

Incentive Effects of Subjective Allocations of Rewards and Penalties

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Abstract

We examine the incentive effects of subjectivity in allocating tournament-based rewards and punishments. We use data from a company where reward and punishment decisions are based on a combination of objective metrics and subjective performance assessments. Rankings based on the objective metrics and the ultimate payoff allocations are disclosed to all members of the organization. This information allows employees to observe whether and how managers subjectively override the objective rankings. Consistent with expectancy theory, we predict and find that subjective rewards and punishments manifesting as favorable (unfavorable) deviations from formula-based payoff expectations are associated with subsequent performance improvements (declines). These performance responses are incremental to the effects of receiving a reward or punishment per se. Our results suggest that managers can benefit from using subjective rewards but using subjective punishments can be very costly in the absence of sufficiently strong ex-ante incentive effects associated with the prospect of subjective penalties. Our findings contribute to the literature on subjectivity in performance evaluations and have important practical implications for designing incentive systems.

Keywords: subjectivity; tournament-based incentives; rewards; penalties; expectancy theory.

JEL codes: J33, M41, M52, M54

1. Introduction

A critical component in the design of a compensation contract is whether to frame the incentive mechanism as a reward or a penalty. Prior research shows that while employees prefer reward-framed contracts (Luft 1994), they exert more effort when facing the prospect of a penalty for underperformance (Hannan, Hoffmann, and Moser 2005; Hossain and List 2012; Van der Stede, Wu and Wu 2020). These studies, however, have examined bonuses and penalties that were *formula-based* – that is, cases when objective metrics and targets determined whether the employee would be rewarded or punished. This study examines how employees respond to reward and penalty decisions involving subjective adjustments to objective formulas.

Prior research describes several benefits of integrating subjective assessments in performance evaluation systems, especially when limitations of objective performance measures impede complete contracting. Agency theory depicts a world in which agents are fully rational and exhibit well-defined preferences (Baiman 1982, 1990). In contrast, behavioral studies suggest that cognitive limitations and biases may undermine the usefulness of subjective evaluations and discourage managers from using discretion (e.g., Bol 2011; Bol and Smith 2011; Bol, Hecht and Smith 2015). If rational employees were capable of fully processing supervisors' subjectivity as an informative signal complementing the information provided by incomplete objective performance measures (Holmström 1979), then the use of subjectivity should not give rise to any incremental incentive effect compared to formula-based reward and penalty decisions. However, in practice, employees' limited information processing capabilities lead them to pay more attention to activities that are measured more reliably than those for which the evaluation is more uncertain (Holmström and Milgrom 1991). Accordingly, employees rely predominantly on objective metrics clearly defined *ex-ante* in compensation contracts and verifiable *ex-post* to form expectations about their performance-related payoffs (Baker, Gibbons and Murphy 1994; Ittner, Larcker and Meyer 2003; Hallock, Madalozzo and Reck 2003).

Expectancy theory (Vroom 1964) posits that employees direct their effort toward activities to earn them desired outcomes (i.e., that are *instrumental* to obtaining expected outcomes) and attribute value to

these outcomes (i.e., different outcomes may have different *valence*). To the extent that employees base their payoff expectations on formula-based performance metrics and make corresponding effort choices, they subsequently experience subjective rewards (punishments) as favorable (unfavorable) deviations from expectations. These deviations from expectations impact the instrumentality link between performance and payoffs, leading employees to interpret supervisors' discretion as favorable or unfavorable *treatment* (Prendergast and Topel 1993), triggering reciprocal reactions (Akerlof 1982, 1984; Malmendier, te Velde and Weber 2014). Therefore, we hypothesize that employees experiencing subjective rewards (punishments) will reciprocate with subsequent improvements (declines) in objective performance.¹

Subjective rewards (punishments) may materialize as receiving an unexpected bonus (penalty) or as missing out on an expected penalty (bonus). Prior research (Thaler 1980; Bonner and Sprinkle 2002) suggests that outcomes involving actual monetary payoffs carry greater valence than formula-based payoffs' overrides. Therefore, consistent with expectancy theory, we hypothesize that the incentive effects associated with management's subjective adjustments to formula-based payoffs are more pronounced for outcomes with greater valence.

To test our predictions, we leverage data obtained from a manufacturing company that operates an incentive system whereby, at the end of each month, the best-performing department receives a monetary bonus, and the worst-performing department is penalized with a pay deduction. Top executives make the reward and punishment decisions based on objective performance information, which they can integrate with subjective assessments. The purpose of allowing discretionary adjustments is to encourage consideration of non-contractable employee behaviors that are not immediately reflected in objective performance metrics.² Importantly, the objective performance of all departments is disclosed organization-

¹ As we explain later in greater detail, because formula-based rewards and penalties correspond to (i.e., do not deviate from) employees payoff expectations, our prediction implies that performance responses to subjectively allocated rewards and penalties will be incremental to those associated with formula-based rewards and penalties documented in prior research (e.g., Van der Stede et al. 2020).

² Examples include organizational citizenship behaviors such as actions that are aligned with corporate values and/or contribute to the establishment of a common organizational identity (Katz 1964). The psychology literature refers to such actions also as "extra-role behaviors" (see, for example, Wright et al. 1993). We provide more details about the type of behaviors that are evaluated subjectively in our setting in Section 3 and Appendix 2.

wide via a dashboard of metrics which are updated regularly throughout the month. The ultimate recipients of rewards and penalties are also publicly announced. Therefore, the objective performance measures provide employees with a basis to form their expectations about the likely recipients of bonuses and penalties, which they can then compare to actual outcomes. This information allows employees to detect whether and how top management's discretion resulted in subjective rewards or punishments (i.e., deviations from formula-based outcomes).

Consistent with our first hypothesis, we find that departments experiencing subjective rewards (punishments) improve (reduce) objective performance in the following month. Furthermore, we find that ex-post incentive effects associated with subjective rewards and punishments are *incremental* to employees' performance responses to formula-based bonuses and penalties, which correspond to expected payoffs. That is, we document evidence that employees' motivation is influenced by the subjective allocation *process* of performance-related payoffs and not just by the *outcome*.

We leverage our field setting to identify four types of subjective adjustments that carry different levels of outcome valence. Subjective rewards include (1) departments that receive a monetary reward without attaining the highest score on objective metrics (*Subjective Bonus*) and (2) departments that *do not* receive a monetary penalty despite ranking last based on objective metrics (*Subjective Penalty Override*). Subjective punishments include (3) departments that receive a monetary penalty without attaining the lowest score on objective metrics (*Subjective Penalty*), and (4) departments that *do not* receive a monetary reward despite ranking first based on objective metrics (*Subjective Bonus Override*).³ Consistent with our second hypothesis, we find that the incremental incentive effect associated with subjective rewards and punishments is stronger for outcomes with greater valence (i.e., *Subjective Bonus* and *Subjective Penalty*).

We then examine management's *decisions* to reward or punish subjectively. In our setting, managers must decide at the end of every month (1) whether to award the bonus (penalty) to a department that does not rank first (last) and (2) whether to deprive the department that ranks first (last) of their formula-

³ We summarize our constructs in Figure 1 – Panel A.

based outcome. Therefore, to compare the incentive effects of subjective adjustments versus formula-based reward/penalty decisions, we combine the performance response to the *Subjective Bonus (Subjective Penalty)* and the response to the *Subjective Bonus Override (Subjective Penalty Override)*. We find that a *decision* to reward subjectively leads to greater positive performance responses than those triggered by formula-based rewards. In contrast, a *decision* to punish subjectively is associated with negative performance responses whose magnitude is not different from the ex-post detrimental effects of a formula-based penalty. Collectively, our results suggest that the use of discretion to override formula-based rankings is associated with favorable performance responses when rewarding employees, but not necessarily when punishing them.⁴

We conduct additional analyses to further validate and extend our empirical results. The documented performance effects for *Subjective Bonus (Subjective Penalty)* could be explained by employees strategically shifting effort between measurable and unmeasurable activities, thereby “borrowing output” between periods. However, our tests show no evidence of such behavior. Additionally, we find that employees who observe subjective treatments of others but do not directly experience any subjective reward or punishment (i.e., non-treated departments) do not exhibit any significant performance responses. This finding suggests that the ex-ante incentive effects of subjective allocations of rewards and punishments are relatively weak in our setting.

Our study contributes to the literature on the role of subjectivity in incentive contracts in the following ways. First, we extend prior work on the effects of rewards and penalties, in particular the result recently documented by Van der Stede et al. (2020), whereby rewards and penalties influence performance not only via future payoff prospects but also via ex-post behavioral effects. Our results show that managerial discretion in rewarding or punishing employees has incremental motivation effects compared to formula-

⁴ Specifically, the use of subjective punishments should be informed by an assessment of ex-ante incentives associated with such treatment. The potential favorable ex-ante incentive effect of the prospect of a subjective punishment may outweigh the unfavorable ex-post performance response to experiencing subjective punishments, resulting in overall positive performance effects. We acknowledge that, in our setting, we cannot observe and fully quantify the ex-ante incentive effects of subjective rewards and penalties. We discuss this more in Section 5.3.

based allocations. Managers should leverage subjective rewards but use subjective punishments only when they expect sufficiently strong positive ex-ante incentive effects from including punishment provisions in their incentive design. Second, we extend prior research on the relation between subjective allocations of performance-related payoffs and subsequent performance. Prior studies interpret the observed relationship primarily as evidence consistent with an information-based explanation, whereby managerial discretion is *predictive* of future performance (e.g., Hayes and Schaefer 2000; Gibbs, Merchant, Stede and Vargus 2004; Ederhof 2010). Our findings suggest that the use of subjectivity in payoff allocations may also relate to subsequent performance through a motivation effect, whereby the use of managerial discretion *affects* future performance. Finally, our findings provide novel justifications for the underuse of subjectivity in practice. Prior research has suggested several factors that may impede managers' subjectivity in incentive contracts, including concerns related to fairness and unwanted motivational effects. While the literature has discussed this possibility (e.g., Moers 2005, Bol et al. 2015), to the best of our knowledge, our study is the first to provide empirical field evidence of ex-post incentive effects of subjective performance evaluation and compensation practices in the presence of readily available objective metrics.

