Say on Pay Design and its Repercussion on CEO Investment Incentives, Compensation and Firm Profit.*

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Abstract: We conduct a laboratory experiment to study different say on pay regimes in a setting where shareholders provide incentives to a CEO for a risky project choice through a discretionary bonus scheme. We compare three different types of shareholder voting rights (advisory, unconditionally binding, and conditionally binding voting rights) to the baseline case where shareholders have no say on CEO pay. We make the following observations: (1) Advisory and conditionally binding voting rights do not distort CEO investment incentives. Unconditionally binding voting rights adversely affect the CEO's investment incentives. (2) Unconditionally binding voting rights are an effective instrument to curb executive compensation. Advisory shareholder voting rights have the opposite effect and can even increase executive compensation. (3) A substantial fraction of shareholders rejects CEO bonus proposals whenever they have the right to do so. This effect is largely independent of the type of voting right in place and becomes more pronounced in case of poor project performance. (4) Advisory and conditionally binding voting rights have only limited impact on firm profit and executive compensation. In contrast, unconditionally binding voting rights reduce both, firm profit and executive compensation significantly. Overall, our results suggest that regulators should carefully evaluate dysfunctional economic consequences of shareholder voting rights before they are introduced or before existing rules are tightened.

Keywords: Corporate Governance, Executive Compensation, Experimental Economics, Investment Incentives, Say on Pay

JEL Classification: G34, G38, M48.

1 Introduction

Until very recently, the decision on the total amount and the structure of executive remuneration in public firms was in the hands of the board of directors or a particular compensation committee. As a response to a controversial debate on seemingly "excessive" executive pay and the mismatch between pay and performance in some publicly-traded firms, the U.K. was the first country to introduce separate shareholder voting rights on executive pay, also termed as "Say on Pay" (henceforth SoP). The so called Directors' Remuneration Report Regulations (DRR) requires publicly listed U.K. firms to submit their remuneration report to a mandatory shareholder vote in each financial year[1]. In the meantime, other countries such as France, Germany, the Netherlands, Norway, Spain, and Sweden have adopted similar rules.[2] In 2010, the U.S. adopted the "Dodd-Frank Act". Section 951 of this act contains an amendment of the Securities and Exchange Act that obliges listed firms to conduct an advisory shareholder vote on the compensation of their top executives. In a separate resolution, the shareholders must determine whether the vote takes place every year, every two years or every three years[3].

If SoP is not binding, as in the U.K. and the U.S., shareholders can express their dissatisfaction with the current compensation policy but they cannot directly force the board of directors to change it. Empirical studies on the impact of the DRR on the compensation practice of U.K. firms provide mixed results about the economic consequences of such a rule. For example, Ferri and Maber (2009) find no evidence that the overall level and growth rate of executive compensation changed after the introduction of the new legislation. However, they observe an increased sensitivity of compensation to both, negative operating performance and negative stock performance. Both, Carter and Zamora (2009) and Alissa (2009) find that shareholder voting dissent is positively related to excess compensation. In addition, they provide evidence that boards seem to respond to high levels of shareholder dissatisfaction by reducing excessive compensation in subsequent periods.[4] By contrast, Conyon and Sadler (2010) find a positive relation between the level of CEO pay and average voting dissent, but they provide little evidence that a higher level of shareholder disapproval has an impact on either, the level of compensation or the pay-for-performance sensitivity in subsequent years.

The question whether shareholder voting rights constitute an effective way to mitigate compensation practices that are not in the shareholders' best interest is debated controversially. Broadly

1 See The Directors Remuneration Report Regulations (2002).

2 See European Commission (2010) for a detailed overview of the adoption process within Europe.

3 See House of Representatives (2010) and Bainbridge (2010) for further details.

4 The evidence for board reaction found by Carter and Zamora (2009) is generally weak. Alissa (2009) also finds a positive relation between shareholder dissatisfaction and CEO turnover in subsequent periods.

spoken, the latter is the case if compensation exceeds the management's market value or, if the executive's incentives are poorly aligned with firm performance. Recent literature has argued that these problems are likely to arise in publicly traded firms where managers often exert substantial control over their pay, either via influence on the board of directors or via the selection of compensation consultants.[5] Proponents of say on pay advocate shareholder voting rights as a promising tool that gives shareholders a voice to curb excessive pay practices. Opponents, however, claim that SoP allows shareholders to micromanage firms without understanding either the market for executives or the complexity of their incentive systems.[6] The critics further point out that measuring the management's contribution to firm value is a very difficult task and that this difficulty can provoke shareholders to refuse even properly designed and well calibrated compensation packages.[7] If managers anticipate the risk of losing parts of their compensation, SoP is likely to distorts their effort and investments incentives.

Despite the concerns of its opponents that SoP is too strong an intrusion into corporate life, it can also be argued that the predominant practice of non-binding shareholder votes does not have enough teeth to prevent undesirable compensation practices. If boards or compensation committees are management-friendly, they may simply ignore the shareholders' vote and keep on doing business as usual.[8] Therefore, some shareholder activists go further and demand the introduction of mandatory binding voting rights on executive pay.[9]

Public pressure calling for legislative action often prompts politicians and regulators to adopt regulatory measures before their consequences for firms and the economy are fully understood.[10] A natural and less costly alternative to the premature introduction of legislation with its potentially (un-)desirable consequences is an experimental test of alternative regulatory regimes. In this paper, we adopt this approach by testing different shareholder voting right regimes in a laboratory experiment. The experiment is based on a simple theoretical model in which a privately informed

5 See Bebchuk and Fried (2003, 2004) and Conyon, Peck and Sadler (2009). See also the controversial debate between Kaplan (2008), Walsh (2008), and Bogle (2008).

6 Jones (2009).

7 See Bean (2009), Cai and Walkling (2009), Jones (2009) or Kiviat (2008) for a discussion of the arguments raised by both sides of the debate.

8 Likewise, even massive negative press coverage does not seem to have much impact on CEO pay, see Core, Guay and Larcker (2008).

9 So far a binding vote on remuneration reports exists in the Netherlands and in Sweden. In Switzerland, the shareholder activist Thomas Minder has initiated a public voting campaign demanding an annual binding vote on the amount of executive pay for all publicly listed firms in Switzerland (The Economist, 2007).

10 The field of executive compensation seems to be a particularly fruitful playground for hasty and poorly substantiated regulatory activities. Well known examples include the recently introduced bonus tax for bankers in the U.K. and the million-dollar salary tax cap in the U.S., see Gök (2008).

CEO needs to be motivated to make a goal congruent project selection on behalf of her shareholders. The investment opportunity set consists of a risky and a riskless project. The CEO privately learns the success probability of the risky project before making the project choice. To implement a goal congruent project decision, the firm offers the CEO a bonus contract based on the realized project cash flow. If the CEO selects the riskless project, she receives a salary but no bonus. To make sense of shareholder voting rights, we let the CEO have limited discretion over the size of her bonus. At the beginning of each period, the CEO thus makes separate bonus proposals for the successful and for the unsuccessful outcome of the risky project. After the project outcome is realized, shareholders vote on the CEO's bonus proposal, provided they have the right to do so.

We compare a world without shareholder voting rights with three different say on pay regimes. First, we consider advisory shareholder votes on compensation. Second, we analyze unconditionally binding shareholder votes. Under this regime, shareholders vote on the CEO's bonus regardless of the project's performance. Third, we consider conditionally binding voting rights. Under this regulation, shareholders can only vote in case of project failure while having no vote whatsoever in case of project success. Equilibrium analyses of the four regimes suggest that no voting rights and advisory voting rights are economically equivalent. Under both regimes, shareholders have no right to restrict the CEO's bonus. Therefore, the CEO always makes a goal congruent project choice but extracts the maximum possible bonus. By contrast, binding voting rights suffer from shareholders' moral hazard. Once the CEO has selected the risky project, dividend maximizing shareholders have strict incentives to reject the CEO's bonus proposal ex post. A rational CEO anticipates this strategy and chooses the riskless project in the first place. As a consequence, CEO and shareholders are caught up in a sequential prisoner's dilemma that lowers executive compensation and firm profit. This dilemma can be avoided by restricting binding voting rights to poor performance only. Since in this case, the CEO can still extract rents if the project is successful, goal congruent investment incentives are sustained as long as the expected bonus for a successful project remains sufficiently large.

