferring to focus on projects that pay off sooner and have more predictable outcomes. This leads to the following hypothesis:

*Hypothesis 2a: An exogenous increase in executives' long-term incentives leads to increased investments in innovation.*

Long-term incentives may also affect the *type* of innovation. In particular, adopting a longer time horizon may be conducive to more explorative research (i.e., research in new-to-the-firm technological fields), which is characterized by longer gestation periods, higher uncertainty, and more diffuse outcomes than exploitative research (e.g., March, 1991). Moreover, longer time horizons may promote tolerance for failure, which is often argued to foster the pursuit of risky innovation projects. For example, Azoulay *et al.* (2011) suggest that greater job security leads to more innovations that are either “hits” or “flops” (i.e., more hits but also more failures). In this vein, long-term incentives may provide an insurance-like effect, encouraging managers to pursue R&D projects that are riskier and explorative (rather than exploitative).<sup>5</sup>

#### Stakeholder relationships

Furthermore, long-term horizons are important to establish and strengthen relationships with the company's stakeholders (e.g., employees, customers, community, etc.). Repeated interactions help develop relationships, empathy, and trust. The payoffs from these deeper stakeholder relationships take time to materialize as firms acquire intangible resources such as legitimacy and reputation (e.g., Hart, 1995; Jones, 1995; Porter and Kramer, 2006, 2011; Russo and Fouts, 1997; Wang and Bansal, 2012), which contribute to organizational survival and competitive advantage in the long run (e.g., Barney and Hansen, 1994; Hillman and Keim, 2001; Ortiz-de-Mandojana and Bansal, 2016; Teece, 1998). Accordingly, to the extent that stakeholder relationships contribute to long-term value creation (e.g., Edmans 2011, 2012; Flammer,

<sup>4</sup> For instance, assume that a firm optimizes  $x$  over two periods, with profits  $x_1 - \frac{1}{2}x_1^2 + \alpha(x_2 - \frac{1}{2}x_2^2)$ , where  $\alpha$  is a shock in the second period. A long-term orientation may commit  $x_1$  and  $x_2$  based on the expected  $\alpha$ , while a short-term orientation may optimize  $x_2$  based on the realization of  $\alpha$ , which yields superior profits over the two periods.

<sup>5</sup> In auxiliary analyses, we use patent data to characterize the type of innovation that companies pursue following a shift in long-term incentives.

2013, 2015), the provision of long-term incentives may foster firms' engagement in stakeholder relationships.

*Hypothesis 2b: An exogenous increase in executives' long-term incentives leads to increased engagement in stakeholder relations.*

This prediction need not apply to all stakeholder groups. Indeed, the positive relationship may be stronger for some, weaker (or perhaps even negative) for others, as (1) a shift in time horizon may be more relevant for some stakeholder initiatives than others, (2) the relationship between stakeholder relations and firm value may differ across stakeholder groups, and (3) stakeholder interests may collide. We discuss each in more detail below.

First, an increase in managers' time horizon may be more relevant for some stakeholder initiatives. For example, firms often provide financial and in-kind assistance to communities such as donating to charities or offering disaster relief (e.g., Kaniasty and Norris, 2004; Tilcsik and Marquis, 2013). The decision to engage in such assistance is unlikely to be sensitive to the provision of long-term incentives.<sup>6</sup> In contrast, a longer time horizon may induce managers to devote more attention to their employees and invest in the development of their human capital and well-being. For example, training, career development, work-life balance, health benefits, etc., are all investments whose benefits accrue over time and hence are likely sensitive to the adoption of a long-term orientation. Finally, an increase in time horizon may influence managers' awareness of climate change risks and hence lead to greater consideration of the natural environment in decision-making.<sup>7</sup>

<sup>6</sup> Similarly, an increase in time horizon is unlikely to change managers' decision to provide free products and services to economically disadvantaged consumers, nor change their attention to paying customers. Indeed, given customers' salience to firms (Mitchell, Agle, and Wood, 1997), managers are likely to meet customers' claims regardless of their time orientation.

<sup>7</sup> Recent studies (e.g., Risky Business, 2014) highlight that rising sea levels and increased storm surge are expected to damage coastal property and infrastructure, higher temperatures to decrease labor productivity and public health, extreme temperatures to increase energy demand, etc. Hence, climate change represents an increasing economic risk for companies and bears potentially severe losses for investors. Investors are increasingly aware of this risk and perceive a shift towards more eco-friendly corporate behavior to be value-enhancing (Ernst & Young, 2015; Flammer, 2013). In this vein, Novo Nordisk's CEO Lars Rebien Sørensen argues that "in the long term, social and environmental issues become financial issues" (*Harvard Business Review*, 2015).

Second, the relationship between stakeholder relations and firm value may vary across stakeholder groups. While a large body of literature suggests a positive association between overall stakeholder engagement and financial performance (for detailed reviews of this literature, see, e.g., Margolis, Elfenbein, and Walsh, 2007; Orlitzky, Schmidt, and Rynes, 2003), for some stakeholder groups it remains unclear whether stakeholder engagement leads to long-term benefits. For other stakeholder groups, such as employees and the natural environment, several studies do report performance benefits. Specifically, by catering to the interests and needs of employees, firms can improve their labor productivity (Flammer, 2015; Flammer and Luo, 2017), innovative productivity (Flammer and Kacperczyk, 2016), and long-term value creation (e.g., Edmans 2011, 2012). Relatedly, several studies show that a shift toward more eco-friendly corporate behavior is value-enhancing (e.g., Flammer, 2013; Hamilton, 1995; Klassen and McLaughlin, 1996). By improving their environmental footprint, companies can benefit from a better reputation and cleaner work environment, improving the satisfaction of employees and consumers (e.g., Bansal and Roth, 2000; Hart, 1995; Russo and Fouts, 1997).

Lastly, stakeholders' interests can collide. For example, while the overall net benefits of improving employee relations are positive and benefit shareholders (see, e.g., Edmans 2011, 2012), it may be at the expense of other stakeholder groups, such as consumers (e.g., through higher prices).

In sum, while we hypothesize a positive relationship between long-term incentives and firms' overall engagement in stakeholder relationships, there might be considerable heterogeneity across the different stakeholder groups. In the empirical analysis, we explore this heterogeneity by separately studying the various stakeholder groups.

## DATA AND METHODOLOGY

### Data and variable definitions

To study the effect of long-term incentives on company outcomes (e.g., firm value, operating performance, R&D, stakeholder relationships), we examine shareholder proposals on long-term executive compensation that pass or fail by a small margin of votes. Long-term compensation rewards executives

(i.e., CEO, CFO, COO, as well as other senior executives) for their long-term performance, incentivizing them to adopt long-term horizons (e.g., Cheng, 2004; Kole, 1997). In this section, we describe the shareholder proposals as well as the other variables used in the empirical analysis.