2. Theory and Hypothesis Development

2.1. Rewards and Penalties in Incentive Contracting

Prior research has examined the incentive effects of contracts framed as rewards or penalties. Consistent with prospect theory (Kahneman and Tversky 1979), Luft (1994) found that individuals prefer contracts framed as rewards to economically equivalent contracts framed as penalties. Building on this evidence, Hannan et al. (2005) examined the influence of contract framing on workers' effort and found that, although employees judged penalty-framed contracts to be less fair, they elicited greater individual effort compared to equivalent bonus-framed ones. Leveraging a natural experiment in a field setting, Hossain and List (2012) extended this result to teams and documented its persistence over time. That workers dislike penalty-framed contracts, however, remains an important factor that managers need to consider when designing control systems. Christ, Sedatole, and Towry (2012) examine an incomplete contracting setting, whereby subordinates are asked to perform two tasks. One task is explicitly linked to

an incentive payout – framed as a reward or a penalty – and the other task is linked to an additional reward subjectively determined by the principal. The authors find that employees, for whom the complete portion of the contract was framed as a penalty, expressed less trust in the principal to reward them accordingly for the task linked to the incomplete portion of the contract and, thus, exhibit less effort in that particular task.

The studies mentioned above approached their examinations from the viewpoint of an employee facing the *prospect* of a reward or a penalty, thus shedding light on the *ex-ante* motivation effects of rewards and penalties in incentive contracting. Because employment contracts resemble repeated, multi-period games, understanding the *ex-post* influence of rewards and penalties is also important. Van der Stede et al. (2020) leveraged a field setting to examine employees' performance responses to experiencing formula-based bonuses or penalties. They found that employees responded with greater effort and performance improvements after receiving a penalty than a bonus. Additionally, they found that the marginal sensitivity to the bonus amount was higher than to the penalty amount. However, they also observed higher turnover rates, especially for skilled workers, associated with penalty-framed contracts compared to bonus-framed ones. This result points to employees experiencing disutility when operating under a penalty-framed contract. In sum, while prior studies concur that penalty-framed contracts drive workers' effort, there is also evidence of psychological factors (e.g., perceptions of unfair treatment, low trust in the principal, increased intentions to leave) that managers should consider to avoid adverse performance effects, especially in the long term.

We extend the inquiry on the *ex-post* incentive effects of monetary rewards and penalties to a setting in which there is incomplete contracting and managers have discretion over the allocation of bonuses and penalties. As we explain next, we posit that subjective rewards and punishments give rise to incremental incentive effects compared to formula-based rewards and punishments, which, in turn, affect subsequent effort and performance.

2.2. Subjectivity in Incentive Contracting

An extensive body of research examines the benefits and costs of subjectivity in performance evaluations. A significant advantage of using subjectivity is explained by agency theory. The optimal

contract should be based exclusively on performance measures that inform about agents' effort and align the agents' effort to their payoffs (Holmström 1979). Yet, objective performance measures' limitations impede the achievement of first-best contracts. For example, objective performance measures may be subject to noise originating from uncontrollable events and thus may inaccurately capture agents' effort (e.g., Banker and Datar 1989). Moreover, many readily available objective performance metrics tend to direct agents' attention primarily towards short-term results, thus ignoring unmeasured activities that may convert into actual performance only in the long-term (e.g., Baker et al. 1994). According to theory, subjectivity in performance evaluations benefits managers because it contributes to a more accurate representation of employees' effort, thus strengthening the link between effort and payoffs within the incentive contract. However, despite these potential benefits, empirical research finds that subjective performance evaluations are used less often than theory would predict. For example, based on a hand-collected sample of CEO incentive contracts, Höpfe and Moers (2011) report that CEOs were awarded discretionary bonuses in only about 20% of those cases. In addition, Bol et al. (2015) document that supervisors justify their resistance to use subjectivity in rank-and-file subordinates' evaluations with concerns about the impact of perceived unfairness on employees' future motivation. In particular, supervisors were less likely to apply discretionary adjustments when a positive adjustment to one set of employees was accompanied by a missed adjustment for others, who could interpret it as a negative outcome.

Whereas there is abundant evidence of factors influencing *supervisors'* propensity to use subjectivity (e.g., Bol 2011; Bol and Smith 2011; Bol et al. 2015), empirical research examining how *employees* respond to supervisors' discretionary adjustments is relatively scant. If supervisors and employees were fully rational, as predicted by agency theory, supervisors' subjective adjustments to compensation decisions should only occur to better assess employee effort and determine the associated remuneration when objective metrics alone cannot accurately capture performance. In turn, rational employees should impound the expected value of subjective adjustments in their compensation expectations. Rational employees should interpret managers' subjective adjustments as an improvement in

the mapping between effort and pay compared to relying solely on objective metrics. Thus, there should be no concern about the fairness of subjective adjustments (Baiman 1982, 1990). If, instead, employees are subject to cognitive limitations when interpreting supervisors' decisions, then subjective adjustments may distort their perception of the relation between performance and outcomes, thus impacting their subsequent effort choices. Prior research shows that supervisors are susceptible to biases and cognitive limitations resulting in inaccurate performance assessments (Bol 2008). For example, supervisors may renege on their promise to subjectively reward observed behaviors, which are non-contractible and therefore not enforceable in court, thus severely undermining the credibility of the incentive system in the eyes of the employees (Prendergast and Topel 1993). Using field data from a financial service provider that newly introduced an incentive system including subjective performance evaluations, Bol (2011) finds that managers were subject to both centrality bias (i.e., the tendency to compress performance ratings toward the middle of the scale) and leniency bias (i.e., the tendency to inflate performance ratings). Research also documents several contextual factors influencing supervisors' susceptibility to cognitive biases. For example, in an experimental study, Bol and Smith (2011) show that supervisors' subjective evaluations are influenced by the level of performance captured by readily available objective performance measures, so that higher objective performance leads to more favorable subjective evaluations. Additionally, the authors document that subjective evaluations were higher when stochastic events impacted objective performance negatively but were not lower when stochastic events favored objective performance.

In sum, the literature shows that supervisors' biases and cognitive limitations can undermine the effectiveness of the incentive system by weakening the relation between effort and payoffs as perceived by the employees. Prior research has conjectured that experiencing subjective compensation decisions may affect employees' subsequent motivation. However, research directly examining this prediction is scant. Our study contributes to closing this gap. As we explain next, we posit that subjectivity affects employee motivation when experienced as a favorable or unfavorable deviation from expected payoff outcomes.

2.3. Rewards and Penalties Involving Subjectivity

According to expectancy theory, individuals make choices to maximize their satisfaction with the expected outcomes (Vroom 1964). The underlying process comprises three elements: expectancy, instrumentality, and valence. Expectancy is the belief that exerting effort will result in corresponding performance levels; instrumentality refers to the belief that an individual will obtain the expected outcome corresponding to their performance; valence refers to the value an individual places on the resulting outcomes. Whereas expectancy and valence stem from beliefs and perceptions internal to the individual, instrumentality is heavily dependent on supervisors' payoff allocation decisions. Because employees dedicate more effort to activities that are more clearly measured, verifiable, and rewarded (Holmström and Milgrom 1991), available objective performance metrics likely constitute the reference point for employees' payoff expectations. If so, employees may experience subjective adjustments determining compensation outcomes as *deviations* from payoff expectations. Employees possess only limited information about the reasons underlying managements' subjective adjustments to formula-based reward and penalty decisions. Therefore experiencing deviations from expected outcomes affects the instrumentality link between performance and payoffs, which, in turn, influences subsequent effort choices.

The directional response to subjective adjustments in reward and penalty decisions depends on whether the resulting outcomes deviate positively or negatively from employees' expectations. Research posits that employees perceive subjective adjustments resulting in better (worse) outcomes than expected as favorable (unfavorable) *treatment* by their supervisors (Prendergast and Topel 1993) and reciprocate by adjusting subsequent effort choices to rebalance the exchange (Akerlof 1982, 1984; Malmendier et al. 2014; Fehr and Schmidt 2006; Falk and Fischbacher 2006; Krueger and Mas 2004). Therefore, if subjectivity gives rise to favorable (unfavorable) deviations from expected payoffs, and employees respond reciprocally, managers are likely to benefit from subjective allocations of rewards but should avoid subjective punishments.⁵

⁵ The caveat about considering the incentive effects stemming from the prospect of receiving a subjective penalty remains.