We test our theoretical model in a laboratory experiment with 250 participants. The experimental results largely confirm the predictions of the model and provide some additional insights. First, we find that shareholder voting rights impede goal congruent project selection only if they are unconditionally binding. In contrast, advisory and conditionally binding voting rights do not distort the CEO's investment incentives. We also find that only binding shareholder voting rights are an effective instrument to curb executive compensation. In contrast, advisory shareholder voting rights have the opposite effect, that is, they lead to increased levels of executive compensation. Third, we find that the majority of shareholders rejects bonus proposals whenever they have the right to do so. This effect is independent of the voting right regime in place and becomes more pronounced for poor project performance. Fourth, we find that advisory and conditionally binding

shareholder voting rights have no significant impact on executive compensation and firm profit. Conversely, unconditionally binding voting rights allow shareholders to extract a larger share of the realized return of the risky project. This fact discourages the CEO to choose the risky project and thereby impedes a goal congruence project selection. Our findings show that the resulting net effect is negative such that unconditionally binding voting rights reduce both, firm profit and executive compensation.

In summary, our analysis suggests that regulators should carefully evaluate potential dysfunctional economic consequences of shareholder voting rights before introducing them or before tightening existing rules. Our study suggests that advisory shareholder votes are ineffective in curbing CEO compensation. In addition, our findings show that advisory shareholder voting rights can even increase CEO compensation in poorly governed firms. Conversely, unconditionally binding voting rights are an effective instrument to curb executive pay. On the downside however, they distort CEO investment incentives and thereby reduce firm profit. These negative consequences can be avoided by the introduction of conditionally binding voting rights, provided that the CEO is granted a sufficiently large rents in case of project success.

The remainder of the paper is organized as follows. Section two develops the theoretical model and derives the hypotheses for the experimental test. Section three illustrates the experimental design. Section four describes and discusses the experimental findings and the hypotheses tests. Section five concludes the paper with a summary and some suggestions for future research.

2 Theory and hypothesis development

2.1 Model assumptions

The starting point of our analysis is a simple model of incentive provision for goal congruent project selection. A risk neutral CEO runs a firm on behalf of risk neutral shareholders. The CEO's task consists of selecting one of two mutually exclusive projects available to the firm. Both projects require an identical investment outlay of I_0, which we normalize to zero without loss of generality. Project P_1 is riskless and yields a certain payoff of y. Project P_2 is risky and yields a payoff of x_H in case of success and a payoff of x_L in case of failure, where $x_L < y < x_H$.

The probability of success equals $p \in (0,1)$. It can take two different values, $\underline{p}$ and $\overline{p}$, where $\overline{p} > \underline{p}$. Let $E[x(p)] = x_L + p \cdot (x_H - x_L)$ denote the expected payoff of the risky project. We assume that $E[x(\overline{p})] > y > E[x(\underline{p})]$ so that a risk neutral investor would strictly prefer the risky (riskless) project if $p = \overline{p}$ (if $p = \underline{p}$). The CEO privately learns the risky project's success probability before deciding on its adoption. The shareholders do not have access to this information and cannot verify the success probability ex post from observing the realized project cash flow.

To motivate the CEO to make a goal congruent project choice, the firm offers her a bonus contract based on the realized project cash flow. The pay scheme comprises a fixed salary w_i related to the project chosen by the CEO and a bonus $b_j, j = L, H$, contingent on the outcome of the risky project, provided that P_2 was chosen. Accordingly, the CEO receives a riskless compensation equal to $s(y) = w_1$ when choosing P_1 and an expected compensation of $E[s(x(p))] = w_2 + b_L + p \cdot (b_H - b_L)$ when choosing P_2. The second expression shows that the performance based part of the bonus payment actually equals $B = b_H - b_L$ whereas b_L takes the form of a guaranteed bonus that is paid regardless of the project's success. Since a guaranteed bonus has the same incentive effect as a salary, we normalize w_2 to zero in what follows.[11]

The focus of our study is not on optimal contracting but on the relative efficiency of incentive compatible compensation contracts and the interplay between shareholder voting rights and project selection incentives. A contract is incentive compatible, if it induces the CEO to make a project choice that is in the best interest of shareholders. Strong goal congruence between CEO and shareholders is achieved by all contracts satisfying the following two conditions:

$$E[s(x(\overline{p}))] > s(y) > E[s(x(\underline{p}))] \quad (1)$$

$$E[x(\overline{p}) - s(x(\overline{p}))] > y - s(y) > E[x(\underline{p}) - s(x(\underline{p}))] \quad (2)$$

The first condition requires that the CEO strictly prefers the risky project if $p = \overline{p}$ and the riskless project if $p = \underline{p}$. The second condition requires that the pay differences required to satisfy (1) are not too large to revert the shareholders' preference order over the two projects.

Motivated by recent literature suggesting that CEOs in poorly governed firms have some discretion over their own compensation, we assume that the CEO can propose the bonus parameters of her compensation contract within a certain range.[12] In particular, we allow the CEO to make a bonus proposal $b_j \in [0, \overline{b}_j]$ and assume that the firm fixes the salary $w_1 \equiv \overline{w}$ so that the conditions in (1) and (2) are satisfied for $b_j = \overline{b}_j$. These upper limits prevent that the CEO is able to capture the whole firm profit. They can be thought of being determined by an implicit outrage constraint that is created by market forces or social costs (Bebchuk and Fried 2004).

To counteract unreasonable bonus demands by the CEO, shareholders may obtain the right to vote on the bonus proposal at the annual shareholders' meeting.[13] We consider three different

11 We note that a project-contingent salary might seem unusual. However, an equivalent formulation of the bonus contract with a project-independent salary of $w_1 = \overline{w}$ is always possible if we redefine the guaranteed bonus related to P_2 as $G = w_2 + b_L - \overline{w}$, so that the expected pay becomes $E[s(x(p)] = \overline{w} + G + p \cdot B$.

12 See e.g. Bebchuk and Fried (2003, 2004) or Conyon, Peck and Sadler (2009). This assumption captures the notion that say on pay makes only sense if the CEO has some discretion over her pay. It does not imply, however, that the majority of all listed firms are characterized by poor governance.

13 For simplicity, we assume that the salary is set in line with shareholders' best interests. This allows us to restrict

types of shareholder voting rights and compare them with a traditional world in which shareholders do not have a say on pay (T_1). The first scenario (T_2) considers advisory shareholder votes on compensation as they are practiced in the U.K. since 2002. Under this rule, the shareholders can express their opinion on executive pay but they cannot actively influence CEO compensation. The second scenario (T_3) considers unconditionally binding shareholder votes, the strictest possible form of say on pay. We consider a version where the shareholders can limit the bonus component in the CEO's compensation regardless of the firm's performance. That is, the shareholders can reject the CEO's proposal and thereby set both bonus parameters b_j to zero ex post.

Based on the empirical observation that shareholders' voting dissent with executive compensation seems to be more pronounced when firms perform poorly (Ferri and Maber, 2009), we also consider conditional voting rights in as a third scenario (T_4). We allow shareholders to reject the CEO's bonus proposal in case of poor performance, while giving them no voting right whatsoever in case of project success. Hence, in T_4, shareholder can reject b_L, but must always accept b_H. This form of governance protects the rents of a successful CEO from expropriation, while putting the bonus of a poorly performing CEO at risk.

2.2 Equilibrium analysis

We next analyze the project selection and voting equilibria arising from the four different voting regimes. The equilibrium for scenario T_k can be characterized by an outcome tuple $\Gamma_k^* = (P_i, b_L, b_H)$ containing the CEO's optimal project choice and the bonus payments determined by the CEO's bonus proposals and the shareholders' optimal voting strategies under the four different scenarios. Since the CEO is interested in maximizing her compensation, she will always choose the maximum possible bonus and set $b_j^c = \overline{b}_j$. Likewise, the shareholders are interested in maximizing their return on investment net of the CEO's pay. Since the compensation paid to the CEO reduces the shareholders' return and voting takes place after the project decision has been made, it is a dominant strategy for shareholders to cut the CEO's bonus to $b_j^s = 0$ whenever they have the right to do so.