#### *Shareholder proposals on long-term executive compensation*

The data on shareholder proposals are obtained from RiskMetrics and SharkRepellent. RiskMetrics includes shareholder proposals that came to a vote from 1997 to 2011 at S&P 1500 companies as well as approximately 400–500 additional widely held companies. Shark Repellent's proxy voting database covers shareholder proposals of about 4,000 large public companies from 2005 to 2012. Both databases include firm identifiers, a description of the proposal, the date of the annual meeting, the proposal's sponsor, the voting requirement, and the outcome of the vote.

We merge both databases to obtain a comprehensive dataset of shareholder proposals that came to a vote between 1997 and 2012. To identify shareholder proposals on long-term executive compensation, we proceed as follows. First, we restrict the sample to proposals related to executive compensation (subcategory "executive compensation related" in SharkRepellent; all resolution types pertaining to executive pay in RiskMetrics). We then read the proposal and support statement of each proposal to identify whether the proposal advocates the use of long-term executive compensation. There are three main tools of long-term executive compensation (see Burns and Kedia, 2006): (1) restricted stocks (i.e., the award of stocks that cannot be sold in the short run), (2) restricted stock options (i.e., the award of stock options that cannot be exercised in the short run), and (3) LTIP (long-term incentive plans). LTIPs are comprehensive reward systems designed to incentivize executives over a long-term period. Most LTIPs consist of conditional company shares, which are distributed in two parts. The first part represents an immediate distribution of half of the shares, while the second half will only be awarded to the executive in a predefined number of years if the executive has met specific long-term goals.

Our search returns a final sample of 808 shareholder proposals related to long-term executive compensation. For example, on February 16,

2005, the shareholders of Lucent Technologies (a telecommunications equipment company based in Murray Hill, NJ) voted on a proposal to adopt a compensation policy with a greater reliance on long-term equity-based compensation. In the support statement of the proposal, Lucent's shareholders stated: "As long-term shareholders, we support compensation policies for senior executives that provide challenging performance objectives that motivate executives to achieve long-term shareholder value" (SEC Form DEF 14A, filed by Lucent Technologies, Inc. on January 3, 2005). This proposal was marginally approved with a vote share of 50.1 percent. Hence, this proposal is an example of what we refer to as "close call" (see below).

The majority of shareholder proposals on long-term executive compensation are rejected at annual meetings. Figure 1 provides the histogram of the vote outcome of the 808 proposals. As is shown, about 55 percent of the proposals receive less than 30 percent of favorable votes. This pattern is similar to the vote outcome of other shareholder proposals, such as say-on-pay proposals (Cuñat, Giné, and Guadalupe, 2015) and proposals on corporate social responsibility (Flammer, 2015). This suggests that the majority of shareholder proposals may be symbolic in nature, that is, shareholders submit them not necessarily because they expect them to pass, but rather to bring specific issues to the attention of management and the public.

To obtain a *causal* estimate of the impact of long-term compensation proposals on firm value, our identification strategy relies on proposals with a "close call" outcome. A total of 65 proposals received a vote share within the  $[-5\%, +5\%]$  interval around the majority threshold, and 152 within the  $[-10\%, +10\%]$  interval. While the number of close call proposals may seem small relative to the total number of proposals, it is sufficiently large in absolute terms to lend power to our identification (see the methodology section).

#### *Dependent variables*

**Abnormal returns.** Our main dependent variable is the abnormal return on the day of the shareholder meeting ( $t=0$ ). Abnormal returns provide an estimate of the impact of passing a long-term compensation proposal on shareholder value, and hence capture all potential channels through which a long-term orientation benefits shareholders.

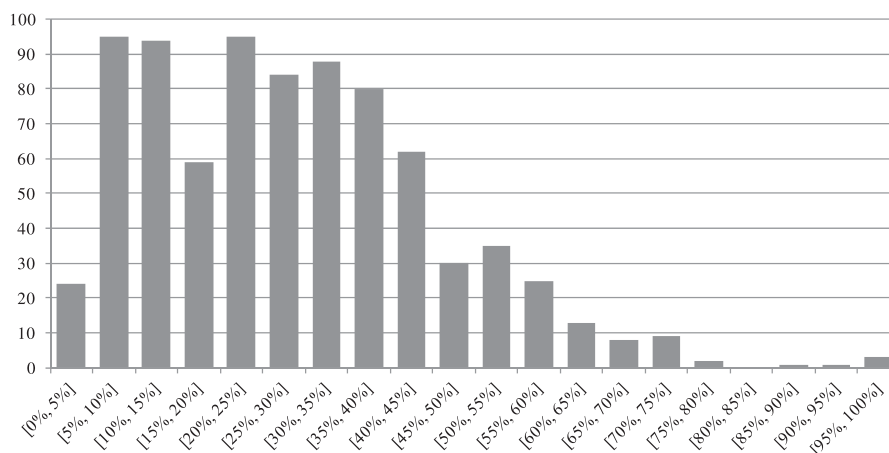


Figure 1. Distribution of votes for shareholder proposals on long-term executive compensation.

Notes. This figure presents the histogram of the vote shares in favor of long-term executive compensation proposals. The horizontal axis indicates the vote share in 5% intervals. The vertical axis indicates the frequency of proposals.

Following Cuñat, Giné, and Guadalupe (2012) and Flammer (2015), we compute abnormal returns using the four-factor model of Carhart (1997).<sup>8</sup>

**Operating performance.** We consider three measures of operating performance: return on assets (ROA), net profit margin (NPM), and sales growth. All three measures are obtained from Standard & Poor's Compustat. *ROA* is the ratio of operating income before depreciation to the book value of assets. *NPM* is the ratio of operating income before depreciation to sales. *Sales growth* is the growth in sales from one fiscal year to the next. To mitigate the impact of outliers, all three measures are winsorized at the 5th and 95th percentiles of their empirical distribution.

**Innovation.** To measure investments in innovation, we use *R&D expenditures*, computed as the ratio of R&D expenses to total assets (from Compustat). We winsorize this ratio at the 5th and 95th

percentiles of its empirical distribution. In auxiliary analysis, we further use patent-based metrics to measure innovation outcomes.

**Stakeholder relationships.** To measure stakeholder relationships, we use the *KLD-index*. This index is obtained from the Kinder, Lydenberg, and Domini (KLD) database. KLD is a social choice investment advisory firm that relies on independent rating experts to assess how well companies address the needs of their stakeholders based on multiple data sources including annual questionnaires sent to companies' investor relations offices, firms' financial statements, annual and quarterly reports, general press releases, government surveys, and academic publications. The composite KLD-index is constructed by adding up the number of KLD strengths along the following dimensions: employees, customers, the natural environment, and society at large (community and minorities). In auxiliary analysis, we further decompose the KLD-index into four subindices corresponding to each of these dimensions.