Van der Stede et al. (2020) recently documented the incentive effects of experiencing formula-based rewards and penalties. Because management did not have the authority to change those outcomes in their setting, receiving a bonus or a penalty likely did not affect the instrumentality link between performance and pay. We posit that subjective rewards and punishments, by deviating from formula-based outcomes, impact such link and give rise to incremental ex-post incentive effects beyond simply receiving a bonus or penalty. We formalize our first hypothesis as follows:

Hypothesis 1: *Subjective rewards (punishments) are associated with better (worse) performance responses compared to formula-based rewards (punishments).*

As mentioned, expectancy theory posits that the valence of outcomes is associated with significant motivational effects (Vroom 1964). Behavioral research suggests that monetary payoffs assume greater valence than corresponding non-monetary outcomes (Thaler 1980; Bonner and Sprinkle 2002). Therefore, we expect a stronger performance response when subjective adjustments result in allocating a bonus or penalty compared to the deprivation of a bonus or relief from a penalty. We formalize our second hypothesis as follows:

Hypothesis 2: *Employee performance responses to subjective rewards and punishments are stronger for outcomes with greater valence.*

3. Research Setting

We test our hypotheses using data obtained from a Chinese manufacturing firm that incentivizes performance of its 11 departments using a tournament incentive system that involves monetary rewards and penalties.⁶ The organization of departments corresponds to different phases of the firm's production process. Departments are comparable in terms of size and task difficulty. For the most part, department teams are stable throughout our sample period, and each team continues to perform the same activities.

⁶ Interviews with management confirmed that this was the only incentive program for department operational performance at the site during our sample period. That is, workers would receive performance-related bonuses (penalties) only if they were part of the best (worst) performing department in that month. Management wanted to instill a culture of collaboration and teamwork. Therefore, no individual performance bonuses or penalties were available at the site during our sample period.

Overall department performance is evaluated based on a combination of operational performance and organizational behaviors. At the end of each month, the members of the department with the highest performance receive a bonus, while the members of the worst-performing department are penalized with a pay deduction.⁷ Operational performance of each department is measured by a set of objectively quantifiable metrics along four dimensions of performance: financial, non-financial, innovation, and compliance.⁸ At the beginning of each fiscal year, top corporate executives set quantifiable monthly targets for all objective metrics. Targets are selected based on previous-year performance and expected sales volumes for the upcoming year and consider differences in departments' activities, interdependencies, and contribution to the firm's overall performance. Target levels are intended to be challenging.⁹ Nonetheless, departments participate actively in the target-setting process to ensure fairness, equity, and transparency across departments. That is, while targets are department-specific, the negotiation process ensures that they are all equally challenging. Accordingly, final targets reflect consensus between management and workers in terms of congruence with strategic goals and level of difficulty across all departments. Based on the annual targets, each department is assigned explicit targets for each of the 12 months. Targets are not renegotiated until the next annual target-setting cycle. Performance against target is measured using a points system, whereby departments meeting all their targets for the month earn 100 points. The points system serves as a calibration device allowing management to compare performance across departments performing different functions. Performance points are prorated to reflect the deviation from target, and departments can score more than 100 points if they exceed their assigned targets.¹⁰ All metrics, targets, and

⁷ Bonuses and pay deductions apply only to the month in which they are assigned. The reward (penalty) is applied immediately and results in a higher (lower) take-home amount for that month. The amounts of bonuses and penalties are similar and correspond to about twelve percent of the average individual monthly salary.

⁸ See Appendix 1 for an example. The site did not share with us detailed information (i.e., targets or actual performance) on the metrics associated with the four dimensions, beyond what we include in the notes to Appendix 1. While metrics associated with each dimension may vary depending on the activities performed by the department, dimensions and associated relative weights within the department performance score are, however, uniform across departments. Appendix 1 provides an example of the calculation of a department's performance score.

⁹ Management's intention was to push for continuous improvement and believed stretch targets to be an effective device to signal that "more could always be done."

¹⁰ Consistent with the notion that "more could always be done", management did not offer bonuses for reaching the target. Bonuses would be assigned only to the best department and punishments to the worst performing department in the month (as described the tournament incentive system described in our paper).

actual performance are publicly disclosed across the organization via department-level dashboards that are frequently updated throughout the month.

These output metrics comprise the objective component determining the final reward/penalty allocations. However, as we describe next, management also uses subjective adjustments to account for organizational behaviors that are not captured by the objective component of the evaluation.

3.1. Subjectivity in Performance Evaluations

Because of a concern that relying purely on objective output metrics may not account for other important behaviors beneficial to overall long-term organizational performance, management can integrate subjective performance assessments into their final bonus and penalty allocation decisions. These subjective adjustments can therefore result in giving bonuses (penalties) to departments that did not rank first (last) based on objective performance metrics (i.e., subjective overrides). Management also has discretion to give bonuses (penalties) to none, one, or multiple departments in the same month. During field interviews, management explained that the primary purpose of allowing subjective adjustments is to encourage consideration of employee behaviors that are valuable for the organization but unlikely to be directly captured by the objective performance metrics. Additionally, while there are no pre-set policies concerning the criteria that should drive these subjective assessments, they tend to pertain to employee morale, attitude, and dedication to the company. In other words, the executives described subjective evaluations as a means to reward *how* the job was done, above and beyond its measurable output.¹¹

This use of subjectivity differs from what prior empirical studies reported about the relation between discretionary rewards and CEO's future performance (e.g., Hayes and Schaefer 2000; Ederhof 2010). These studies document an association between boards' subjective allocations of rewards to the CEO and future objective performance. Their interpretation is that boards reward current non-contractible performance reflected in future objective performance metrics. In other words, any subjective bonus adjustment by the board to reward behaviors that can affect long-term organizational performance is likely

¹¹ Appendix 2 includes examples from field interviews of how management used subjectivity at our research site.

to be reflected in the performance metric itself.¹² CEOs are typically evaluated on coarse organization-wide performance measures impacted by activities performed by multiple employees under their leadership. Therefore, CEOs can influence these activities in ways that are not immediately captured by the objective performance metrics specified in their compensation plan.¹³ In contrast, performance in our research setting is a summary measure of volume-based metrics pertaining to assigned execution tasks. Therefore, there are very limited ways, if any, in which employees can enact activities – beyond their task execution - in one period that will be immediately reflected in objective performance metrics in the next period. Additionally, because of the multidimensional nature of the objective performance measurement system, it is extremely unlikely that workers can strategically “move” output between months (e.g., increasing production at the expense of required preventive maintenance). We address this latter point further in Section 5.2.

3.2. Worker Expectations and Deviations

As described, objective metrics capturing operational performance of each department are periodically updated and publicly disclosed organization-wide throughout each month of production. This feature of our setting, which is common to many manufacturing organizations, allows workers to form expectations about the performance rankings of each department based on the objective metrics. Additionally, at our site, the possibility to integrate subjective performance assessments in the tournament-based bonus/penalty allocation decisions was introduced at the beginning of our sample period.¹⁴ Therefore, workers in our setting do not have prior experience with managerial subjectivity that could inform their expectation-formation process. When management announces which departments are rewarded and penalized at the end of each month, their use of subjective evaluations becomes visible to all workers. From

¹² Specifically, Hayes and Schaefer (2000) document how variation in current compensation that is not explained by current performance predicts future performance by regressing future ROE on current performance variables and current log of total cash CEO compensation. Ederhof (2010) further refines this approach by documenting how discretionary bonuses, which are based on non-contractible performance measures, predict future performance.

¹³ Ederhof (2010) provides examples of these non-contractible activities, such as (p. 1922) “whether the agent negotiated new deals with major customers or suppliers that are likely to pay off in the future; whether the agent implemented important strategic initiatives.”

¹⁴ This innovation was introduced by a new top management team brought about by a merger involving our site. The merger was friendly and resulted in no major disruption to operational processes, or size of the workforce. We do not have access to any performance data prior to the merger.

the workers' perspective, when the bonus (penalty) recipients are not the department at the top (bottom) of the objective ranking, managers' subjectivity practically equates to overriding the objective performance rankings.¹⁵ Monthly town hall meetings, during which site performance is presented and discussed interactively, allow workers to inquire about the criteria used to determine the most recent rewards and penalties.¹⁶

Given the characteristics of our setting, we can distinguish between four types of deviations from workers' expectations due to subjective overrides that correspond to experiencing either a reward or punishment, as shown in Panel A of Figure 1. Departments experiencing a subjective reward either receive a *Subjective Bonus* or experience a *Subjective Penalty Override*. Specifically, departments experiencing a *Subjective Bonus* receive an actual monetary bonus without attaining the highest score on objective metrics. Departments experiencing a *Subjective Penalty Override* do *not* receive a penalty despite ranking last in the objective rankings. In contrast, subjectively punished departments either receive a *Subjective Penalty* or experience a *Subjective Bonus Override*. Specifically, departments experiencing a *Subjective Penalty* receive a pay cut without attaining the lowest score on objective metrics. Departments experiencing a *Subjective Bonus Override* do *not* receive a bonus despite ranking first based on objective metrics. The two different classifications of subjective rewards and punishments are important for our analysis of the effect of subjective outcome valence on employees' performance responses formalized in our second hypothesis.¹⁷

In Panel B of Figure 1, we summarize the four different deviation types using a hypothetical example including only six departments. The ordering in the left column represents the ranking based on objective metrics. Assume that management's subjective adjustments resulted in final bonus/penalty

¹⁵ In many cases, subjective evaluations may result in allocations of rewards and penalties that correspond to the objective rankings. This does not mean that subjective assessments were not performed, but it makes them invisible to the employees. Thus, from the employees' viewpoint, managerial subjectivity is only visible when it results in deviations from reward/penalty allocations that would have resulted from the objective rankings in absence of subjectivity.

¹⁶ A town hall meeting in our field setting refers to a site-wide meeting involving all workers.