If shareholders have no say on pay, the CEO can determine her own bonus package within the limits of the outrage constraint. Since (1) and (2) are satisfied for $b_j = \overline{b}_j$, the CEO will make a goal congruent project choice and receive an expected pay of

$$E[s(x(\overline{p}))|b_L^c, b_H^c] = \overline{b}_L + \overline{p} \cdot (\overline{b}_H - \overline{b}_L) \quad \text{for} \quad p = \overline{p} \tag{3}$$

and $s(y) = \overline{w}$ for $p = \underline{p}$. If shareholders have advisory voting rights, they can reject the CEO's bonus proposal. Nevertheless, since the vote has no impact on compensation, the CEO can extract the

the potential voting rights to the CEO's bonus payment.

same compensation as if the shareholders had no voting rights. Therefore, the equilibrium outcomes for scenarios T_1 and T_2 are identical and given by the outcome tuple $\Gamma_1^* = \Gamma_2^* = (P_2, \overline{b}_L, \overline{b}_H)$. This prediction of our model is largely consistent with recent empirical evidence on the impact of advisory shareholder votes in the UK that found little or no evidence for changes in the level and structure of CEO compensation after the introduction of advisory shareholder voting rights (Conyon and Sadler, 2009, Ferri and Maber, 2009).

The situation changes dramatically if shareholders have unconditionally binding voting rights. As argued above, the rational strategy of shareholders consists of cutting the CEO's compensation to the lowest possible level, that is, to $b_j^s = 0$. The CEO will correctly anticipate the shareholders' equilibrium strategy and realize that $E[s(x(p))|b_L^s, b_H^s] = 0$. Since $\overline{w} > 0$, she will select the riskless project in the first place. The unique subgame perfect Nash-equilibrium involves the outcome tuple $\Gamma_3^* = (P_1, 0, 0)$. This outcome is inefficient since $\overline{w} < E[s(x(\overline{p}))|b_L^c, b_H^c]$ and $y - \overline{w} < E[x(\overline{p})] - E[s(x(\overline{p}))|b_L^c, b_H^c]$ for incentive compatible contracts from (2). In fact, the players are facing a sequential prisoner's dilemma. Both parties could increase their payoff by adopting strategies that implement the outcome tuple Γ_1^*. However, since shareholders cannot commit not to reject the bonus proposal ex post, Γ_1^* is not an equilibrium outcome. Thus, moral hazard on the part of shareholders impedes the efficiency of unconditionally binding shareholder voting rights.

The prisoner's dilemma can be avoided by introducing conditionally binding voting rights. Repeatedly, shareholders have been found particularly dissatisfied with bonus payments in case of poor firm performance. It therefore seems reasonable to restrict shareholder voting rights to poor outcomes. In our model, this situation arises if the CEO chooses the risky project and the project fails thereafter. In this case, the shareholders would rationally reject the bonus proposal and set $b_L^s = 0$. However, if the project is successful, the CEO receives the proposed bonus $b_H^c = \overline{b}_H$. At the project selection stage, the manager evaluates the expected compensation given the shareholders' equilibrium strategy and adopts the risky project P_2 if

$$E[s(x(\overline{p}))|b_L^s, b_H^c] = \overline{p} \cdot \overline{b}_H > \overline{w}. \tag{4}$$

Conditional shareholder voting rights can give rise to two different equilibria. If condition (4) does not hold, the manager prefers the riskless project and the equilibrium outcome is equivalent to Γ_3^*. However, the more interesting case occurs if (4) holds: the CEO makes a goal congruent project choice and the equilibrium outcome equals $\Gamma_4^* = (P_2, 0, \overline{b}_H)$. Hence, conditional voting rights allow to implement the goal congruent project choice at a lower cost than scenarios T_1 and T_2 because bonuses are only paid out in case of project success, but not in case of project failure. Interestingly, condition (4) is more likely for a given success probability $\overline{p}$ if the manager has more discretion over her bonus $\overline{b}_H$.[14] In our experimental test of the model, we calibrate the parameters of the decision

14 In fact, as long as $E[x(\overline{p})] - y > \overline{p} \cdot \overline{b}_H - \overline{w}$, the shareholders will still prefer the risky project even if they receive

problem so that condition (4) holds. Accordingly, our hypotheses are based on the premise that conditional shareholder voting give rise to the equilibrium outcome $\Gamma_4^* = (P_2, 0, \overline{b}_H)$.

2.3 Hypotheses development

Our theoretical analysis suggests several predictions concerning the impact of shareholder voting rights on the selection of investment projects, the CEO's bonus proposals, the shareholders' voting behavior, the total amount of executive pay, and firm profit. We organize the hypotheses along the decision sequence of our model.

The first group of hypotheses deals with the impact of shareholder voting rights on goal congruent project selection. Goal congruence requires that the CEO selects the risky project for $p = \overline{p}$ and the riskless project for $p = \underline{p}$. Our analysis predicts that advisory voting rights have no effect on goal congruence because they do not impact compensation. Consequently, a CEO makes the same project choice independent of whether shareholders have advisory voting rights or no voting rights at all.

With unconditionally binding voting rights, the CEO anticipates that rational shareholders will reject her bonus proposal ex post. Therefore, she always prefers the riskless over the risky project regardless of the risky project's prospects. Thus, binding shareholder voting rights can curb executive compensation. However, they can also significantly distort goal congruent project selection. Conditionally binding voting rights do not impede goal congruence if the CEO's expected rent for a successful project is larger than the fixed salary for the riskless project. Since we calibrate the parameters of the experiment according to condition (4), we do not expect that conditional shareholder voting rights impede goal congruence. These predictions can be summarized in terms of three hypotheses on the impact of shareholder voting rights on goal congruent project selection:

> **H1a:** Advisory shareholder voting rights have no impact on goal congruent project selection.
>
> **H1b:** Unconditionally binding shareholder voting rights are detrimental to goal congruent project selection.
>
> **H1c:** Conditionally binding shareholder voting rights have no impact on goal congruent project selection.

The second group of hypotheses refers to the impact of shareholder voting rights on the optimal strategies of the players. As argued in section 2.2, a rational and self-interested CEO will always

a lower share of the expected surplus.

propose the highest possible bonus and a rational and self-interested shareholders will cut the bonus of the CEO to zero regardless of the project outcome. Based on the predictions of our theoretical model, we expect the following two hypotheses to hold:

H2a: The CEO always demands the maximum possible bonus for each possible outcome independent of the voting right regime in place.

H2b: Provided they have the right to vote, shareholders always reject the CEO's bonus proposal independent of the project outcome.

The last group of hypotheses concerns the impact of shareholder voting rights on CEO compensation and firm profit. First, our model predicts that advisory shareholder voting rights have no impact on CEO compensation and firm profit. This is so because with advisory votes, a CEO can always ignore the vote and pocket the proposed bonus anyway. In contrast, unconditionally binding voting rights shift the bargaining power to shareholders. Income maximizing shareholders will therefore reject the bonus proposal and reduce total compensation accordingly. A CEO who correctly anticipates the shareholders' optimal voting strategy, will always select the riskless project in the first place. As a consequence, she will receive a lower total compensation compared to the benchmark case where shareholders have no voting rights. Likewise, firm profit will also be lower in case of unconditionally binding shareholder voting rights. Shareholders can only benefit from their equilibrium voting behavior if the CEO erroneously deviates from her dominant strategy and adopts the risky project. Only then can shareholders increase their dividend by rejecting the CEO's bonus proposal.

With conditionally binding voting rights, shareholders can turn down the CEO's bonus proposal only in case of project failure. Therefore, and given that (4) holds, the CEO selects the risky project but receives a lower compensation than without shareholder voting rights. On the other hand, shareholders benefit form the same investment returns as without shareholder voting rights but they face lower compensation cost because of the limited bonus payments in case of poor performance. Accordingly, we expect conditionally binding voting rights to reduce CEO compensation and to increase firm profit. These results can be summarized in terms of the following three hypotheses:

H3a: Advisory shareholder voting rights have no impact on total CEO compensation and firm profit.

H3b: Unconditionally binding shareholder voting rights reduce total CEO compensation and firm profit.

H3c: Conditionally binding shareholder voting rights reduce total CEO compensation and increase firm profit.

3 Experiment

3.1 Participants and Design

To test the predictions of our theoretical model, we conducted an experiment with a total number of 250 undergraduate students with major in business administration from a large Swiss university. Half of the subjects adopted the role of a CEO and the other half assumed the role of a representative shareholder. The participants were randomly assigned to their roles and kept them during the entire experiment.