#### Firm characteristics

**Financing constraints.** To measure financing constraints, we use the *KZ-index* of Kaplan and Zingales (1997). This index is a linear combination of several Compustat items that capture the difficulty of raising resources to finance new projects. The computation of the KZ-index is described in Lamont, Polk, and Saa-Requejo (2001: 551–552).

<sup>8</sup> The four factors are the market return RMRF (the return on the market portfolio minus the risk-free rate), the size factor SMB ("small minus big"), the book-to-market factor HML ("high minus low") and the momentum factor UMD ("up minus down"). In robustness checks, we show that our results are robust if we compute abnormal returns using the market model (i.e., if we only use the market factor RMRF). We obtain the daily stock return data from the Center for Research in Security Prices (CRSP). The four factors are obtained from Kenneth French's website. We estimate the coefficients of the four-factor model by OLS using an estimation period of 200 trading days that starts 20 trading days prior to the shareholder meeting. To be included in the sample, a stock needs to have at least 15 days with non-missing returns during the 200-day estimation period.



*Executive compensation.* Compensation data are obtained from Standard & Poor's Execucomp. *Total CEO compensation* is the total amount of compensation received by the CEO. *Long-term CEO compensation* is the amount of compensation that is received in the form of restricted shares, restricted stock options, and LTIP (long-term incentive plan) payouts (for a similar definition see, e.g., Aggarwal, 2008).

*Long-term index.* Slawinski and Bansal (2012) argue that an organization's time orientation is reflected by its discourse. In this spirit, we construct an index of long-term orientation based on the organization's discourse. We label this index *LT-index*. To construct this index, we conduct a textual analysis of the firms' 10-K filings, which we obtain from the Securities and Exchange Commission's (SEC) EDGAR database. Specifically, we count the number of keywords referring to the short term ("short run," "short-run," "short term," "short-term") and long term ("long run," "long-run," "long term," "long-term"), respectively. We then compute the LT-index as the ratio of the number of long-term keywords to the sum of long- and short-term keywords. Arguably, companies that use long-term keywords more frequently in their discourse are more likely to have a longer-term orientation.

*Accounting variables.* Accounting variables are obtained from Compustat. *Market value* is the number of shares outstanding multiplied by the stock price. *Total assets* is the book value of total assets. *Capital expenditures* is the ratio of capital expenditures to total assets. *Tobin's Q* is the ratio of the market value of total assets (computed as the book value of total assets plus the market value of equity minus the sum of the book value of equity plus deferred taxes and investment tax credit) to the book value of total assets. *Leverage* is the ratio of debt in current liabilities and long-term debt to total assets. To mitigate the impact of outliers, all ratios are winsorized at the 5th and 95th percentiles of their empirical distribution.

*Corporate governance.* To measure corporate governance, we use the *G-index* of Gompers, Ishii, and Metrick (2003). This index adds one index point for each of 24 (anti-) governance provisions. We obtain the G-index from RiskMetrics. It is available for the years 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006. To fill in the missing

years, we use the latest available value of the index.

*Institutional ownership.* Lastly, we measure institutional ownership as the percentage of shares owned by institutional investors in the quarter that ends prior to the date of the shareholder meeting. The data on institutional ownership are obtained from Thomson-Reuters institutional holdings (13F) database.

### Summary statistics

Table 1 provides summary statistics for all variables described in this section. The sample consists of the 808 long-term compensation proposals. Abnormal returns are computed on the day preceding the shareholder meeting. All other variables are computed in the fiscal year that ends prior to the meeting (except for the KLD- and G-index which are computed in the calendar year preceding the meeting, and institutional ownership which is measured at the end of the quarter preceding the meeting).

### Methodology

To estimate the effect of long-term compensation proposals on firm value (and other firm-level outcomes), we use a regression discontinuity design (RDD). Our methodology follows very closely the methodology of Cuñat *et al.* (2012) who study the effect of governance proposals on firm value.

The objective is to estimate the effect of passing a long-term compensation proposal on an outcome variable for firm  $i$  at time  $t$ , denoted by  $y_{it}$  (e.g., the stock market reaction on the day of the shareholder meeting). The proposal receives a vote share  $v_{it}$ . Whether or not the proposal is approved is denoted by the indicator variable  $\text{Pass}_{it} = 1(v_{it} \geq v^*)$ , where  $v^*$  is the majority threshold.<sup>9</sup> To estimate the effect of adopting a long-term compensation proposal, one could estimate the following regression:

$$y_{it} = \alpha + \beta \times \text{Pass}_{it} + \varepsilon_{it},$$

where  $\beta$  measures the effect of passing a long-term compensation proposal on  $y_{it}$ , and  $\varepsilon_{it}$  is the error

<sup>9</sup> The threshold  $v^*$  is 50% for most companies. In the few cases where companies have a stricter majority requirement (e.g., a "supermajority" requirement of two-thirds of the votes), we adjust  $v^*$  accordingly.

Table 1. Summary statistics

	N	Mean	Median	Std. dev.	25th Percentile	75th Percentile
Abnormal return on meeting day	808	0.001	0.000	0.022	−0.008	0.010
Market value (\$ billion)	808	37.876	14.226	61.910	4.546	40.446
Total assets (\$ billion)	808	109.156	22.021	309.388	7.698	48.343
Total CEO compensation (\$ million)	779	13.217	9.398	15.695	4.486	16.364
Long-term CEO compensation (\$ million)	779	4.327	0.000	8.494	0.000	5.746
LT-index	808	0.749	0.749	0.138	0.669	0.846
Capital expenditures	789	0.046	0.036	0.042	0.017	0.064
R&D expenditures	398	0.039	0.023	0.049	0.002	0.061
ROA	789	0.113	0.112	0.087	0.066	0.165
NPM	789	0.190	0.173	0.187	0.096	0.301
Sales growth	805	0.070	0.056	0.201	−0.014	0.127
Tobin's Q	679	1.666	1.357	0.909	1.070	1.871
Leverage	806	0.288	0.265	0.164	0.172	0.398
KZ-index	641	0.164	0.399	0.705	0.161	0.505
KLD-index	745	4.479	3.000	3.821	1.000	7.000
G-index	764	8.988	9.000	2.358	7.000	11.000
Institutional ownership (%)	778	68.505	71.502	21.310	59.543	83.252

term. However, a concern with this regression is that the passing of a long-term compensation proposal may be correlated with unobservable firm characteristics that may also influence  $y_{it}$  (e.g., corporate culture, shareholder power, expected performance, etc.). In this case, the identifying assumption is violated ( $E[\text{Pass}_{it} \times \varepsilon_{it}] \neq 0$ ) and the estimate of  $\beta$  will be inconsistent.

To obtain a consistent estimate of  $\beta$ , we would ideally need a randomized assignment of “passing a long-term compensation proposal” to companies. The regression discontinuity design (RDD) is helpful in approximating this ideal setting, since it relies on proposals that pass or fail by a narrow margin of votes. Arguably, whether a proposal passes with 50.1 percent of the votes, or fails with 49.9 percent is as good as random. Hence, such close call proposals provide a source of random variation in the adoption of long-term compensation proposals, which can be used to obtain a consistent estimate of  $\beta$ .