¹⁷ Appendix 2 additionally maps the different classifications to each provided example.

allocations as described in the right column of the diagram. The subjective override results in a bonus for the second-ranked department and deviates favorably from expectations purely based on the objective ranking (*Subjective Bonus*). Similarly, for the fifth-ranked department, the subjective override results in a penalty, which deviates unfavorably from expectations purely based on the objective ranking (*Subjective Penalty*). Additionally, the departments that ranked first and last in the left columns based on objective performance are deprived, respectively, of the bonus (*Subjective Bonus Override*) and the penalty (*Subjective Penalty Override*) they would have received in the absence of subjective overrides. The remaining departments did not expect to receive a reward or a punishment, and they did not receive any – i.e., they did not experience any deviation from their payoff expectations. We note that, should the department ranked first (last) in the left column of the diagram receive the bonus (penalty), they would also not have experienced any deviation from expectations.

----- Insert Figure 1 here -----

3.3. Data

Our sample consists of monthly data (25 months over three years from 2014 to 2016) for each of the firm's 11 departments. Table 1 reports the descriptive statistics. Our unit of analysis is the department.¹⁸ We measure performance via the monthly department-level total performance score (*PerfScore*), which is on average about 63.5 points during our sample period, thus reflecting the aforementioned challenging levels of assigned targets and leaving significant room for improvement to department teams. As described, each department is assigned targets on multiple objective performance metrics, and achieving all assigned targets awards a department 100 points. However, departments can exceed expectations on one or more metrics and earn total scores greater than 100, as evidenced by the maximum value of *PerfScore* (107

¹⁸ We acknowledge that the cited theories refer to individual behavior, whereas our unit of analysis is a department. While, in our setting, we cannot control for intra-group dynamics, we follow Abernethy et al. (2020) and assume that the performance observed at the department level represents the average individual response to the use of managerial discretion in the allocation of performance-related payoffs. Additionally, Hossain and List (2012) demonstrated that collective behavior in the presence of incentive contracts framed as rewards or penalties was parallel to individual behaviors.

points).¹⁹ Performance is subject to significant variation: the standard deviation is about 17 points, and the interquartile distance is 23 points.

We construct four indicator variables to capture the four types of deviations from workers' expectations due to subjective overrides shown in Figure 1. *SubBonus* (*SubPenalty*) is an indicator variable equal to 1 if a department is given a bonus (penalty) despite not ranking first (last) in the objective rankings and zero otherwise. *SubPenaltyOverride* (*SubBonusOverride*) is an indicator variable equal to 1 if the department is *not* given a penalty (bonus) despite ranking last (first) in the objective rankings and zero otherwise. *SubReward* is an indicator variable equal to 1 if workers in the department experienced a *favorable* deviation from their expectations due to subjective overrides (i.e., departments that either experienced *SubBonus* or *SubPenaltyOverride*) and zero otherwise. *SubPunishment* as an indicator variable equal to 1 if workers in the department experienced a favorable deviation from expectations due to subjective overrides (i.e., departments that either experienced *SubPenalty* or *SubBonusOverride*) and zero otherwise. All variables are defined in Appendix 3.

As Table 1, Panel A, shows, during our sample period, the average department's probability of receiving a bonus (penalty) is 8.7% (10.9%). Subjective overrides of bonuses (penalties) have a 4.4% (4.7%) probability on average, which suggests that subjective deviations from formula-based allocations occur about half of the times rewards and penalties are assigned. Subjective overrides result in departments missing out on a bonus (penalty) with a probability of 2.9% (4.7%). Collectively, the average department experiences subjective rewards (punishments) with a probability of 7.3% (9.5%).²⁰

Table 1, Panel B, reports descriptive statistics about the number of rewards, penalties, and subjective treatments during our sample period at the department level. Departments receive on average 2.2 (2.7) rewards (penalties), of which 1.1 (1.6) correspond to formula-based outcomes, and 1.1 (1.2) are determined subjectively. Departments are also saved from a formula-based penalty 0.7 times and deprived of a formula-based reward 1.2 times. Perusal of our data does not indicate specific patterns of subjective

¹⁹ That is, objective performance measures in our setting are therefore not subject to upper bound censoring.

²⁰ Recall that management has the discretion to assign zero, one, or more rewards and penalties in each month.

treatments. That is, we do not find any evidence that certain departments received the same subjective treatment significantly more often than others or were never rewarded or penalized.²¹ Every department in our sample experienced some type of subjectivity in at least one month, but not all of them experienced both subjective rewards and subjective punishments.

----- Insert Table 1 here -----

4. Empirical Analyses

4.1. Test of H1: Subjective Rewards and Punishments as Deviations from Expectations

Our first hypothesis predicts that subjective rewards or punishments (i.e., subjective adjustments leading to favorable or unfavorable deviations from formula-based payoffs) are associated with incremental employee performance responses compared to formula-based rewards and penalties. We test this hypothesis by estimating the following equation:

$$\begin{aligned} PerfScore_{i,t} = & \alpha + \beta_1 ObjBonus_{i,(t-1)} + \beta_2 ObjPenalty_{i,(t-1)} + \beta_3 SubReward_{i,(t-1)} + \\ & + \beta_4 SubPunishment_{i,(t-1)} + \beta_5 PerfScore_{i,(t-1)} + \\ & + \sum_{k=1}^{11} \beta_k k.Rank_{i,(t-1)} + Fixed\ Effects + \varepsilon \end{aligned} \quad (1)$$

where the dependent variable $PerfScore_{i,t}$ captures the level of objective performance of department i in month t . $ObjBonus_{i,(t-1)}$ ($ObjPenalty_{i,(t-1)}$) is an indicator variable equal to one if department i received a bonus (penalty) and ranked first (last) in month $(t-1)$, and zero otherwise. $SubReward_{i,(t-1)}$ ($SubPunishment_{i,(t-1)}$) is an indicator variable equal to one if department i experienced a favorable (unfavorable) deviation from payoff expectations due to management's subjective adjustments in month $(t-1)$, and zero otherwise. All variable definitions are summarized in Appendix 3. The control group for this analysis comprises departments that did not experience a reward or punishment of any kind.

We include lagged objective performance ($PerfScore_{i,(t-1)}$) among our predictors to obtain estimates of *changes* in performance associated with workers experiencing rewards and penalties assigned either subjectively or based on objective formulas (Cronbach and Furby 1970; Keele and Kelly 2006). We control

²¹ We also have no evidence of subjective treatment being used to “break a streak” of rewards or penalties. For example, if a department receives more than one objective penalty in a row, this is not followed by an objective penalty override to “save” the department from receiving the penalty again.

for the incentive effect of relative performance information arising from the objective ranking in the prior period (i.e., the period in which performance was evaluated) by including indicator variables $k.Rank$ for each k^{th} ranking in a given period, where k is an integer defined between 1 and 11. Prior research on repeated and dynamic tournaments has documented incentive effects associated with relative rankings in addition to incentive effects associated with tournament-related compensation. Tournament rankings provide information about relative ability (Berger et al. 2013), relative status (Tran and Zeckhauser 2012), and the probability of winning future tournaments (Casas-Arce and Martinez Jerez 2009). Additionally, Berger et al. (2013) show that, in repeated tournaments, relative rankings among the non-winners affect subsequent performance through giving-up behaviors, which, they find, are not concentrated among the lowest-scoring workers but are also observed among workers close to the threshold for winning the reward. Tran and Zeckhauser (2012) show that individuals have inherent preferences for high rankings and that information about previous rankings influences subsequent performance. Examining a dynamic multi-period tournament structure, Genakos and Pagliero (2012) document that individuals closer to the top underperform compared to lower-ranked competitors. In similar dynamic tournament settings, Casas-Arce and Martinez Jerez (2009) provide evidence of complacency effects for those who rank at the top in interim rounds of the tournament and giving-up effects for those ranking at the bottom. Rank-related incentive effects are likely especially pronounced in our setting as the availability of dashboards of objective metrics allows all tournament participants to assess their relative performance throughout the tournament period. We also include department fixed effects to account for unobservable time-invariant characteristics of the departments' tasks or teams.²² Furthermore, we include period fixed effects to account for seasonality (for example, our site experiences predictable variations in production volume with peaks concentrated in specific months) and unobservable changes in the industry and macroeconomic conditions that may influence demand for the firm's products.

²² Recall that, during our sample period, the composition of each department exhibits minimal changes.

Our data is structured as a long (strongly balanced) panel, in that N (number of departments) is smaller than t (number of months). Including the lagged dependent variable among the predictors requires addressing the intertemporal correlation between performance at time $(t-1)$ and performance at time t . Untabulated panel unit-root tests for the variable *PerfScore* reject the null hypothesis that our panels include unit roots, suggesting that our dependent variable is stationary.²³ Additionally, because performance is likely correlated across departments, we need to also allow for cross-sectional correlation (i.e., spatial dependence). Accordingly, we estimate conservative standard errors in all our tests using a Newey-West down weighting procedure and allow for correlation within and across departments as in Driscoll and Kraay (1998).²⁴

In column (1) of Table 2, we estimate employees' performance response to receiving a reward (penalty) irrespective of its allocation process by including the indicator variable $Bonus_{i,(t-1)}$ ($Penalty_{i,(t-1)}$) equal to one if department i received a bonus (penalty) in the prior period, and zero otherwise. We find that employees respond positively to receiving a bonus and negatively to receiving a penalty.²⁵ In column (2) of Table 2, we report the estimation of Equation (1). Our results show that workers in departments rewarded (punished) subjectively exhibit more positive (negative) performance reactions relative to workers who had not experienced any reward or punishment (i.e., the control group). In contrast, performance responses by workers who received a bonus (penalty) while ranking first (last) – i.e., workers receiving formula-based

²³ We performed the Levin-Lin-Chu (2002) with and without trends and with and without demeaning. We also performed the Breitung (2000, 2005) specifications, with and without trends, with and without demeaning, and with and without accounting for cross-sectional correlation of the error term. Because both the Levin-Lin-Chu (2002) and the Breitung (2000, 2005) specifications assume that all panels need to have the same value of ρ , we also performed the test using the Im-Pesaran-Shin (2003) specification, which relaxes that assumption and allows each panel to have its own ρ . For this specification, we also test versions with and without trends, and with and without demeaning. Results consistently reject the null hypothesis that our panels contain unit roots and suggest that our data is stationary.