The experiment was programmed and conducted with the software z-Tree (Fischbacher 2007). We ran the experiment with four different treatments reflecting the four voting right regimes analyzed in the theoretical model. For each treatment we conducted two experimental sessions to which we randomly assigned different individuals. Participants in each session were divided into 4 different matching groups defining a subset of individuals that interact during the experiment. Participants were informed that the first two rounds were training periods and that the payoffs won during these rounds would be reset to zero. We did not inform the participants about how many rounds the game would last. During the experiment, participants then interacted for a total of 21 rounds. After each round, the participants' computer screens indicated both, the payoff that was gained during the last round and the accumulated game payoff up to the current round. Before each round, we randomly matched each CEO with a representative shareholder from the same matching group. This procedure assures that observations are statistically independent across matching groups. The breakdown of participants into treatments, sessions, and matching groups is given in Table A-1 in the appendix.

3.2 Procedure

The participants were separated by partitions and interacted anonymously through a computer network. At the beginning of each session, participants received a brief oral introduction and detailed written instructions concerning their roles, the investment opportunity set, the payoffs, the information available to the CEO and the shareholders, and the decisions they were supposed to take. As in the theoretical model, the opportunity set consisted of two projects, a riskless project P_1 and a risky project P_2.

[please insert Table 1 about here]

As shown in Table 1, P_1 yields a riskless return of $10,000$ Experimental Currency Units (ECU), of which the CEO receives a fixed salary of $2,000$ ECU. The resulting firm profit equals $8,000$ ECU.

The risky project yields a return of $25,000$ ECU in case of success and $5,000$ ECU in case of failure. If choosing P_2, the CEO receives no salary but a bonus of up to $5,000$ ECU ($1,000$ ECU) in case of a success (failure). The firm's profit is the difference between project return and the CEO's pay. Participants assuming the role of shareholders were informed that they would represent a typical large shareholder entitled to receive a dividend of 10% out of the firm's profit.

We informed all participants that there were two possible probability distributions for the risky project. We set the probability of success for the first distribution to $\overline{p} = 0.8$ and for the second distribution to $\underline{p} = 0.05$. These values yield clear-cut preference relations for the project choice that even hold for CEOs that substantially violate the risk neutrality assumption employed in the theoretical model. In fact, for the maximum bonus attainable by the CEO, the expected compensation equals $E[s(x(\overline{p}))|\overline{b}_L, \overline{b}_H] = 4,200$ ECU for the first distribution and $E[s(x(\underline{p}))|\overline{b}_L, \overline{b}_H] = 1,200$ ECU for the second as compared to a salary of $\overline{w} = 2,000$ ECU that the CEO receives upon choosing P_1.

In each round, the CEO privately learns the probability distribution and selects a project. Since a nontrivial investment decision and an interaction between CEO and shareholders can only be expected for a high probability of success, we communicated $\overline{p} = 0.8$ to the CEO in all but one round. As a control for the consistency of investment decisions with the predictions of our theoretical model, we informed CEOs in round 4 that the probability of success was only $\underline{p} = 0.05$. In line with our expectations, an average proportion of 84.8% of the CEO's across all treatments, selected the riskless project P_1 in this round. The analysis of the experimental data in section 4 is based on the 20 rounds for which the success probability was high. Throughout the experiment and in all treatments, project P_2 was successful 15 times and failed 6 times (round 4, 9, 13, 16, 19, and 21). The conditional probability of success for the high success probability sample (that excludes round 4) equals $15/20 = 0.75$. This value is largely consistent with the success probability we communicated to the participants.

If the CEO selects P_2, she is asked to propose a bonus of up to $5,000$ ECU ($1,000$ ECU) in case of project success (failure). These numbers represent exactly 20% of the respective project return. After submitting the bonus proposal, both players are informed about the project's success and the resulting cash return for the firm. If P_1 was chosen, the CEO receives her salary, the shareholders receive their dividend, and the round ends. If P_2 was chosen, the shareholders are informed about the CEO's bonus proposal and asked to vote on it whenever they have the right to do so. In treatment T_1 shareholders have no voting rights. Therefore, the CEO receives the proposed bonus for the realized project outcome. The shareholders are informed about the CEO's pay and receive their dividend.

In the other three treatments, shareholders are asked to either accept or refuse the CEO's bonus proposal. In T_2, the vote is advisory and does not impact CEO pay. As in T_1, the CEO

receives the proposed bonus and shareholders receive their dividend. In T_3 shareholders can refuse the bonus for both project outcomes. If they do so, the CEO receives a compensation of zero and shareholders increase their dividend by an amount equal to 10% of the refused bonus. If they accept the proposal, the game ends as in T_1 and T_2. In T_4, shareholders are only allowed to vote if P_2 fails. If they refuse the proposed bonus in case of project failure, the game ends as in T_3. If they accept it, it ends as in T_1 and T_2. The game was repeated 21 times for each treatment. Before each round, players were informed that they face different shareholders and CEOs, respectively.

Finally, participants were paid out. They received a fixed participation fee of $1,000$ ECU and 10 bonus points on the final course exam.[15] In addition, participants received a performance-contingent payment based on the compensation and dividends realized during the experiment. Remuneration was paid out in CHF at a conversion rate of 0.60 CHF for each $1,000$ ECU earned during the experiment. The average remuneration among all participants was CHF 29.77. Shareholders received an average dividend of CHF 19.73, whereas CEOs realized an average compensation of CHF 39.81 during the whole experiment. Across all treatments, payoffs for CEOs (shareholders) were within a range of CHF 13.80 (CHF 12.72) and CHF 49.80 (CHF 22.65). A detailed overview of the payoffs for the different treatments is given in Table A-2 in the appendix.

The experiment lasted about 50 minutes. At the end of the experiment, participants filled out exit questionnaires that contained several manipulation and comprehension checks to verify whether the participants correctly understood the game, its payoff structure, and their choice set. The analyses of these manipulation checks revealed that the participants understood the experimental task, felt able to solve it and did so with sufficient care.

4 Results

4.1 Descriptive statistics

We begin the presentation of experimental results with an overview of the descriptive statistics for the relevant variables of our model.[16] The first variable of interest is the project choice made by the CEOs. The results for the four treatments are presented in the first two columns of Table 2.

15 The maximal number of points that can be achieved in the final exam is 240. Students were given the alternative opportunity to earn the 10 bonus points by solving an exercise that required the same time investment as participating in the experiment.

16 All results presented in this section are calculated for the 20 rounds in which the success probability for the risky project was 0.8. Since the sample was split into CEOs and shareholders, it contains 20 observations for randomly matched group of players, yielding a total number of 2'500 observations for the relevant sample.

It can be seen that around 95% of all CEOs chose the risky project P_2 in treatments T_1 (95.94%), T_2 (95.63%) and T_4 (95.00%) but only 55.34% of the CEOs did so in treatment T_3.

[please insert Table 2 about here]

Table 2 also shows the average bonus proposals made by CEOs. The mean bonus proposals for successful projects in treatments T_1 $(4,613.14)$, T_2 $(4,849.82)$ and T_4 $(4,850.92)$ are of the same order of magnitude and considerably higher than for T_3 $(3,414.61)$. Likewise, the mean bonus proposals for unsuccessful projects in treatments T_3 (509.50) and T_4 (551.66) are visibly lower than in treatments T_1 (804.17) and T_2 (896.06). Interestingly, the highest bonuses are demanded with advisory shareholder voting rights. The observed proportions of goal-congruent project choices are in line with the theoretical model that predicted an inefficient investment decision for unconditionally binding shareholder voting rights. However, it is striking that CEOs seem to accommodate shareholders with their bonus demands whenever the voting rights are binding, that is, for treatment T_3 and for unsuccessful projects in T_4. These observations suggest that binding voting rights are an effective instrument to avoid excessive bonus proposals. At least some CEOs seem to hope that modest bonus demands will prevent shareholder from rejecting them.