The RDD can be implemented by estimating the difference in average  $y_{it}$  between proposals that pass or fail by a small margin of votes. While this difference does provide an unbiased estimate of  $\beta$ , it comes at the cost of discarding all non-close proposals. A more efficient estimate of  $\beta$  can be obtained by using all proposals and approximating the continuous relationship between  $y_{it}$  and  $v_{it}$  with a polynomial in  $v_{it}$ , allowing for a discontinuous jump at the majority threshold  $v^*$ . Following Cuna

*et al.* (2012), we allow for a different polynomial for observations on the left-hand side of the threshold  $P_l(v_{it}, \gamma_l)$  and on the right-hand side of the threshold  $P_r(v_{it}, \gamma_r)$ . The RDD specification can be written as follows:

$$y_{it} = \beta \times \text{Pass}_{it} + P_l(v_{it}, \gamma_l) + P_r(v_{it}, \gamma_r) + \varepsilon_{it}. \quad (1)$$

The estimate of  $\beta$  captures the discontinuity at the majority threshold, and hence provides a consistent estimate of the causal effect of passing a long-term compensation proposal on  $y_{it}$ . We cluster standard errors at the firm level. Throughout the article, we use polynomials of order three on both sides of the majority threshold. The results are similar if second- or fourth-order polynomials are used instead.

Note that  $\beta$  measures the effect of *approving* a long-term compensation proposal as opposed to the effect of *implementing* such proposal, due the non-binding nature of shareholder proposals (i.e., the board is not formally required to implement a proposal that has been approved). Nevertheless, this non-binding feature is not a concern for our analysis since it only goes against us finding any results. Moreover, while we do not observe whether a proposal is implemented, in auxiliary analysis we show that both long-term CEO compensation as well as the LT-index increase significantly following the vote. This indicates that adopting long-term compensation proposals does lead

to substantial increases in long-term compensation and organizational long-term orientation.

### Randomization tests

The identifying assumption of the RDD is that, around the majority threshold, the outcome of the vote is as good as random. In this section, we provide standard tests of this assumption. In particular, we examine (1) whether the distribution of the votes is continuous around the majority threshold, and (2) whether significant differences exist between companies that marginally pass and reject long-term compensation proposals.

#### *Continuity in the distribution of shareholder votes*

First, we visually inspect whether there is a discontinuous jump in the distribution of shareholder votes around the majority threshold. Such discontinuity would be indicative of a non-random assignment of “pass” versus “fail” on either side of the threshold. A visual inspection of the histogram in Figure 1 suggests that the distribution is indeed smooth and continuous around the threshold. More formally, in Figure A1 in Appendix S1, we conduct the McCrary (2008) test of continuity in the density function around the threshold. As is shown, there is no evidence for a discontinuous jump. The null of continuity of the density function at the threshold cannot be rejected at all conventional significance levels ( $p$ -value = 0.997).<sup>10</sup>

#### *Pre-existing differences between companies around the discontinuity*

Second, we examine whether companies that are marginally below and above the majority threshold are similar on the basis of *ex ante* characteristics. If the outcome of close call compensation proposals is truly random, we should not observe any pre-existing difference between companies on either side of the threshold.

In Table 2, we examine whether there are any pre-existing differences. We consider all

characteristics listed in Table 1 in the year preceding the shareholder meeting (for the abnormal returns, we consider the day preceding the meeting). In column (1), we report the difference-in-means across all proposals. In columns (2) and (3), we compute the difference-in-means across the close call proposals ( $\pm 10\%$  and  $\pm 5\%$ , respectively). Finally, in column (4), we report the difference at the threshold using the RDD specification in Equation (1).

As is shown in column (1), companies that pass a long-term compensation proposal differ significantly from companies that reject it. More importantly, we see in columns (2)–(4) that these differences disappear at the majority threshold. In Figure A2 in Appendix S1, we further plot each covariate against the victory margin and find no evidence for a discontinuity at the threshold. Finally, in Table A1 in Appendix S1, we repeat this analysis, but instead of looking at the covariates at  $t - 1$ , we examine the change in these covariates from  $t - 2$  to  $t - 1$  (i.e., the pre-trend). Again, we find no significant difference at the threshold. Overall, the analysis presented in this section lends strong support to our identifying assumption.

## RESULTS

### The effect of long-term compensation proposals on firm value

#### *Graphical analysis*

To estimate the effect of passing long-term compensation proposals on firm value, we examine the stock market reaction on the day of the shareholder meeting. Figure 2 plots abnormal returns against the victory margin. Each dot in the figure represents the average abnormal return in two-percent bins of vote share. The solid line represents the predicted values of abnormal returns from third-order polynomials in vote share estimated separately on either side of the majority threshold.

As is shown, abnormal returns seem to be a continuous and smooth function of the vote share everywhere except at the majority threshold where there is a discontinuous jump. This suggests that long-term compensation proposals that are marginally approved lead to an increase in firm value compared to proposals that are marginally rejected. Interestingly, as we move away from the threshold, abnormal returns appear to converge

<sup>10</sup> The continuous distribution of shareholder votes around the majority threshold is in line with what has been documented for other types of shareholder-sponsored proposals (Cunat *et al.*, 2012, 2015; Flammer, 2015). This is in sharp contrast to *management*-sponsored proposals, which typically exhibit a discontinuity at the majority threshold since managers tend to strategically withdraw proposals that are expected to fail (Listokin, 2008).

Table 2. Pre-existing differences as a function of the vote outcome

	Before meeting ( $t - 1$ )			RDD estimate (full model) (4)
	Diff-in-means (all proposals) (1)	Diff-in-means [−10%, +10%] (2)	Diff-in-means [−5%, +5%] (3)	
Abnormal return	0.000 (0.002)	0.000 (0.004)	0.001 (0.008)	0.003 (0.005)
Log(market value)	−0.533 (0.183)	−0.263 (0.304)	−0.070 (0.539)	−0.207 (0.356)
Log(total assets)	−0.491 (0.192)	−0.219 (0.318)	0.106 (0.532)	0.087 (0.374)
Log(total CEO compensation)	0.220 (0.192)	0.067 (0.187)	0.088 (0.299)	0.254 (0.374)
Log(long-term CEO compensation)	0.282 (0.850)	0.520 (1.252)	0.339 (1.993)	0.459 (1.623)
LT-index	−0.016 (0.016)	0.010 (0.024)	0.023 (0.034)	0.047 (0.031)
Capital expenditures	−0.004 (0.005)	0.001 (0.007)	0.008 (0.012)	0.004 (0.008)
R&D expenditures	0.005 (0.007)	−0.001 (0.012)	−0.002 (0.017)	−0.001 (0.014)
ROA	−0.007 (0.010)	−0.002 (0.013)	−0.001 (0.019)	−0.001 (0.018)
NPM	−0.002 (0.021)	−0.002 (0.025)	0.005 (0.037)	0.002 (0.040)
Sales growth	0.007 (0.022)	−0.001 (0.030)	−0.002 (0.051)	−0.004 (0.043)
Tobin's Q	−0.199 (0.107)	−0.106 (0.135)	−0.122 (0.140)	−0.176 (0.213)
Leverage	−0.008 (0.018)	0.002 (0.026)	0.005 (0.039)	0.007 (0.034)
KZ-index	0.022 (0.087)	0.117 (0.121)	0.157 (0.209)	0.211 (0.174)
KLD-index	−0.949 (0.428)	−0.393 (0.701)	0.126 (0.982)	0.122 (0.843)
G-index	0.675 (0.262)	0.342 (0.403)	0.446 (0.627)	0.661 (0.507)
Institutional ownership	6.769 (2.344)	1.331 (3.285)	3.977 (5.451)	3.109 (3.895)