²⁴ Dynamic panels of larger size are typically analyzed using the Arellano and Bond (1991) method to avoid the Nickell (1981) bias. Given that the bias is eliminated at the rate of $1/T$, this approach is not necessary in our sample with $T = 25$ (Flannery and Hankins 2013). We estimate our equations using the Stata command `xtsc` (Hoechle 2007).

²⁵ We acknowledge that this finding contrasts with the positive incentive effects associated with penalties as documented in prior research (e.g., Van der Stede et al. 2020; Hossain and List 2012). We conjecture that this difference may be due to the different structure of the incentive system specifically the fact that our field setting adopts a tournament setting involving the use of subjectivity to assign rewards and penalties. Examining the influence of different incentive structures on the sign of the performance reaction to penalties is beyond the scope of this paper, and we encourage future research to explore this possible relation.

rewards (penalties) – did not differ significantly from workers who were not rewarded or punished at all. Wald tests reported at the bottom of the table indicate larger performance responses to subjective rewards (punishments) than to formula-based bonuses (penalties). Taken together, our results support Hypothesis 1.²⁶ That is, employees respond reciprocally to subjective rewards and punishments that materialize as deviations from employees’ formula-based expectations. These subjective adjustments give rise to ex-post incentive effects incremental to those stemming from receiving a bonus or penalty per se.

Our results are economically significant. Recall that a department that reaches all assigned targets scores 100 points. We find that, on average, subjectively rewarded departments improve their objective performance score in the following month by about 18.4 points relative to departments that did not experience any reward or punishment. In contrast, departments that are punished subjectively exhibit performance declines of about 13 points relative to the control group.

--- Insert Table 2 here ---

4.2. Test of H2: Valence of Subjective Outcomes

Our second hypothesis predicts that performance responses to subjective rewards and punishments are more pronounced for outcomes of greater valence. In Section 3.2, we identified four types of deviations from workers’ expectations due to subjective adjustments in our tournament setting. Our second hypothesis predicts a more positive incentive effect for *Subjective Bonus* than *Subjective Penalty Override* and a more negative incentive effect for *Subjective Penalty* than *Subjective Bonus Override*. To predict employees’ performance response to each type of reward or punishment, we estimate the following equation:

$$\begin{aligned}
 PerfScore_{i,t} = & \alpha + \beta_1 ObjBonus_{i,(t-1)} + \beta_2 ObjPenalty_{i,(t-1)} + \beta_3 SubBonus_{i,(t-1)} \\
 & + \beta_4 SubPenalty_{i,(t-1)} + \beta_5 SubPenaltyOverride_{i,(t-1)} \\
 & + \beta_6 SubBonusOverride_{i,(t-1)} + \beta_7 PerfScore_{i,(t-1)} + \sum_{k=1}^{11} \beta_k k.Rank_{i,(t-1)} \\
 & + Fixed\ Effects + \varepsilon
 \end{aligned} \tag{2}$$

²⁶ All our results are robust to the influence of outliers. Repeating all our tests winsorizing the dependent variables at the 1st and 99th, 5th and 95th, and 10th and 90th percentiles in each month, the results (untabulated) are consistent with those reported in this manuscript.

All variables are defined in Appendix 3. We continue to control for rank effects and include fixed effects as in equation (1). We continue to adopt the estimation approach used in Driscoll and Kraay (1998).

Table 3 reports our results. We find statistically significant employees' performance responses only in association with subjective allocations of monetary bonuses and penalties. In contrast, subjective overrides of formula-based rewards and penalties do not appear to trigger significant reactions. These results are consistent with theoretical predictions of expectancy theory, by which the valence of an outcome is associated with significant motivational effects (Vroom 1964) and support Hypothesis 2.²⁷

--- Insert Table 3 here ---

4.3. Incentive Effects of Subjective Reward and Punishment *Decisions*

In a tournament setting, discretionary overrides of objective rankings can include both the allocation of subjective bonuses (penalties) and the corresponding bonus (penalty) override. Managers may be interested in the combined performance effects associated with both sides of their decision to use discretion to allocate performance-related payoffs. Therefore, we define subjective reward (punishment) *decisions* as the combination of the discretionary allocation of a bonus (penalty) and the corresponding override of a formula-based bonus (penalty). Equation (2) allows us to use post-estimation tests to combine employee responses. Table 4 reports the point estimates of linear combinations of the coefficients corresponding to the components of each subjective *decision*. First, we examine the aggregate performance response to a subjective reward decision (i.e., $SubBonus_{i,(t-1)} + SubBonusOverride_{i,(t-1)}$). We find that the overall effect of a subjective reward decision is significantly positive. In contrast, subjective punishment decision (i.e., $SubPenalty_{i,(t-1)} + SubPenaltyOverride_{i,(t-1)}$) exhibit a significantly negative effect. These results reinforce our previous conclusion that managers are likely to benefit from subjective rewards but

²⁷ As mentioned in Section 3.1, in our settings, managers are not constrained in the number of rewards and penalties they can allocate in any individual month. We repeated the estimation and post-estimation tests on a sample restricted to those months in which there is only one reward and one penalty, thus ensuring the one-to-one relation between subjective reward (penalty) and subjective reward (penalty) override when managers use discretion. Our results remain consistent with those reported in Table 3.

should consider using discretionary penalty allocations only if they expect that subjective penalties have sufficiently strong positive ex-ante incentive effects.²⁸

Next, we compare the combined effect of subjective reward and punishment decisions with their closest alternative – namely formula-based bonuses and penalties. That is, we estimate linear combinations of coefficients from Equation (2) to examine whether the combined effect of $(SubBonus_{i,(t-1)} + SubBonusOverride_{i,(t-1)} - ObjBonus_{i,(t-1)})$ and $(SubPenalty_{i,(t-1)} + SubPenaltyOverride_{i,(t-1)} - ObjPenalty_{i,(t-1)})$ are significantly different from zero. We find that subjective reward decisions are associated with positive incremental performance responses compared to formula-based bonuses. In contrast, the performance effects of subjective punishment decisions and formula-based penalties are not statistically different. These results further support our inference about the incremental usefulness of subjective rewards as a performance incentive compared to formula-based ones. In contrast, subjective punishments exhibit similar ex-post incentive effects to their formula-based version.²⁹

--- Insert Table 4 here ---

5. Additional Analyses

In this section, we conduct a series of additional tests to examine potential alternative explanations for our findings and attempt to quantify the ex-ante incentive effects of subjective allocations of performance-related rewards and penalties.

5.1. Information Effect of Subjectivity

A concern about the interpretation of our results arises from the possibility that the performance responses to subjective rewards and punishments we document in our study might instead reflect the ability of subjective payoff allocation to *predict* future performance. That is, performance improvements (declines)

²⁸ In Section 5.3, we attempt to quantify the ex-ante incentive effects of subjectivity in the allocation of rewards and penalties and find them to be relatively weak in our setting.

²⁹ Our conclusion is informed by the higher frequency of instances where subjective penalties are accompanied by subjective penalty overrides (i.e., 21 out of 25 periods in our setting), compared to instances in which the subjective penalty is allocated in addition to formula-based penalties (i.e., 4 out of 25 periods).

associated with subjective adjustments could simply be performance realizations of unmeasurable actions enacted in the prior period.

Prior empirical research examining the relation between managerial discretion and subsequent performance presents an information-based explanation of subjectivity. These studies argue that subjective evaluations either correct for noisy performance metrics (Baker et al. 1994; Gibbs et al. 2004) or impound non-contractible elements of performance that are then reflected in objective performance metrics in subsequent periods (Hayes and Schaefer 2000; Ederhof 2010). In our setting, the information-based explanation constitutes an omitted correlated variable. That is, it is possible that changes in performance observed in the period after subjective allocations of rewards and penalties may not represent reciprocal reactions to deviations from expected payoffs but rather non-contractible activities that influence performance in the month following their subjective assessment. Ideally, we would like to observe the direct effect of subjectivity on objectively measured performance while controlling for employee effort on such other factors, but this represents a limitation of our data.

We rely on the institutional characteristics of our research setting illustrated in Section 3.1, and especially the stated purpose of subjective evaluations at our site. We conducted field interviews with site executives, who are the same managers responsible for making subjective override decisions. They provided us with detailed examples of their application of subjectivity in the allocation of rewards and punishments (Appendix 2). Executives stated that subjective rewards aimed to encourage activities beyond the employees' strict job responsibilities that contribute to a positive and collaborative culture that benefits performance and facilitates long-term sustainability. Management also stated that they rely on subjective punishments (i.e., subjective penalties or subjective bonus overrides) to discourage behaviors that may harm the company in the future or that are examples of uncooperative relationships between departments.

The type of activities that are evaluated subjectively and the low likelihood to observe a direct reflection of these activities in the objective performance metrics, which are predominantly volume-based, in the following month and in the department that enacted these activities, lead us to conclude that the information-based interpretation of subjectivity is not likely to explain the totality of our results.

5.2. Shifting Output Between Periods

Another concern could arise from the possibility that the changes in performance after receiving subjective rewards and punishment may constitute mechanical effects whereby employees opportunistically shift output between periods. For example, a department at risk of ranking at the bottom of the objective-performance rankings could attempt to salvage its performance for the month by neglecting routine maintenance on their machinery, thus producing enough to rank at least second from the bottom. Management could observe this tactic and decide to allocate a subjective penalty to the department. The following month, that department's performance could decline because of unusually large machine downtime caused by previous inadequate levels of routine maintenance. In this case, the decline in performance associated with the subjective penalty would not be due to the incentive effect of the unfavorable treatment.