[please insert Table 3 about here]

The shareholder votes for the relevant treatments are presented in Table 3. The average voting dissent for successful projects equals 44.29% as compared to 70.24% for unsuccessful projects. Shareholders seem to be more willing to reward CEOs for good than for poor results even if both outcomes are the consequence of an efficient project decision. In contrast, the enforceability of voting rights does not appear to have a clear impact on shareholders' voting behavior. For example, the average voting dissent for unsuccessful projects and advisory voting rights (70.97%) is of the same order of magnitude as for conditionally binding voting rights (73.83%). Likewise, comparing advisory (T_2) and unconditionally binding voting rights (T_3) yields a higher voting dissent for the latter in case of successful projects (40.04% vs. 51.98%) but a lower voting dissent for unsuccessful projects (70.97% vs. 60.87%).

[please insert Table 4 about here]

The mean values of CEO compensation, firm profit and total welfare (CEO compensation plus firm profit) are given in Table 4. It appears that all three measures are of the same order of magnitude for treatments T_1, T_2 and T_4 (CEO compensation is $3,617$, $3,770$, and $3,597$; firm profit is $16,086$, $15,730$, and $15,997$) but significantly lower for treatment T_3 (CEO compensation: $1,581$;

firm profit: 14, 342). These results are consistent with the predictions of the theoretical model. The figures in Table 4 suggest that unconditionally binding shareholder voting rights are an effective instrument to reduce executive pay. However, they also indicate that restricting executive pay is costly to shareholders. As shown in Table 2, only 55.34% of all CEOs in T_3 make a goal congruent project decision. Hence, CEOs seem to anticipate the risk that shareholders will turn down bonus proposals to increase dividends.[17] As a consequence, firm profit and total welfare are considerably lower than with the alternative voting mechanisms.

The data also suggest that binding shareholder voting rights do not impede efficiency if they are restricted to poor outcomes only. In fact, compensation and firm profit are roughly the same with conditionally binding (CEO compensation: 3, 597; firm profit: 15, 997) and no shareholder voting rights (CEO compensation: 3, 617; firm profit: 16, 086), whereas CEO compensation is slightly higher (3, 770) and firm profit is somewhat lower (15, 730) with advisory shareholder voting rights.

4.2 Hypotheses tests

We first test the hypotheses on the impact of shareholder voting rights on goal congruent project selection. For the relevant sample, goal congruence requires that the CEO selects the risky project. Panel A of Table 5 exhibits the mean difference in the proportions of risky project choices for the four different voting right regimes.

[please insert Table 5 about here]

The first line of the table measures the impact of adopting shareholder voting rights in a previously unregulated jurisdiction and thereby allows to test H1a-H1c. The introduction of advisory voting rights slightly decreases the proportion of risky project choices but this difference is small (0.31%) and not significant. Likewise, binding shareholder voting rights reduce the CEOs' willingness to invest in the risky project. For conditionally binding voting rights, the difference is again small (0.94%) and insignificant but for unconditionally binding shareholder voting rights we observe a significant reduction of 40.59% (t = -18.38, p $<$ 0.000, two-tailed) in the proportion of risky project choices.

As an additional test for differences between treatments, we run a robust probit regression of dummy variables for the three voting right treatments on CEO project choice. The results of the probit regression are consistent with the mean difference tests shown in Panel A. Without

17 Indeed, mean executive compensation given that the CEO selects the risky project drops from 3,685 ECU in T_1 to 1,242 ECU in T_3. At the same time firm profit, given that P_2 is selected, increases from 16,429 ECU in T_1 to 19,459 ECU in T_3 due to the binding say on pay. See table A-3 in the appendix for details.

shareholder voting rights the probability of a risky project choice equals $\Phi^{-1}(1.7435) = 0.9594$, where Φ denotes the distribution function of the standard normal distribution. An introduction of unconditionally binding shareholder voting rights reduces the likelihood of a risky project choice to $\Phi^{-1}(1.7435 - 1.6091) = 0.5536$. Both coefficients are significant (z-score = 19.49 (-15.54), $p < 0.000$, two-tailed). We conclude that we cannot reject H1a, H1b or H1c.

This observation is consistent with the cross comparisons among the three different types of voting rights under consideration shown in Panel A of Table 5. In fact, moving from advisory to unconditionally binding voting rights reduces the average fraction of risky project choices by 40.28%, whereas converting an unconditionally into a conditionally binding voting right increases the mean proportion of risky project choices by 39.66%. Both mean differences are significant (t = -18.15 (17.71), $p < 0.000$, two-tailed). We also observe a small but insignificant difference between advisory and conditionally binding voting rights (-0.63%). Overall, these results suggest that unconditionally binding shareholder voting rights have a strong negative impact on the CEOs' investment incentives, whereas less restrictive forms of shareholder voting rights do not impede goal congruent project selection.

> **Result 1:** Shareholder voting rights impede goal congruence only if they are unconditionally binding.

We next analyze the impact of shareholder voting rights on CEO bonus proposals. The theoretical model suggests that rational and self-interested CEOs will always propose the highest possible bonus independent of the project outcome and of the shareholder voting rights regime in place. To measure the extent of the CEOs' self-interest, we relate the actual bonus proposals to the bonus ceiling for each of the two states. Panel A of Table 6 compares the mean difference in the relative size of bonus demands for successful and unsuccessful project outcomes.

[please insert Table 6 about here]

Average bonus demands for the successful project range from 68.29% of the maximum bonus of 5,000 ECU in T_3 to around 97% of the upper limit in T_2 (97.00%) and T_4 (97.02%). For unsuccessful projects, the mean bonus demands vary from 50.95% of the 1,000 ECU limit in T_3 to 89.61% for T_2. The third column of Table 6 shows the differences between relative bonus demands for good and poor project performance. It is positive and significant for all treatments and ranges from 7.39% in T_2 to a maximum of 41.85% in T_4 ($p < 0.000$, two-tailed for all cases). Although CEOs demand nearly the maximum bonus in two out of eight cases, these results contradict hypothesis H2a. Evidently, CEOs demand much higher bonuses for good than for bad outcomes but the difference appears to depend on the type of voting right in place.

Panels B and C of Table 6 show the impact of shareholder voting rights on CEO bonus demands for good and bad outcomes. The first line of Panel B indicates how shareholder voting rights influence bonus demands in previously unregulated jurisdictions. We observe that advisory voting rights increase the average bonus demand of CEOs by 4.73% for good states and by 9.19% for bad states. By contrast, unconditionally binding voting rights markedly reduce the CEOs' discretionary bonus proposals. The reduction equals 23.97% for good project outcomes and 29.47% for bad project outcomes. The effect of conditionally binding voting rights is ambiguous. It appears that they slightly increase bonus proposals for good performance (+4.76%) but considerably reduce compensation for poor results (−25.25%). All effects are significant ($p < 0.000$, two-tailed for all cases) and more pronounced for unsuccessful project outcomes. Panel C shows results of a robust regression of dummy variables for the three voting rights treatments on discretionary bonus proposals for good and bad states. The coefficients and t-values are consistent with the mean difference tests in Panel B. In addition, we find that the regression model explains 34.6% (22.06%) of the observed variance in project choice for good (bad) outcomes.

Lines 2 and 3 of Panel B show cross comparisons of the impact of different shareholder voting rights on CEOs' discretionary bonus proposals. The results indicate that moving from advisory to unconditionally binding voting rights significantly reduces the bonus proposals for both states. The reduction equals 28.70% for good project outcomes and 38.66% for bad project outcomes. Introducing conditionally binding instead of advisory voting rights has no impact on the bonus proposals for successful projects but it significantly reduces the bonus proposals for bad outcomes (−34.44%). Finally, moving from unconditionally to conditionally binding voting rights increases the bonus demands for both outcomes, where the difference for good results (28.73%) is considerably higher than for bad results (4.22%). All these differences are significant on a 1%-level ($p < 0.000$, two-tailed) except for the difference in bonus proposals for bad projects between unconditionally and conditionally binding voting rights that is significant on a 10%-level ($t=1.92$, $p <0.055$, two-tailed).

Overall, our results suggest that binding shareholder voting rights are indeed an effective instrument to curb executive compensation. CEOs tend to significantly reduce their bonus demands for a given project outcome whenever shareholders have binding voting rights. Evidently, the existence of credible threats on the part of shareholders has a disciplining role on CEOs' bonus proposals. This ex ante effect must be clearly distinguished from the direct reduction of the compensation due to binding shareholder disapproval. A possible behavioral explanation for the phenomenon is the hope that shareholders might be more willing to accept modest bonus proposals. Interestingly, the opposite effect seems to be caused by nonenforceable voting rights. In fact, the introduction of advisory voting rights appears to stimulate bonus demands for both outcomes. The same observation can be made for conditionally binding voting rights and successful project outcomes. These obser-

vations cannot be rationalized in the context of our theoretical model but our experimental results suggest that the announcement of an ineffective regulation can unintentionally provoke contrarian behavior.