Column (1) reports the difference-in-means among all firms in the sample; column (2) reports the difference-in-means among all firms with a proposal whose vote share lies within 10% of the majority threshold; column (3) reports the difference-in-means among all firms with a proposal whose vote share lies within 5% of the majority threshold; column (4) reports the difference at the majority threshold by estimating the RDD specification in Equation (1) including polynomials of order three on both sides of the threshold. Standard errors (reported in parentheses) are clustered at the firm level.

to zero. This pattern suggests that the market anticipates the outcome of non-close votes, and hence any value implication is already incorporated in stock prices.

### Regression analysis

The graphical analysis provided in Figure 2 suggests that the adoption of close call proposals on long-term executive compensation leads to an increase in firm value. To formally test this

hypothesis, we report in Table 3 estimates of the difference in abnormal returns between proposals that pass and proposals that fail for increasingly small intervals around the threshold.

Column (1) estimates this difference in the full sample of 808 proposals and shows that it is small and not statistically significant. This is due to the “non-close” proposals, i.e. proposals with a vote share that is more than 10 percent above or below the majority threshold. As can be seen in column (2), restricting the sample to non-close proposals



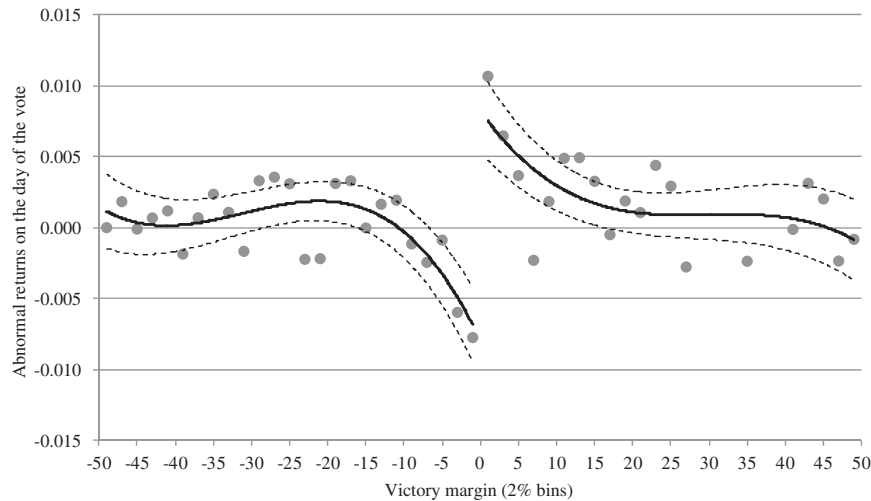


Figure 2. Abnormal returns on the day of the vote.

*Notes.* The vertical axis indicates abnormal returns on the day of the vote. The horizontal axis indicates the victory margin (i.e., the vote share minus the majority threshold). Each dot represents the average abnormal return in 2% bins of vote share. The solid line plots predicted values of abnormal returns from third-order polynomials in vote share estimated separately on either side of the majority threshold. The dashed lines represent one-standard deviation bounds.

Table 3. Abnormal returns around the majority threshold

	All votes (1)	Non close (2)	[−10%, +10%] (3)	[−5%, +5%] (4)	[−2.5%, +2.5%] (5)	Full model (6)
Pass	0.0039 (0.0025)	0.0033 (0.0029)	0.0068 (0.0041)	0.0142 (0.0066)	0.0228 (0.0134)	0.0114 (0.0039)
Polynomial in vote share	No	No	No	No	No	Yes
R-squared	0.004	0.000	0.019	0.064	0.055	0.013
Observations	808	656	152	65	19	808

“Non close” proposals are proposals with a vote share that is more than 10% above or below the majority threshold. Standard errors (reported in parentheses) are clustered at the firm level.

yields a difference in abnormal returns that is close to zero. This finding is in line with the pattern in Figure 2 suggesting that the market predicts the outcome of non-close proposals, and hence their effect is already impounded in stock prices prior to the vote.

In column (3), we restrict the sample to the 152 long-term compensation proposals with vote shares within 10 percent of the majority threshold. The difference in abnormal returns is 0.68 percent ( $p$ -value = 0.097). This difference is larger in columns (4) and (5), where the sample is further restricted to proposals with vote shares within 5 percent and 2.5 percent, respectively, of the majority threshold. Specifically, the difference in abnormal returns is 1.42 percent ( $p$  = 0.031) and 2.28 percent ( $p$  = 0.089), respectively. Overall,

the evidence in columns (3)–(5) suggests that long-term compensation proposals that are marginally approved lead to a significant increase in shareholder value compared to proposals that are marginally rejected.

Finally, in column (6), we estimate the specification given by Equation (1), using two polynomials of order three in the vote share on both sides of the majority threshold. In contrast to the non-parametric estimates in columns (3)–(5), this approach uses all 808 proposals. Hence, it provides a more efficient estimate of the effect of long-term compensation proposals at the discontinuity. As is shown, the coefficient on the pass dummy is 1.14 percent and it is highly significant ( $p$  = 0.004). Overall, the results provided in Table 3 are consistent with Hypothesis 1 stating that an exogenous

Table 4. The impact of long-term incentives on operating performance and corporate strategy

	Operating performance			Long-term strategies	
	ROA (1)	NPM (2)	Sales growth (3)	Innovation (R&D expenditures) (4)	Stakeholders (KLD-index) (5)
Year of vote, $t$	−0.0029 (0.0044)	−0.0015 (0.0091)	−0.0154 (0.0192)	0.0036 (0.0020)	0.292 (0.168)
One year later, $t + 1$	0.0042 (0.0046)	0.0077 (0.0093)	0.0149 (0.0198)	0.0049 (0.0020)	0.585 (0.171)
Years $t + 2$ to $t + 4$	0.0094 (0.0047)	0.0191 (0.0097)	0.0385 (0.0204)	0.0043 (0.0022)	0.631 (0.174)
Polynomial in vote share	Yes	Yes	Yes	Yes	Yes
R-squared	0.803	0.806	0.289	0.941	0.870
Observations	3,666	3,666	3,743	1,902	3,462

The regressions are estimated using the dynamic RDD specification of Cuñat *et al.* (2012) with firm-meeting fixed effects. Standard errors (reported in parentheses) are clustered at the firm level.

increase in long-term incentives leads to a positive stock market reaction. In Appendix A and Tables A2–A3 of Appendix S1, we show that this finding is robust to a large battery of robustness checks.