The multidimensional nature of the objective performance management system constitutes the first line of defense against these strategic behaviors. As described in Section 3, each department is evaluated based on a set of performance metrics along four dimensions. To prevent strategic shifting of production output from one month to the other at the expense of regular maintenance, management can include corresponding metrics and targets in the department's scorecard and capture both the department's production output and compliance with maintenance protocols. The internal tradeoff between elements of objective performance evaluation renders strategic output shifting significantly less advantageous.

Additionally, we address this concern empirically in two ways. First, we test whether the treatment in period ($t-1$) is associated with unusual high/low performance in the prior period ($t-2$). Specifically, if departments can strategically shift performance between periods, we would likely observe that a subjective or objective bonus (penalty) in ($t-1$) is preceded by abnormally low (high) objective performance in ($t-2$). We recode the variables corresponding to all six cases of rewards and punishments to the values they assume two periods later. We then estimate equation (1) on this sample. This estimation is equivalent to

testing whether treatment in period $(t-1)$ predicts performance in period $(t-2)$.³⁰ Untabulated results show no evidence of abnormally low (high) objective performance in the period preceding the allocation of subjective rewards (punishments), consistent with departments *not* shifting effort strategically between periods.

Second, we leverage the similarity in incentive to shift output between periods for the recipient of the reward (penalty) and the department that ranks immediately below (above) the recipient of the reward (penalty) but does not receive the reward (penalty). We construct the indicator variable $RunnerUpBonus_{i,(t-1)}$ ($RunnerUpPenalty_{i,(t-1)}$) equal to one if department i ranks immediately below (above) the department receiving the bonus (penalty) in period $(t-1)$ and zero otherwise. We then estimate Equation (2) augmented with these additional variables and report the results in Table 5. We continue to find significant performance changes associated with subjective bonuses and penalties, consistent with our main results. However, the departments coded as runner-ups do not exhibit significant performance responses. This further limits the possibility that our results may capture mechanical relations between performance levels due to strategic output shifting between periods.

--- Insert Table 5 here ---

5.3. Ex-Ante Incentive Effects of Subjective Rewards and Punishments

A limitation of our setting is that we cannot observe and fully quantify the ex-ante incentive effects of subjective rewards and punishments. Thus, our appraisal of the incentive effects of subjectivity in performance-related payoffs is limited to workers' ex-post behavioral responses. In this section, we attempt to estimate the ex-ante incentive effect of managerial discretion by examining the behavior of departments that do not experience any subjective reward or punishment (i.e., non-treated departments). These departments receive signals about the instrumentality of objective performance from observing the subjective treatment of others. These signals could influence their effort allocations in subsequent periods. Specifically, belief revisions about the instrumentality associated with formula-based payoffs could drive

³⁰ We are grateful to the Associate Editor for suggesting the specification of this test.

effort away from objective performance and toward non-contractable behaviors and activities assessed subjectively. Therefore, performance changes observed after observing subjective treatments of other departments reflect an ex-ante incentive and not an ex-post behavioral effect.

To examine this relation, we restrict the sample to non-treated departments (i.e., departments that do not receive any monetary bonus (penalty) – either subjectively or objectively – and do not experience a subjective bonus (penalty) override). We then construct indicator variables identifying periods where subjectivity was applied (and, therefore, was observable to non-treated departments). Specifically, we construct indicator variables capturing the presence of any subjectivity (*SubjectivityObserved*), subjective bonuses (*SubBonusObserved*) or penalties (*SubPenObserved*), subjective overrides of bonuses (*SubBonusOverrideObserved*) or penalties (*SubPenOverrideObserved*). We estimate the following model:

$$PerfScore_{i,t} = \alpha + \beta_1 Observed_{i,(t-1)} + \beta_2 PerfScore_{i,(t-1)} + \sum_{k=1}^{11} \beta_k k.Rank_{i,(t-1)} + Fixed\ Effects + \varepsilon \quad (3)$$

where we substitute the variable *Observed* with each of the five indicator variables described above. We do not include period fixed effects because the newly created variables are period-specific. Estimation results are reported in Table 6 and indicate no significant performance changes when non-treated departments observe subjective treatments of others. These results suggest that ex-ante incentive effects of subjective rewards and punishments are relatively weak in our setting or are already embedded in the workers' effort allocation choices and are not subject to significant further belief revision.

--- Insert Table 6 here ---

For robustness, we isolate from the group of non-treated departments those that, due to their particular rankings, could be more likely to revise their beliefs upon receiving signals about the instrumentality of objective performance metrics. First, we consider departments that ranked above (below) a department receiving a subjective bonus (penalty) but did not receive any bonus (penalty). Scoring better (worse) objective performance scores than the recipients of subjective bonuses (penalties) while not ranking first (last) could contribute to belief revisions about the relative importance of objective versus subjective performance dimensions, thus impacting the instrumentality link for these workers. We identify these

departments with indicator variables *SubBonusOverrideExpanded* and *SubPenaltyOverrideExpanded*, respectively. We also isolate departments previously identified with the variables *RunnerUpBonus_{i,(t-1)}* and *RunnerUpPenalty_{i,(t-1)}*. These departments could experience different ex-ante incentive effects arising from the observation of subjective treatment of others due to their vicinity to receiving an actual reward or penalty. Untabulated tests continue to show no evidence of a significant performance effect among these selected non-treated departments. Collectively, these results suggest that the ex-ante incentive effects of subjective rewards and punishment in our setting are relatively weak. Thus, in our setting, managers appear to benefit from subjective rewards but not necessarily from subjective penalties.³¹

7. Conclusions

This study explores the incentive effects of managerial discretion in allocating monetary rewards and penalties. Prior research shows that employees prefer bonus-framed contracts over penalty-framed ones but work harder if faced with the prospect of a penalty compared to a reward. Nonetheless, the ex-post incentive effects of experiencing a reward or penalty have received scant attention. A recent study by Van der Stede et al. (2020) documents employees' performance responses to formula-based rewards and penalties. Our study shows that subjective allocations of rewards and punishments give rise to incremental ex-post incentive effects.

We study this phenomenon in a setting with tournament-based incentives where the allocation of financial bonuses and penalties depends on a combination of objective metrics and subjective performance evaluations. A valuable characteristic of our research site is that employees can observe the application of managerial discretion and compare the ultimate payoff allocations with rankings based uniquely on objective performance measures. Consistent with theory, we posit that employees rely on objective performance metrics to form payoff expectations. Motivated by expectancy theory, we predict that subjective adjustments resulting in favorable (unfavorable) deviations from payoff expectations are associated with objective performance improvements (declines) relative to employees that do not

³¹ We reach this conclusion in light of observing weak ex-ante incentive effects of subjectivity and the higher frequency of cases where subjective penalties are coupled with subjective penalty overrides (see footnote 28).

experience any reward or punishment. These performance responses are incremental to those observed among employees who receive formula-based bonuses and penalties. Additionally, we find that these effects are more pronounced for subjective outcomes with greater valence (i.e., subjective decisions resulting in actual monetary amounts, as opposed to decisions leading to missing out on a bonus or being saved from a penalty). Collectively, our findings suggest that managers can benefit from subjective reward decisions but should avoid subjective punishments, unless they expect ex-ante incentive effects from the prospect of subjective penalties large enough to counterbalance the detrimental ex-post performance responses. While we cannot rigorously quantify ex-ante incentive effects in our research setting, our exploratory analyses indicate that these effects are relatively weak. We recommend that managers evaluate these ex-ante effects within the context of their operations.

While our research site exhibits several characteristics that make it ideal for exploring our phenomenon of interest, our work is subject to limitations common to field-based research. In particular, since our study is based on a single Chinese manufacturing organization, the generalizability of our results to other industries and cultures may be limited. Additionally, the generalizability of our findings depends on workers having sufficient information on their objective performance to detect the application of discretionary adjustments to compensation outcomes. However, we note that most companies disseminate objective performance information via scorecards and KPI dashboards within the organization. Additionally, many firms allow managers to include subjective evaluations in the assessments of their subordinates and disclose the identity of recipients of rewards and penalties within the organization (e.g., engraved plaques, “employee-of-the-month” posters, etc.). Our specific advantage in this study arises from the possibility to detect and empirically measure the application of managerial discretion in our field setting. Finally, difficulties in capturing workers’ perceptions of the incentive system at our research site preclude us from examining additional cross-sectional variations and contextual factors that could provide further insights into finer behavioral mechanisms underlying workers’ performance responses to managerial discretion.

Despite these limitations, our study contributes to the literature on subjectivity in incentive contracting by providing empirical evidence of incentive effects associated with managerial discretion in the allocation of performance-related payoffs. Our results provide important insights for the practitioner community by highlighting broad implications of subjective performance evaluations that may significantly affect the effectiveness of an incentive system.

Appendix 1: Example of *PerfScore* Calculation

Performance Measure	Weight	Actual/Target
Financial Score	40%	100%
Non-financial Score	40%	87.5%
Innovation Score	15%	20%
Compliance Score	5%	40%
Performance Score = $100 \times 40\% + 87.5 \times 40\% + 20 \times 15\% + 40 \times 5\% = 40 + 35 + 3 + 2 = 80$		

Notes: This table presents an example of the calculation of a department's monthly performance score (*PerfScore*) in our research site. The objective portion of the department's performance measurement is based on the assessment of actual performance against targets set for four dimensions. The financial dimension includes measures such as quantity of production output, cost savings, etc. The non-financial performance dimension includes measures of quality (e.g., customer complaints, failure rates, internal complaints, etc.). The innovation dimension relates to quantifiable process or product improvements. The compliance dimension measures workers' abidance to the company's code of conduct and firm policies.