> **Result 2:** (a) Binding shareholder voting rights are an effective instrument to curb executive compensation. (b) Nonenforceable voting rights induce higher bonus demands and higher executive compensation.

Next, we analyze the impact of different types of shareholder voting right regimes on voting behavior. Since CEOs and shareholders do not interact for more than one period, we expect that rational and self-interested shareholders reject the CEOs' bonus proposals whenever they have the right to do so. Panel A of Table 7 illustrates the impact of voting right types and project success on equilibrium votes. It shows the differences in average voting dissent between successful and unsuccessful projects and between advisory and unconditionally binding voting rights.

[please insert Table 7 about here]

The positive differences in the third column of Panel A indicate that shareholders reject CEO bonus proposals more often in case of a poor project performance. In fact, a negative project outcome increases voting dissent by 30.92% with advisory voting rights and does so by 8.89% with unconditionally binding voting rights. However, the difference is only significant for advisory votes ($t = 7.16$, $p < 0.000$, two-tailed). By contrast, enforceable voting rights increase the tendency to reject bonus proposals for good outcomes by 11.94%. The difference is significant ($t = 3.06$, $p < 0.002$, two-tailed). The effect for bad results has the opposite sign but it is not significant.

As an additional test for differences between treatments, we run a robust probit regression of dummy variables for the relevant voting right treatments on shareholder's voting dissent for successful and unsuccessful projects. The results of the probit regression are shown in Panel B of Table 7. The regression evaluates the impact of unconditionally and conditionally binding voting rights on shareholder's average voting dissent relative to advisory voting rights. With advisory votes, the average voting dissent equals $\Phi^{-1}(-0.2522) = 0.4004$ for successful projects and $\Phi^{-1}(0.5524) = 0.7097$ for unsuccessful projects. Both coefficients are significant ($p < 0.000$, two-tailed). The introduction of unconditionally binding shareholder voting rights increases the average voting dissent by 11.94% to $\Phi^{-1}(-0.2522 + 0.3020) = 0.5198$, the coefficient is significant (z-score = 3.05,$p < 0.002$, two-tailed). By contrast, a move from advisory votes to unconditionally and conditionally binding voting rights has no significant impact on the average voting dissent for unsuccessful projects.

Overall, our results suggest that shareholders actively use their voting rights to control CEO compensation. This observation holds regardless of the enforceability of the voting rights. It also

appears that shareholders are more willing to sacrifice a higher dividend to reward good performance whereas the majority of voters rejects bonus proposals in case of poor performance. Nevertheless, there remains a substantial fraction of shareholders that accepts the CEOs' bonus proposals in case of poor performance. This observation forces us to reject H2b.

> **Result 3:** A substantial fraction of shareholders rejects bonus proposals whenever they have the right to do so. The rejection rate is largely independent of the voting right regime in place (unconditionally binding, conditionally binding, or advisory) but increases with poor project performance.

Finally, we address the impact of shareholder voting rights on CEO compensation and firm profit. Panel A of Table 8 summarizes the mean differences for the two variables among the different voting rights.

[please insert Table 8 about here]

We find that the introduction of advisory or conditionally binding shareholder voting rights neither has a significant impact on executive compensation nor on firm profit. However, unconditionally binding shareholder voting rights significantly reduce average CEO compensation and firm profit. This observation holds for all pairwise comparisons between the four regulatory alternatives. The highest profit reduction ($-1,744.73$) can be observed when unconditionally binding shareholder voting rights are introduced in a previously unregulated jurisdiction. The highest reduction of CEO compensation ($-2,188.90$) and the lowest profit ($-1,388.68$) reduction result when advisory shareholder voting rights are replaced with unconditionally binding shareholder voting rights. Panel B shows results of a robust regression of dummy variables for the three voting rights treatments on CEO compensation and firm profit. The coefficients and t-values are consistent with the mean difference tests in Panel A. We also find that the regression model explains 20.26% of the observed variance in CEO compensation but only 0.90% of the observed variance in firm profit. These results are largely in line with the predictions from our theoretical model, so that we cannot reject H3a and H3b. However, since conditionally binding shareholder voting rights have no significant impact on CEO pay and firm profit, we must reject H3c.

> **Result 4:** (a) Advisory and conditionally binding shareholder voting rights have no significant impact on firm profit and executive compensation. (b) Unconditionally binding shareholder voting rights reduce both, firm profit and executive compensation significantly.

5 Summary and conclusions

We conduct an experiment to study the consequences of different shareholder voting right regimes on CEOs' investment incentives, shareholders' voting behavior, executive compensation, and firm profit. The experiment is based on a theoretical model in which a CEO must be motivated to take a goal congruent decision on a risky project on behalf of her shareholders. The CEO is privately informed about the probability of success and therefore essential for an efficient project choice. To induce a goal congruent project selection, the firm offers the CEO a bonus contract based on the realized project outcome. To make sense of shareholder voting rights, we let the CEO have some discretion over the size of her bonus. At the beginning of each period, the manager can make restricted bonus proposals in case of success and failure of the risky project. After the project outcome is realized, shareholders vote on the CEO's bonus proposal, provided they have the right to do so.

We consider three different types of shareholder voting right regimes and compare them to a traditional world in which shareholders have no say on pay. First, we study advisory shareholder votes on compensation. Second, we consider unconditionally binding shareholder votes where shareholders can reject the CEO's bonus regardless of the project's performance. Third, we consider conditionally binding voting rights where shareholders vote on the bonus proposal only in case of poor performance while having no say on the bonus in case of project success.

The theoretical analysis of equilibrium strategies under the four governance regimes suggests that no voting rights and advisory voting rights are economically equivalent. Since shareholders cannot influence compensation, the CEO always makes a goal congruent project choice but extracts the maximum possible compensation. In contrast, binding voting rights suffer from shareholders' moral hazard. Once the CEO has selected the risky project, dividend maximizing shareholders have a strict incentive to extract the CEO's bonus ex post. A rational CEO anticipates this strategy and chooses the risk-free project to avoid the expropriation of her bonus. The parties face a sequential prisoner's dilemma that reduces both, firm profit and executive compensation. This outcome can be avoided if binding voting rights are limited to poor performance. Since the CEO can still extract rents if the project is successful, she has goal congruent investment incentives if the expected bonus for a successful project is sufficiently large. We test our theoretical model in a laboratory experiment with 250 participants. Our experimental study largely confirms the predictions of the theoretical model and provides some additional insights. The findings can be summarized as follows:

- Advisory and conditionally binding voting rights do not distort CEOs' investment incentives. By contrast, binding voting rights undermine investment incentives and lead to goal incongruent project decisions.

- Only binding shareholder voting rights are an effective instrument to curb executive compensation. In contrast, advisory shareholder voting rights do not reduce compensation. We even find that nonenforceable voting rights have an adverse effect on executive pay. In fact, they seem to motivate CEOs to demand higher bonuses compared to the scenario where shareholders have no voting rights. The latter effect is small but statistically significant.

- A substantial fraction of shareholders rejects bonus proposals whenever they have the right to do so. This effect is largely independent of the voting right regime in place and it becomes more pronounced in case of poor project performance.

- We find that advisory and conditionally binding voting rights have neither a significant impact on compensation nor on profits. If shareholders have unconditionally binding voting rights, they are able to capture a larger fraction of the project's realized return. This in turn, discourages the CEO to invest in the risky project in the first place and forces her to choose the riskless project instead. The resulting net effect is negative so that unconditionally binding voting rights reduce both, executive compensation and profits.

Overall, our results suggest that regulators should carefully evaluate potential desirable and undesirable consequences of shareholder voting rights. Our study shows that advisory shareholder voting rights are ineffective in curbing executive compensation. In addition, they even bear the potential to stimulate excessive pay demands in poorly governed firms. Conversely, unconditionally binding voting rights are an effective instruments to curb executive pay. However, they also distort CEO investment incentives which results in reduced firm profits. These negative consequences can be avoided by conditionally binding voting rights. The latter regime effectively curbs executive pay in case of poor performance. Moreover, it does not undermine investment incentives if expected CEO rents in case of good performance remain sufficiently large. In our experiment, this condition is met because the maximum bonus in case of project failure is rather small as compared to the maximum bonus in case of project success. However, the more important expected rents of poorly performing projects become for the CEO's investments incentives, the more likely it is that conditionally binding voting rights will adversely affect the CEO's investment incentives.