### Operating performance

In this section, we evaluate the impact of long-term compensation proposals on operating performance (e.g., ROA). To do so, we use a dynamic extension of the RDD specification in Equation (1) that estimates the effect of passing a close call long-term compensation proposal on a given outcome variable in the year of the vote ( $t$ ), the following year ( $t + 1$ ), and the subsequent three years (the average of the outcome variable from  $t + 2$  to  $t + 4$ ).<sup>11</sup>

We consider three measures of operating performance: ROA, NPM, and sales growth. The results are provided in columns (1)–(3) of Table 4.

As is shown, all three measures increase significantly after  $t + 2$ . ROA increases by 0.9 percentage points ( $p = 0.046$ ), NPM by 1.9 percentage points ( $p = 0.049$ ), and sales growth by 3.9 percentage points ( $p = 0.059$ ), suggesting that long-term incentives improve operating performance in the long run.<sup>12</sup> These findings are supportive of Hypothesis 1b. Interestingly, all three measures of operating performance actually *decrease* in the short run (albeit the decrease is not significant). This indicates that, following an increase in long-term incentives, firms engage in long-term investments that are costly in the short run, but pay off significantly in the long run.<sup>13</sup>

### Long-term strategies

In columns (4) and (5) of Table 4, we examine whether the passage of long-term compensation proposals leads to higher engagement in long-term strategies. Specifically, we examine two

<sup>11</sup> Instead of re-estimating Equation (1) separately for  $t$ ,  $t + 1$ , and  $t + 2$  to  $t + 4$ , we estimate all coefficients jointly using the dynamic RDD specification of Cuñat *et al.* (2012). The dynamics is accounted for by using a panel dataset in which, for each firm-meeting ( $i$ ,  $t$ ), observations at time  $t + \tau$  are pooled for multiple  $\tau$ , including  $\tau < 0$ . As in Cuñat *et al.* (2012), we pool observations from  $t - 2$  to  $t + 4$ . Accordingly, the years  $t - 1$  and  $t - 2$  are used as base period (i.e., the coefficients measure the *change* in the dependent variable compared to the base period, similar to a difference-in-differences specification in which the pass dummy is the treatment variable). The coefficient on the dummy for whether the proposal has passed  $\beta_\tau$  is then  $\tau$ -specific and is constrained to zero for  $\tau < 0$ . Since observations before and after the event are pooled together, an advantage of this specification is that we can include firm-meeting fixed effects. See Cuñat *et al.* (2012: 1956–1958) for details.

<sup>12</sup> In Figure A3 in Appendix S1, we plot all dependent variables shown in Table 4 against the victory margin. A visual inspection of these graphs confirms the presence of a sharp discontinuity at the threshold.

<sup>13</sup> Some of the effects of the long-term compensation proposals may be driven by managerial turnover. Indeed, managers may resign after the change in compensation policy and new managers may be hired. To examine whether this is the case, in column (1) of Table A5 in Appendix S1, we use as dependent variable a dummy variable equal to one if the CEO leaves the company. We obtain the data on CEO turnover from Execucomp. As can be seen, there is little evidence for managerial turnover following the vote. This suggests that the new compensation policy is targeted at existing executives as opposed to being a means of attracting different executives.

types of investments that are commonly considered long-term: innovation (R&D expenditures) and stakeholder relationships (KLD-index). As can be seen, both increase significantly following the vote. These findings are supportive of Hypotheses 2a and 2b, suggesting that companies channel more resources toward long-term strategies.<sup>14</sup>

## Auxiliary results

### Patenting

The results presented in the previous section indicate that companies that adopt long-term compensation proposals increase their R&D investments. In columns (1)–(8) of Table 5, we further examine patent-based metrics to measure innovation outcomes. Specifically, we obtain the patent data from the National Bureau of Economic Research (NBER) patent database, which contains annual information on patent assignee names, the number of patents, the number of citations, and the year of patent application. Since the NBER patent database ends in 2006, the sample used for this analysis is restricted accordingly. We further exclude non-patenting firms from the sample.

In column (1), the dependent variable is  $\log(\text{patents})$ , which is the logarithm of the number of patent applications filed in a year that are eventually granted.<sup>15</sup> As is shown, the number of patents increases significantly in the long run (i.e., years  $t + 2$  to  $t + 4$ ), suggesting that companies not only increase their R&D budgets, but also generate more innovative output. In column (2), we use citation-weighted patent counts in lieu of patent counts (e.g., Aghion *et al.*, 2013). The citation weights account for the fact that patents can vary

<sup>14</sup> Note that the documented increase in R&D and the KLD-index does not necessarily imply that they are the source of value creation. Indeed, our empirical framework only allows us to assess the causal effect of long-term incentives on performance, R&D, and the KLD-index, but does not speak to the causal relationship among those outcome variables.

<sup>15</sup> The number of patents is subject to a truncation problem, because patents appear in the NBER database only after they are granted, and the lag between patent applications and patent grants is about two years on average. Accordingly, as we approach the last few years of the database, the number of patent applications that are eventually granted decreases because many patent applications filed during these years were still under review and had not been granted by 2006. To correct for this truncation problem, we follow common practice (e.g., Hall *et al.*, 2001, 2005) and divide the patent count by the total number of patent applications in the same year.

Table 5. Patenting and stakeholder groups

	Patenting								Stakeholder groups			
	Log (patents) (1)	Log (citation-weighted) (2)	Log (citations/patents) (3)	Share of hits and flops (4)	Share of hits (5)	Share of flops (6)	Share of explorative patents (7)	Share of exploitative patents (8)	KLD-index employees (9)	KLD-index environment (10)	KLD-index consumers (11)	KLD-index society (12)
Year of vote, $t$	0.011 (0.011)	0.005 (0.009)	−0.004 (0.007)	0.008 (0.008)	0.004 (0.005)	0.005 (0.004)	−0.002 (0.020)	0.001 (0.018)	0.155 (0.123)	0.099 (0.074)	0.004 (0.027)	0.034 (0.051)
One year later, $t + 1$	0.018 (0.013)	0.015 (0.011)	0.010 (0.008)	0.009 (0.008)	0.006 (0.005)	0.003 (0.005)	0.016 (0.021)	−0.005 (0.021)	0.385 (0.126)	0.158 (0.076)	0.010 (0.027)	0.032 (0.052)
Years $t + 2$ to $t + 4$	0.032 (0.016)	0.045 (0.013)	0.024 (0.010)	0.021 (0.010)	0.012 (0.006)	0.009 (0.005)	0.047 (0.023)	−0.023 (0.025)	0.393 (0.128)	0.168 (0.077)	0.016 (0.028)	0.054 (0.052)
Polynomial in vote share	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.789	0.739	0.640	0.571	0.457	0.427	0.568	0.567	0.815	0.699	0.724	0.843
Observations	804	804	804	804	804	804	804	804	3,462	3,462	3,462	3,462