Appendix 2: Examples of Subjective Adjustments to Formula-based Rewards and Punishments based on Interviews with Management

Example of receiving a bonus without ranking first (i.e., Subjective Bonus):

“The Purchasing Department’s performance ranked second. However, the management decided to assign the reward to this department for its exemplary behaviors that benefited all other departments by setting a standard to organize workflows. The Purchasing Department clearly marked the number and dimensions of its purchased machines and raw materials on their boxes. This organization had a positive influence in planning for the subsequent transportation of the boxes. For example, it allowed for easier budgeting of the required number of transportation vehicles and drivers. This resulted in increased efficiency and reductions in overhead transportation costs. For example, in the most recent plan, transportation was arranged for in two medium-sized trucks by two drivers. However, the careful labeling introduced by the Purchasing Department allowed for switching to one large truck which also minimized safety concerns in the transportation process. The subjective adjustment served the purpose of rewarding the Purchasing Department for its proactive engagement in behaviors that are not required, but had a positive spillover effects to other departments and the company.”

Example of receiving a penalty without ranking last (i.e., Subjective Penalty):

“The performance of the Purchasing Department ranked fourth to last, but they failed to be responsive to the alerts by other departments. For example, other departments were concerned about limited warehouse capacity at the beginning of the month that could impact their workflow. Thus, several requests were made to the Purchasing Department to provide other departments with timely updates on the Purchasing Department’s stock order and delivery dates. However, the Purchasing Department was unresponsive to these requests as they did not expect any exceptional circumstances due to their order schedules. The management decided to assign the penalty to the Purchasing Department because unresponsiveness should be strongly discouraged which could severely impact within-organizational communication.”

Example of not receiving a penalty despite ranking last (i.e., Subjective Penalty Override):

“The performance of the Box-gluing Department ranked last, but other departments reported that the Box-gluing Department actively and transparently shared regular updates and gave them reasonable expectations about their workflows. When the progress may be lower than expected, they also promptly explained to other departments. Other departments believe that such inter-departmental communication is very important, which allows other departments to make better budgeting decisions, ultimately resulting in greater inter-departmental trust, and improvement in company morale. The management decided not to impose penalties to the Box-gluing Department to reward such behaviors that are conducive to enhancing the company's culture.”

Example of not receiving a bonus despite ranking first (i.e., Subjective Bonus Override):

“The performance of the Business Department ranked first. However, in order to improve sales performance, some salespersons over-promised the delivery cycle to potential customers without informing the management. This resulted in insufficient manpower to execute the orders which resulted in a negative impact on the company’s overall reputation and employee morale in other departments. The management decided not to award the reward to the Business Department in order to discourage such behaviors.”

Appendix 3: Variables Definitions

Variable	Description
<i>PerfScore</i>	Total performance score
<i>Bonus</i>	Indicator variable equal to one if a department receives a monetary bonus, and zero otherwise
<i>Penalty</i>	Indicator variable equal to one if a department is assigned a monetary penalty, and zero otherwise
<i>ObjBonus</i>	Indicator variable equal to one if a department ranked first receives a monetary bonus, and zero otherwise
<i>ObjPenalty</i>	Indicator variable equal to one if a department ranked last receives a monetary penalty, and zero otherwise
<i>SubReward</i>	Indicator variable equal to one if a department experiences a favorable deviation from their payoff expectations due to subjective overrides (i.e., either <i>SubBonus</i> or <i>SubPenaltyOverride</i>), and zero otherwise.
<i>SubPunishment</i>	Indicator variable equal to one if a department experiences an unfavorable deviation from their payoff expectations due to subjective overrides (i.e., either <i>SubPenalty</i> or <i>SubBonusOverride</i>), and zero otherwise
<i>SubBonus</i>	Indicator variable equal to one if a department receives a monetary bonus without attaining the highest performance score, and zero otherwise
<i>SubjPenalty</i>	Indicator variable equal to one if a department if the department is assigned a monetary penalty without attaining the lowest performance score, and zero otherwise
<i>SubPenaltyOverride</i>	Indicator variable equal to one if a department is not assigned a monetary penalty despite ranking last based on the performance score, and zero otherwise
<i>SubBonusOverride</i>	Indicator variable equal to one if a department does not receive a monetary bonus despite ranking first based on the performance score, and zero otherwise
<i>RunnerUpBonus</i>	Indicator variable equal to one if department ranks immediately below the department receiving the bonus, and zero otherwise.
<i>RunnerUpPenalty</i>	Indicator variable equal to one if department ranks immediately above the department receiving the penalty, and zero otherwise.
<i>SubPenaltyOverrideExpanded</i>	Indicator variable equal to one if a department is not assigned a monetary penalty did not rank last, and the penalty was assigned to a department that ranked higher. Zero otherwise.
<i>SubBonusOverrideExpanded</i>	Indicator variable equal to one if a department is not assigned a monetary bonus, did not rank first, and the reward was assigned to a department that ranked lower. Zero otherwise.
<i>SubjectivityObserved</i>	Indicator variable equal to one if management applied subjectivity belonging to any of the four types in the period, and zero otherwise.
<i>SubBonusObserved</i>	Indicator variable equal to one if there was a subjective bonus assigned by management in the period, and zero otherwise.
<i>SubPenaltyObserved</i>	Indicator variable equal to one if there was a subjective penalty assigned by management in the period, and zero otherwise.
<i>SubBonusOverrideObserved</i>	Indicator variable equal to one if there was a subjective bonus override assigned by management in the period, and zero otherwise.

<i>SubPenaltyOverrideObserved</i>	Indicator variable equal to one if there was a subjective penalty override assigned by management in the period, and zero otherwise.
<i>k.Rank</i>	Indicator variable equal to 1 for the k^{th} rank in a given period (where k is an integer defined between 1 and 11), and zero otherwise.

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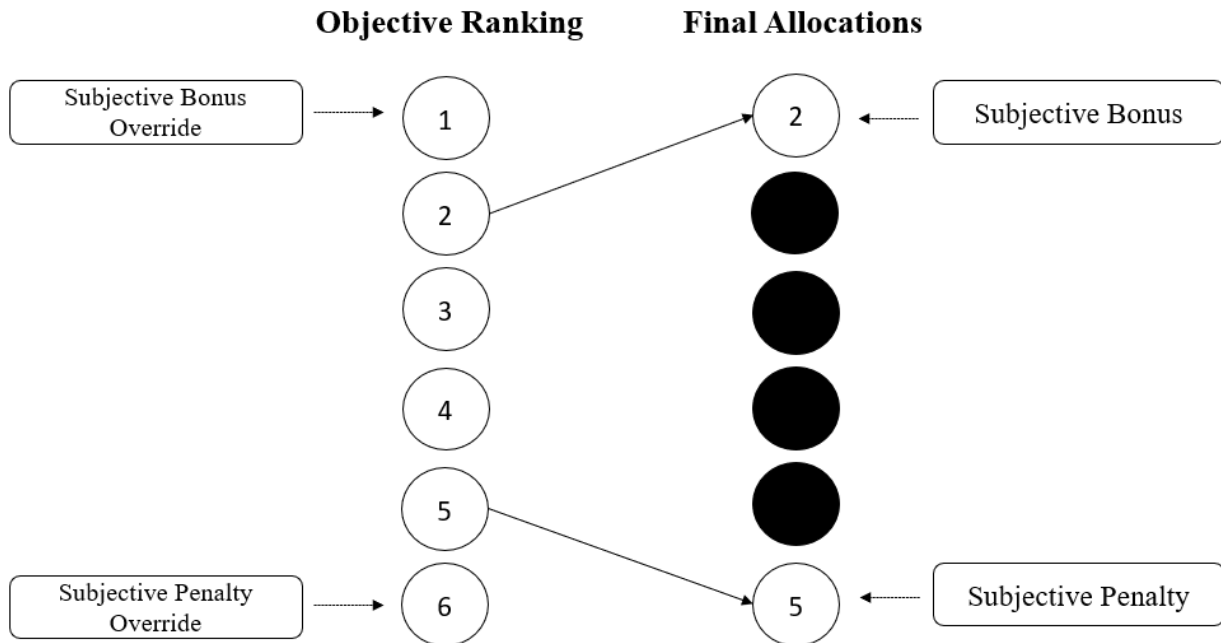
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Figure 1: Definitions

Panel A: Operationalization of Constructs

	Cases	Description
Subjective Reward	Subjective Bonus	The department receives a bonus without ranking first
	Subjective Penalty Override	The department does not receive a penalty despite ranking last
Subjective Punishment	Subjective Penalty	The department receives a penalty without ranking last
	Subjective Bonus Override	The department does not receive a bonus despite ranking first

Panel B: Graphical Representation



Notes: Panel A illustrates the definitions of the different types of subjective rewards and punishments. Panel B represents a hypothetical sample of 6 departments that illustrates the four types of subjective overrides of objective rankings in our research setting. In this example, we assume that managers use subjective adjustments to assign the bonus (penalty) to Department 2 (5).