We view our analysis as a first step towards a better understanding of the interplay among shareholder voting rights, investment incentives, executive compensation and firm profits. An obvious omission of our study is the analysis of multiperiod relations between management and shareholders. With repeated interaction between identical players, issues such as voluntary cooperation as well as reputational concerns might come into play and affect the efficiency of voting right regimes. In this study, we focused on the comparison of alternative voting right regimes while restricting the analysis to one-shot relationships. As a consequence, our results primarily apply to the relationship between management and short-term oriented equity investors. Nonetheless, we

think that multiperiod issues of shareholder voting rights as they arise between management and long-term investors are another interesting area for future research.

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Tables to be presented in the body of the paper

Tab. 1: Opportunity set and payoffs in Experimental Currency Units (ECU)

Project	State	Project return	Salary	Bonus	CEO pay	Firm profit
P1	-	10,000	2,000	0	2,000	8,000
P2	Success	25,000	0	0 – 5,000	0 – 5,000	25,000 - CEO pay
	Failure	5,000	0	0 – 1,000	0 – 1,000	5,000 - CEO pay

Tab. 2: Project choice and mean bonus proposals for successful and unsuccessful projects

Treatment	Type of voting right	Project choice		Mean bonus proposal	
		P_1 (riskless)	P_2 (risky)	Success	Failure
T1	None	26 (4.06 %)	614 (95.94 %)	4,613.14 (868.22)	804.17 (322.34)
T2	Advisory	28 (4.37 %)	612 (95.63 %)	4,849.82 (413.08)	896.06 (217.65)
T3	Unconditionally binding	259 (44.66 %)	321 (55.34 %)	3,414.61 (949.07)	509.50 (303.53)
T4	Conditionally binding	32 (5.00 %)	608 (95.00 %)	4,850.92 (478.40)	551.66 (342.52)
All		345 (13.80 %)	2,155 (86.20 %)	4,568.91 (839.78)	715.13 (339.35)

Table 2 shows absolute numbers of riskless and risky project choices and mean bonus proposals for successful and unsuccessful projects for all shareholder voting right regimes and the relevant sample. Relative percentages of risky and riskless project choices and standard deviations of bonus proposals are given in parentheses. Bonus proposals are measured in experimental currency units (ECU).

Tab. 3: Distribution of shareholder votes for successful and unsuccessful projects

Treatment	Type of voting right	Shareholder votes given project outcome			
		Project successful		Project failure	
		Vote = yes	Vote = no	Vote = yes	Vote = no
T2	Advisory	274 (59.96 %)	183 (40.04 %)	45 (29.03 %)	110 (70.97 %)
T3	Unconditionally binding	121 (48.02 %)	131 (51.98 %)	27 (39.13 %)	42 (60.87 %)
T4	Conditionally binding	–	–	39 (26.17 %)	110 (73.83 %)
All		395 (55.71 %)	314 (44.29 %)	111 (29.76 %)	262 (70.24 %)

Table 3 shows the absolute numbers of shareholder's acceptance and refusal decisions for all possible combinations of project outcome and shareholder voting right regimes. Relative percentages of yes and no votes for successful and unsuccessful projects are given in parentheses.

Tab. 4: Mean CEO compensation, firm profit and total welfare.

Treatment	Type of voting right	Mean CEO compensation	Mean firm profit	Mean total welfare
T1	None	3,617 (1,781)	16,086 (7,062)	19,703 (8,657)
T2	Advisory	3,770 (1,756)	15,730 (7,040)	19,500 (8,751)
T3	Unconditionally binding	1,581 (1,263)	14,342 (8,146)	15,922 (8,110)
T4	Conditionally binding	3,597 (2,061)	15,997 (6,678)	19,594 (8,676)
All		3,178 (1,957)	15,568 (7,258)	18,746 (8,698)

Table 4 shows Mean CEO compensation, firm profit and total welfare for all shareholder voting right regimes. Firm profit is CEO realized project return minus CEO compensation. Total welfare is firm profit + CEO compensation = project return. All values measured in experimental currency units (ECU). Standard deviations are given in parentheses.

Tab. 5: Impact of shareholder voting rights on project choice

Panel A: Mean differences in project choice

Treatment / Type of voting right	Advisory	Unconditionally binding	Conditionally binding
Baseline (No voting right)	-0.0031 (-0.28)	-0.4059*** (-18.38)	-0.0094 (-0.81)
Advisory	–	-0.4028*** (-18.15)	-0.0063 (-0.53)
Unconditionally binding	–	–	0.3966*** (17.71)

Panel B: Robust probit regression of treatment dummies on project choice

Treatment / Type of voting right	Coefficient	z-score	p-value
Baseline (No voting right)	1.7435	19.49	0.000***
Advisory	-0.0347	-0.28	0.781
Unconditionally binding	-1.6091	-15.54	0.000***
Conditionally binding	-0.0986	-0.81	0.420
Number of Observations and overall Significance	n = 2500	$\chi 2 = 467.38$	0.000***
McFadden's pseudo R^2	0.2530		

Panel A shows the mean differences in project choice between treatments/shareholder voting right regimes relative to the reference treatment given in the first column. Mean project choice is the percentage of risky project choices, t-values for mean differences are given in parentheses.

Panel B shows results for the robust probit regression of treatment dummies for the different shareholders voting right regimes on the project selection. The coefficient for the baseline treatment (no voting rights) is the constant of the regression. The coefficients for advisory, unconditionally binding and conditionally binding voting rights measure the marginal effect of the change in the shareholder voting right regime on the likelihood of risk project choice relative to the baseline treatment.

***, **, * Indicates significance at 0.01, 0.05, and 0.10, two-tailed, respectively.

Tab. 6: Impact of shareholder voting rights on discretionary bonus proposals

Panel A: Means and mean differences between relative size of discretionary bonus proposals

Treatment / Type of voting right	rbonus success	rbonus failure	difference	t-stats	p-value
Baseline (No voting right)	0.9226	0.8042	0.1185***	8.02	0.0000
Advisory	0.9700	0.8961	0.0739***	7.85	0.0000
Unconditionally binding	0.6829	0.5095	0.1734***	8.68	0.0000
Conditionally binding	0.9702	0.5517	0.4185***	29.02	0.0000
All	0.9138	0.7151	0.1987***	24.35	0.0000

Panel B: Mean differences in relative size of discretionary bonus proposals

Treatment / Type of voting right and bonus proposal	Advisory		Unconditionally binding		Conditionally binding	
	rbonus success	rbonus failure	rbonus success	rbonus failure	rbonus success	rbonus failure
Baseline (No voting right)	0.0473*** (6.10)	0.0919*** (5.85)	-0.2397*** (-18.87)	-0.2947*** (-13.80)	0.0476*** (5.94)	-0.2525*** (-13.27)
Advisory	–	–	-0.2870*** (-25.84)	-0.3866*** (-20.25)	0.0002 (0.04)	-0.3444*** (-20.95)
Unconditionally binding	–	–	–	–	0.2873*** (25.46)	0.0422* (1.92)

Panel C: Robust regression of treatment dummies on relative size of discretionary bonus proposals

Treatment / Type of voting right	rbonus success	t-stats	p-value	rbonus failure	t-stats	p-value
Baseline (No voting right)	0.9226	131.64	0.000***	0.8042	61.81	0.000***
Advisory	0.0473	6.10	0.000***	0.0919	5.85	0.000***
Unconditionally binding	-0.2397	-18.88	0.000***	-0.2947	-13.80	0.000***
Conditionally binding	0.0476	5.94	0.000***	-0.2525	-13.27	0.000***
Number of Observations and overall Significance	n =2155	F=238.05	0.000***	n=2155	F=231.43	0.000***
Percentage of Variance Explained (R^2)	34.60%			22.06%		

Panel A shows the means in relative size of CEOs' discretionary bonus proposals for successful and unsuccessful projects and the mean differences between the two for all treatments/shareholder voting right regimes and the relevant sample, given that the risky project was selected.