The regressions are estimated using the dynamic RDD specification of Cuñat *et al.* (2012) with firm-meeting fixed effects. Standard errors (reported in parentheses) are clustered at the firm level.

in their importance. As can be seen, the point estimate is similar. In column (3), we examine patent quality by using as dependent variable  $\log(\text{citations}/\text{patents})$ , which is the logarithm of the number of citations in subsequent years divided by the number of patents for any given firm and year.<sup>16</sup> As is shown, the results mirror those we obtain for the number of patents in columns (1) and (2).

In columns (4)–(8), we further explore whether a long-term orientation is conducive to the pursuit of “riskier” innovation, i.e., (1) patents that are in the tails of the distribution (“hits and flops”), and (2) patents that are explorative rather than exploitative. To construct the measure of hits and flops, we follow Azoulay *et al.* (2011) and code a patent as being a hit (flop) if the number of citations it receives is above (below) the highest (lowest) citation decile across all patents in the same technology class. To obtain a firm-level measure, we divide the number of hits and flops by the number of patents for any given firm and year (*share of hits and flops*), and also consider both components separately (*share of hits* and *share of flops*, respectively). To distinguish between explorative and exploitative patents, we follow Benner and Tushman (2002). Specifically, we code a patent citation as being “new-to-the-firm” if the citation is to a patent that is neither one of the firm’s own patents (i.e., a self-citation), nor a patent previously cited by the firm in another patent. We then classify a patent as being exploratory (exploitative) if at least 80 percent (at most 20%) of the patent’s citations are new-to-the-firm.<sup>17</sup> To obtain a firm-level measure of explorative patents, we divide the number of explorative patents by the number of patents for any given firm and year (*share of explorative patents*). The firm-level measure of exploitative patents is constructed analogously (*share of exploitative patents*). As is shown in columns (4)–(8), we find that both the share of hits and flops and the share of explorative patents

increase significantly following the adoption of long-term compensation proposals, whereas we find no significant change in the share of exploitative patents. Overall, the results in columns (1)–(8) suggest that adopting a longer-term horizon is conducive to innovation, and especially the pursuit of risky and explorative R&D projects.<sup>18</sup>

### Stakeholder groups

In columns (9)–(12) we split the KLD-index into subindices pertaining to the four stakeholder groups (employees, environment, customers, and society at large). As is shown, all four subindices increase following the adoption of long-term compensation proposals. However, the effect is clearly the strongest (both economically and statistically) for employee- and environment-related CSR programs. This result echoes well with the recent findings of Edmans (2011, 2012), Edmans, Li, and Zhang (2015b), and Flammer (2013, 2015), showing that employee- and environment-related CSR programs are value-enhancing.

### Implementation

As discussed in the methodology section, shareholder proposals are not binding. Hence, even if a proposal receives a favorable vote, it is possible that the board will not implement it. While we do not observe whether a proposal has been implemented, we can look directly at whether executive compensation increases after the vote. We do so in Table A6 in Appendix S1, and find that indeed long-term compensation increases substantially after the vote. This analysis is described in Appendix B of Appendix S1.

<sup>16</sup> This citation metric is also subject to a truncation problem. By construction, a 2004 patent will receive fewer citations than a 1998 patent (all else being equal) because we only observe citations received up to 2006. To account for this truncation problem, we multiply the number of citations by the adjustment factor of Hall *et al.* (2001), provided in the NBER database. Moreover, we add one to the number of citations to avoid losing observations with zero citation when computing the logarithm (e.g., Atanassov, 2013; Flammer and Kacperczyk, 2016).

<sup>17</sup> In Table A4 in Appendix S1 we show that our results are robust if we use the alternative cutoffs proposed by Benner and Tushman (2002).

<sup>18</sup> A related question is whether firm risk increases following the adoption of long-term compensation proposals. In column (2) of Table A5 in Appendix S1, we examine this question directly by using as dependent variable the firm’s equity volatility, which we compute as the standard deviation of the daily returns in each year. The daily returns are obtained from CRSP. As can be seen, we find only weak evidence for an increase in firm risk—equity volatility increases by about 0.7 percent in the long run, but not significantly (*t*-statistic = 1.33). There are two potential reasons. First, while the evidence in Table 5 suggests that companies pursue riskier long-term projects (e.g., tail innovations), the risk profile of the firm’s other projects need not shift dramatically. Second, certain long-term strategies have been shown to be *risk-reducing*. In particular, the insurance-based view of CSR (e.g., Flammer, 2013; Godfrey, 2005) argues that CSR can serve as an insurance mechanism in adverse situations and hence reduce the firm’s overall risk profile.



## External validity

### *Close-call versus non-close proposals*

A limitation of our research design is that the effect is identified by the subset of proposals whose vote outcome is close to the majority threshold. Although this limitation is inherent to any RDD, it is especially important in our setting given the relatively small number of close call proposals. Indeed, only 65 proposals received a vote share within the  $\pm 5$  percent interval around the majority threshold, and 152 within the  $\pm 10$  percent interval. Accordingly, a potential caveat is that companies around the discontinuity may not be representative of the companies far from the discontinuity, which would limit the external validity of our findings.

We examine this potential issue in columns (1)–(6) of Table A7 in Appendix S1. Specifically, we consider the full set of characteristics provided in Table 1. For each characteristic, we report the mean (as well as the  $p$ -value of the difference-in-means test) for companies close to the threshold and companies far from the threshold. As can be seen, the two groups of firms are very similar. In particular, the difference in means is almost always insignificant. In the few instances in which the difference appears significant, the significance level is relatively weak. Hence, companies at the threshold are likely representative of other companies in our sample.

### *Companies with activist shareholders*

A related issue is whether the companies in our sample—that is, firms that vote on long-term compensation proposals—are representative of the broader universe of firms with activist shareholders. To assess whether this is the case, we benchmark our sample against all other firms in the RiskMetrics and SharkRepellent voting databases (essentially all large public firms in the U.S.). We provide this comparison in columns (7)–(9) of Table A7 in Appendix S1. As is shown, we find that both types of firms—firms that vote on long-term compensation proposals (“LT proposal”) versus firms that do not (“no LT proposal”)—are very similar *ex ante*. Accordingly, our results are likely to be generalizable to the broader universe of firms with activist shareholders.<sup>19</sup>

<sup>19</sup> We note that these similarities are not surprising given the nature of shareholder activism in the U.S. First, many shareholder

### *Companies without activist shareholders*

Finally, another related issue is whether the companies in our sample are representative of the broader universe of public firms—i.e., also those without activist shareholders. Naturally, the “LT proposal” versus “no LT proposal” distinction is not well defined for the latter. This benchmarking is nevertheless informative, as it allows us to assess whether our results would generalize to such firms if they had activist shareholders and were targeted with a long-term compensation proposal.

To examine this question, we benchmark our sample against other public firms in Compustat.<sup>20</sup> The comparison is provided in columns (10)–(12) of Table A7 in Appendix S1. As can be seen, the most significant difference—both in economic and statistical terms—is that firms in our sample are substantially larger ( $>7$  times larger based on total assets). This is consistent with prior research on shareholder activism. Indeed, a well-established institutional feature of shareholder activism is that activists target primarily large companies (e.g., Cai and Walkling, 2011; Cuñat *et al.*, 2012, 2015; Reneboog and Szilagyi, 2011; Smith, 1996). Some of the other differences in columns (10)–(12) are consistent with this size differential—small public firms are typically “growth firms,” that is, firms that grow faster (higher sales growth) and have better growth opportunities (higher Tobin’s  $Q$ ). In addition, firms in our sample rely more on debt financing (higher leverage), are more CSR-friendly (higher KLD-index), and, to a lesser extent, are less profitable (lower ROA and NPM, although these differences are only marginally significant).

proposals are symbolic in nature, i.e. they are submitted to draw general issues of corporate governance to the attention of the management and the public (e.g., Loss and Seligman, 2004). Second, and relatedly, shareholder activism often comes in “waves,” i.e. a given activist shareholder adopts an agenda (e.g., the reduction of CO<sub>2</sub> emissions, the provision of long-term incentives, etc.) and then submits a similar proposal to all/multiple firms in which the activist has non-trivial holdings (e.g., Gillan and Starks, 2007; Yermack, 2010). In the latter case, activists target a wide range of firms across industries and geographies, and their motive is orthogonal to pre-proposal characteristics of individual firms. Also, note that while the comparison provided in columns (7)–(9) of Table A7 in Appendix S1 indicates that the two types of firm (“LT proposal” versus “no LT proposal”) are very similar based on observables, it could still be that they differ based on unobservables. In Appendix C of Appendix S1, we use Heckman’s two-step approach to further rule out this issue.

<sup>20</sup> We include all Compustat companies within the sampling frame of RiskMetrics and SharkRepellent (S&P 1500 from 1997 to 2011 and Russell 3000 from 2005 to 2012, respectively).

Overall, these differences indicate that the firms in our sample are unlikely to be representative of the broader universe of firms without activist shareholders. While these differences do not bias our estimate of the treatment on the treated, they potentially restrict the external validity of our findings, as they leave open the question of whether our results would generalize to companies without activist shareholders.

## DISCUSSION AND CONCLUSION

Do companies benefit from a long-term orientation? This study suggests they do. Specifically, our main theoretical prediction is that an increased long-term orientation is value-enhancing—by adopting long-term incentives, companies are able to counteract managerial myopia and hence align managers' interests with long-term value creation.

To examine this question empirically, we study shareholder proposals on long-term executive compensation that pass or fail by a small margin of votes at shareholder meetings. Using an RDD specification, we find that the passage of long-term compensation proposals leads to a positive stock market reaction. More precisely, on the day of the vote, a proposal that marginally passes yields an abnormal return of 1.14 percent compared to a proposal that is marginally rejected. This evidence indicates that a long-term orientation is value-enhancing.

We also observe an increase in operating performance in the long run. Interestingly, operating performance decreases in the short run. This pattern suggests that managers invest in long-term projects that are costly in the short run, but pay off in the long run. We further document that companies are more likely to invest in long-term strategies—they increase their investments in innovation and stakeholder relationships. This suggests that a long-term orientation benefits companies by fostering innovation and allowing them to acquire intangible assets—such as legitimacy, reputation, and trust—through stakeholder relationships.

We caution that our findings are subject to the “internal versus external validity” tradeoff that often arises when using the RDD methodology. By approximating the ideal setting of randomized experiments, the RDD provides a clean causal estimate of the impact of long-term compensation proposals on firm outcomes (internal validity). However, our results are conditional on being

targeted by a long-term compensation proposal and hence may not generalize to other firms (external validity). When we benchmark the sample firms against other firms, we find that firms that vote on long-term compensation proposals are representative of the broader universe of firms with activist shareholders (essentially all large public firms in the U.S.), but not necessarily of the entire universe of U.S. firms. Accordingly, one has to be careful with extrapolation—our results need not generalize to companies without activist shareholders. Extending the external validity of this study by identifying natural experiments that apply to a broader universe of firms is an exciting challenge for future research.

This study contributes to the literature in several ways. First, to the best of our knowledge, our study is the first to examine the causal effect of a firm's long-term orientation on financial performance and business strategies. Time horizons are of foremost importance in business decisions, and hence understanding how a long-term orientation impacts firm outcomes is at the very core of corporate strategy. In this vein, our finding that a longer-term orientation is beneficial to companies has potentially important managerial implications.

Second, by bridging different fields of research, we contribute to the multi-disciplinary dialogue in organizational studies that examines the role of “time” and how it affects organizations and their decision-making. This echoes the recent call to study how time horizons shape organizations and their strategic decisions (e.g., Ancona *et al.*, 2001b; Slawinski and Bansal, 2015; Souder and Bromiley, 2012).

Third, our article contributes to the large literature on executive compensation (for a recent survey, see Edmans and Gabaix, 2016). In this vein, our article is related to recent work that studies how the vesting period of stock options affects the strategic release of news (Edmans *et al.*, 2015a) and equity sales (Edmans, Fang, and Lewellen, 2015c). Our article adds to this literature by studying how the long-term component of executive compensation relates to firm value, firm performance, and long-term strategies.

Lastly, we contribute to the vast literature on corporate governance by highlighting a *time-based* agency problem—i.e., managers' and shareholders' time preferences are misaligned and, as a result, managers do not act in shareholders' best interests. As such, our study raises the question of

the temporal dimensions of corporate governance and the optimal design thereof. While our findings indicate that long-term incentives are beneficial to companies, they do not imply that short-term incentives are value-decreasing. On the contrary, a well-established result in the corporate governance literature is that takeover pressure—and hence short-term monitoring—is value-enhancing (e.g., Cuñat *et al.*, 2012; Gompers *et al.*, 2003). Clearly, short-term incentives are important as well. Absent such incentives, managers would exert too little effort in the short run. Rather, companies ought to consider both short-term and long-term incentives, and find the right balance between them. Making ground on this topic and, more generally, the optimal design of the temporal dimension of corporate governance is an exciting avenue for future research.

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## SUPPORTING INFORMATION

**Additional supporting information may be found in the online version of this article:**

**Appendix S1.** Online Appendix.