Panel B shows the mean differences in relative size of CEOs' discretionary bonus proposals for successful and unsuccessful projects between treatments/shareholder voting right regimes relative to the reference regime given in the first column. T-values for mean differences are given in parentheses.

Panel C shows results for robust regressions of treatment dummies for the different shareholders voting right regimes on CEOs' relative size of discretionary bonus proposals for successful and unsuccessful projects. The coefficient for the baseline treatment (no voting rights) is the constant of the regression. The coefficients for advisory, unconditionally binding and conditionally binding voting rights measure the marginal effect of the change in the shareholder voting right regime on CEOs' relative size of discretionary bonus proposals.

rbonus success = relative size of CEOs' discretionary bonus proposal for successful projects measured as a percentage of the maximum bonus of 5,000 experimental currency units (ECU).

rbonus failure = relative size of CEOs' discretionary bonus proposal for unsuccessful projects measured as a percentage of the maximum bonus of 1,000 experimental currency units (ECU).

***, **, * Indicates significance at 0.01, 0.05, and 0.10, two-tailed, respectively.

Tab. 7: Impact of shareholder voting rights on voting dissent

Panel A: Mean and mean differences in voting dissent for successful and unsuccessful projects

Treatment / Type of voting right	Project successful	Project failure	Difference in voting dissent relative to project success
Baseline (Advisory voting right)	0.4004	0.7097	0.3092*** (7.16)
Unconditionally binding	0.5198	0.6087	0.0889 (1.33)
Difference in voting dissent relative to voting right type	0.1194*** (3.06)	-0.1010 (-1.45)	–

Panel B: Robust probit regression of treatment dummies on voting dissent

Treatment / Type of voting right	vote success	z-score	p-value	vote failure	z-score	p-value
Baseline (Advisory voting right)	-0.2522	-4.25	0.000***	0.5524	5.18	0.000***
Unconditionally binding	0.3020	3.05	0.002***	-0.2765	-1.48	0.138
Conditionally binding	–	–	–	0.0855	0.56	0.578
Number of Observations and overall Significance	n=709	$\chi 2$=9.33	0.002***	n=373	$\chi 2$=3.74	0.154
McFadden's pseudo R^2	0.0096			0.0082		

Panel A shows the means and mean differences in voting dissent for successful and unsuccessful projects with advisory and unconditionally binding voting rights. Voting dissent is the percentage of No-votes to the CEOs' bonus proposals for a given voting right regime and project outcome (0.01 equals 1 %). Differences are determined relative to advisory voting rights and successful projects, t-values for mean differences are given in parentheses.

Panel B shows results for robust probit regressions of treatment dummies for the relevant shareholders voting right regimes on shareholders' voting dissent relative to the voting dissent for advisory shareholder voting rights. The coefficient for the baseline treatment (advisory voting rights) is the constant of the probit regression. The coefficients for unconditionally binding and conditionally binding voting rights measure the marginal effect of the change in the shareholder voting right regime on the likelihood of a no vote by shareholders.

Vote success = vote given a successful project outcome. The variable is coded as 1 if the shareholder has refused and 0 if the shareholder accepted the CEO's bonus proposal.

Vote failure = vote given an unsuccessful project outcome. The variable is coded as 1 if the shareholder has refused and 0 if the shareholder accepted the CEO's bonus proposal.

***, **, * Indicates significance at 0.01, 0.05, and 0.10, two-tailed, respectively

Tab. 8: Impact of shareholder voting rights of compensation and firm profit

Panel A: Mean differences in CEO compensation and firm profit between voting right regimes

Treatment / Type of voting right and bonus proposal	Advisory		Unconditionally binding		Conditionally binding	
	CEO comp	Firm profit	CEO comp	Firm profit	CEO comp	Firm profit
Baseline (No voting right)	152.92 (1.55)	-356.05 (-0.90)	-2,035.98*** (-23.19)	-1,744.73*** (-3.98)	-20.00 (-0.19)	-89.38 (-0.23)
Advisory	–	–	-2,188.90*** (-25.16)	-1,388.68*** (-3.17)	-172.92 (-1.62)	266.67 (0.70)
Unconditionally binding	–	–	–	–	2,015.98*** (20.81)	1,655.35*** (3.86)

Panel B: Robust regression of treatment dummies on CEO compensation and firm profit

Treatment / Type of voting right	CEO comp.	t-stats	p-value	Firm profit	t-stats	p-value
Baseline (No voting right)	3,616.67	51.38	0.000***	16,086.45	57.63	0.000***
Advisory	152.92	1.55	0.122	-356.05	-0.90	0.366
Unconditionally binding	-2,035.98	-23.19	0.000***	-1,744.73	-3.98	0.000***
Conditionally binding	-20.00	-0.19	0.853	-89.38	-0.23	0.816
Number of Observations and overall Significance	n=2500	F=321.30	0.000***	n=2500	F=6.41	0.000***
Percentage of Variance Explained (R^2)	20.26%			0.90%		

Panel A shows the mean differences in CEO compensation and firm profit between shareholder voting right regimes relative to the reference regime given in the first column. CEO compensation and firm profit are measured in experimental currency units (ECU), t-values are given in parentheses.

Panel B shows results for robust regressions of treatment dummies for the different shareholders voting right regimes on CEO compensation and firm profit. The coefficient for the baseline treatment (no voting rights) is the constant of the regression. The coefficients for advisory, unconditionally binding and conditionally binding voting rights measure the marginal effect of the change in the shareholder voting right regime on CEO compensation and firm profit.

CEO comp. = CEO compensation measured in experimental currency units (ECU).

Firm profit = firm profit measured in experimental currency units (ECU).

***, **, * Indicates significance at 0.01, 0.05, and 0.10, two-tailed, respectively.

Appendix: Miscellaneous Experiment Results

Tab. A-1: Breakdown of participants into treatments, sessions, and matching groups

Treatment	Session	Number of participants in matching group (MG)				Total	
		MG1	MG2	MG3	MG4		
T1	1	8	8	8	8	32	64
	2	8	8	8	8	32	
T2	1	8	8	8	8	32	64
	2	8	8	8	8	32	
T3	1	8	8	8	6	30	58
	2	8	8	8	4	28	
T4	1	8	8	8	8	32	64
	2	8	8	8	8	32	
Total number of participants						250	

Tab. A-2: Average payoff realized by CEOs and shareholders

Treatment	Type of voting right	Payoff	
		CEO	Shareholder
T1	None	45.09 (7.01)	20.36 (0.58)
T2	Advisory	46.88 (3.51)	19.90 (0.60)
T3	Unconditionally binding	20.58 (3.12)	18.26 (2.45)
T4	Conditionally binding	44.90 (3.66)	20.26 (0.66)
All	Mean (Standard deviation)	39.81 (11.58)	19.73 (1.53)
	Minimum Maximum	13.80 49.80	12.72 22.65

Table A-2 shows the mean payoff realized by the two different types of participants for all treatments. Standard deviations are reported in parentheses. The last line reports the minimum and maximum payoffs realized across all treatments. Payoffs were paid out in CHF and calculated on the basis of realized compensation and shareholder dividends during the experiment. For 1,000 Experimental currency units (ECU) participants received 0.60 CHF. In addition, each participant received a fixed participation fee of 0.60 CHF.

Tab. A-3: Mean CEO compensation, firm profit and total welfare given choice of risky project.

Treatment	Type of voting right	Mean CEO compensation	Mean firm profit	Mean total welfare
T1	None	3,685 (1,786)	16,429 (7,006)	20,114 (8,600)
T2	Advisory	3,851 (1,753)	16,084 (6,998)	19,935 (8,705)
T3	Unconditionally binding	1,242 (1,622)	19,459 (7,826)	20,701 (8,229)
T4	Conditionally binding	3,681 (2,081)	16,418 (6,588)	20,099 (8,610)
All		3,367 (2,046)	16,779 (7,104)	20,146 (8,576)

Table A-3 shows Mean CEO compensation, firm profit and total welfare for all shareholder voting right regimes given that CEO has chosen the risky project P_2. Firm profit is CEO realized project return minus CEO compensation. Total welfare is firm profit + CEO compensation = project return. All values measured in experimental currency units (ECU). Standard deviations are given in parentheses. The riskless project P1 yields compensation of 2,000 ECU, firm profit of 8,000 ECU and total welfare of 10,000 ECU.