Table 1: Descriptive Statistics

Panel A: Department/Period level

Variable	N	Mean	Std. dev.	Min	p25	p50	p75	Max
<i>PerfScore</i>	275	63.479	17.001	23	52	65	75	107
<i>Bonus</i>	275	0.087	0.283	0	0	0	0	1
<i>Penalty</i>	275	0.109	0.312	0	0	0	0	1
<i>ObjBonus</i>	275	0.044	0.205	0	0	0	0	1
<i>ObjPenalty</i>	275	0.062	0.241	0	0	0	0	1
<i>SubReward</i>	275	0.073	0.260	0	0	0	0	1
<i>SubPunishment</i>	275	0.095	0.293	0	0	0	0	1
<i>SubBonus</i>	275	0.044	0.205	0	0	0	0	1
<i>SubPenalty</i>	275	0.047	0.213	0	0	0	0	1
<i>SubPenaltyOverride</i>	275	0.029	0.168	0	0	0	0	1
<i>SubBonusOverride</i>	275	0.047	0.213	0	0	0	0	1

Panel B: Number of Rewards, Penalties, and Subjective Treatment in the Sample Period at the Department level

Variable	N	Mean	Std. dev.	Min	p25	p50	p75	Max
<i>Bonus</i>	11	2.182	2.272	0	0	2	3	8
<i>Penalty</i>	11	2.727	2.649	0	1	2	5	9
<i>ObjBonus</i>	11	1.091	1.814	0	0	0	2	6
<i>ObjPenalty</i>	11	1.545	2.296	0	0	0	4	6
<i>SubReward</i>	11	1.818	1.250	0	1	1	3	4
<i>SubPunishment</i>	11	2.364	0.924	1	2	2	3	4
<i>SubBonus</i>	11	1.091	0.944	0	0	1	2	3
<i>SubPenalty</i>	11	1.182	0.982	0	0	1	2	3
<i>SubPenaltyOverride</i>	11	0.727	1.009	0	0	0	1	3
<i>SubBonusOverride</i>	11	1.182	0.982	0	0	1	2	3

Notes: This table reports the summary statistics for all variables of interest in our analyses. Panel A reports statistics based on monthly data for 25 months for all 11 departments. Panel B reports statistics, only limited to the number of rewards and punishment variables, at the department level. All variable definitions are provided in Appendix 3.

Table 2: Test of H1: Subjective vs. Objective Rewards and Punishments

		(1)	(2)
		<i>PerfScore</i> _{<i>i,t</i>}	<i>PerfScore</i> _{<i>i,t</i>}
<i>Bonus</i> _{<i>i,(t-1)</i>}	b ₁	14.000*** (3.190)	
<i>Penalty</i> _{<i>i,(t-1)</i>}	b ₂	-15.311*** (1.874)	
<i>ObjBonus</i> _{<i>i,(t-1)</i>}	b ₃		-4.873 (5.936)
<i>ObjPenalty</i> _{<i>i,(t-1)</i>}	b ₄		-0.516 (4.133)
<i>SubReward</i> _{<i>i,(t-1)</i>}	b ₅		18.410*** (2.331)
<i>SubPunishment</i> _{<i>i,(t-1)</i>}	b ₆		-13.041*** (2.042)
<i>PerfScore</i> _{<i>i,(t-1)</i>}	b ₇	0.281*** (0.091)	0.783*** (0.097)
<i>k.Rank</i> _{<i>i,(t-1)</i>} Indicators		Yes	Yes
Department FE		Yes	Yes
Period FE		Yes	Yes
N		264	264
Within R ²		0.506	0.510
Wald Tests (F-statistic)			
<i>SubReward</i> _{<i>i,(t-1)</i>} > <i>ObjBonus</i> _{<i>i,(t-1)</i>}	b ₅ > b ₃		11.03***
<i>SubPunishment</i> _{<i>i,(t-1)</i>} > <i>ObjPenalty</i> _{<i>i,(t-1)</i>}	b ₆ < b ₄		8.14***

Notes: In column 1 we report the estimation of a model predicting the effect of receiving a bonus or penalty (independently from the subjective or formula-based allocation process) on subsequent objective performance. Column 2 reports the coefficients estimated for equation (1). In all our estimations we calculate conservative standard errors using a Newey-West down weighting procedure as in Driscoll and Kraay (1998) to allow for cross-sectional and serial correlation and fixed effects. For each coefficient, we report standard errors in parentheses. All variables' definitions are summarized in Appendix 3. The models control for the performance effects of prior period rank and include department and period fixed effects. Statistical significance of post-estimation comparisons of coefficients' magnitudes using Wald tests is reported at the bottom of the table. Two-tail statistical significance is indicated by: * = (p<0.10), ** = (p<0.05), *** = (p<0.01).

Table 3: Test of H2: Valence of Subjective Outcomes

		<i>PerfScore</i> _{<i>i,t</i>}
<i>ObjBonus</i> _{<i>i,(t-1)</i>}	b ₁	4.508 (5.221)
<i>ObjPenalty</i> _{<i>i,(t-1)</i>}	b ₂	-8.987 (7.008)
<i>SubBonus</i> _{<i>i,(t-1)</i>}	b ₃	21.716*** (4.285)
<i>SubPenalty</i> _{<i>i,(t-1)</i>}	b ₄	-18.423*** (2.179)
<i>SubBonusOverride</i> _{<i>i,(t-1)</i>}	b ₅	2.555 (5.852)
<i>SubPenaltyOverride</i> _{<i>i,(t-1)</i>}	b ₆	3.877 (7.957)
<i>PerfScore</i> _{<i>i,(t-1)</i>}	b ₇	0.413** (0.181)
<i>k.Rank</i> _{<i>i,(t-1)</i>} Indicators		Yes
Department FE		Yes
Period FE		Yes
N		264
Within R ²		0.533

Notes: This table reports the coefficients estimated for equation (2). In all our estimations we calculate conservative standard errors using a Newey-West down weighting procedure as in Driscoll and Kraay (1998) to allow for cross-sectional and serial correlation and fixed effects. For each coefficient, we report standard errors in parentheses. All variables' definitions are summarized in Appendix 3. The model controls for the performance effects of prior period rank and includes department fixed effects and period fixed effects. Two-tail statistical significance is indicated by: * = (p<0.10), ** = (p<0.05), *** = (p<0.01).

Table 4: Effects of Subjective Reward and Punishment Decisions

Linear Combination Tests (Point Estimates)		
Aggregate Effects of Subjective Allocation Decisions		
$SubBonus_{i,(t-1)} + SubBonusOverride_{i,(t-1)}$	$b_3 + b_5$	24.27**
$SubPenalty_{i,(t-1)} + SubPenaltyOverride_{i,(t-1)}$	$b_4 + b_6$	-14.55*
Comparing Subjective Allocation Decisions with Objective Allocations		
$SubBonus_{i,(t-1)} + SubBonusOverride_{i,(t-1)} - ObjBonus_{i,(t-1)}$	$b_3 + b_5 - b_1$	19.76*
$SubPenalty_{i,(t-1)} + SubPenaltyOverride_{i,(t-1)} - ObjPenalty_{i,(t-1)}$	$b_4 + b_6 - b_2$	-5.56

Notes: This table reports the results of post-estimation tests for equation (2). The first two rows report estimates of linear combinations of coefficients reported in Table 3 to capture the aggregate performance response to subjective reward (punishment) *decisions*. The bottom two rows report estimates that compare the subjective reward (punishment) decisions with their formula-based equivalent (i.e., formula-based bonus or penalty). Two-tail statistical significance is indicated by: * = (p<0.10), ** = (p<0.05), *** = (p<0.01).

Table 5: Incentive to Shift Output Between Periods

	(1)	(2)	(3)
	<i>PerfScore</i> _{<i>i,t</i>}	<i>PerfScore</i> _{<i>i,t</i>}	<i>PerfScore</i> _{<i>i,t</i>}
<i>RunnerUpBonus</i> _{<i>i,(t-1)</i>}	-1.347 (2.280)	-1.297 (2.134)	-0.679 (2.066)
<i>RunnerUpPenalty</i> _{<i>i,(t-1)</i>}	-2.858 (3.378)	-2.688 (3.748)	-3.303 (3.346)
<i>Bonus</i> _{<i>i,(t-1)</i>}	13.659*** (3.510)		
<i>Penalty</i> _{<i>i,(t-1)</i>}	-15.901*** (1.801)		
<i>ObjBonus</i> _{<i>i,(t-1)</i>}		-5.478 (5.922)	4.101 (5.236)
<i>ObjPenalty</i> _{<i>i,(t-1)</i>}		-0.790 (4.230)	-9.201 (7.060)
<i>SubReward</i> _{<i>i,(t-1)</i>}		18.094*** (2.637)	
<i>SubPunishment</i> _{<i>i,(t-1)</i>}		-13.724*** (2.067)	
<i>SubBonus</i> _{<i>i,(t-1)</i>}			21.433*** (4.708)
<i>SubPenalty</i> _{<i>i,(t-1)</i>}			-19.408*** (2.006)
<i>SubBonusOverride</i> _{<i>i,(t-1)</i>}			2.174 (6.043)
<i>SubPenaltyOverride</i> _{<i>i,(t-1)</i>}			3.770 (8.146)
<i>PerfScore</i> _{<i>i,(t-1)</i>}	0.277*** (0.096)	0.787*** (0.097)	0.414** (0.188)
<i>k.Rank</i> _{<i>i,(t-1)</i>} Indicators	Yes	Yes	Yes
Department FE	Yes	Yes	Yes
Period FE	Yes	Yes	Yes
N	264	264	264
Within R ²	0.508	0.513	0.536

Notes: This table reports the results of our tests analyzing departments ranking immediately below (above) the recipients of bonuses (penalties). The results reported in columns 1 and 2 relate to our tests reported in Table 2. The results reported in column 3 relate to the tests reported in Table 3. In all our estimations we calculate conservative standard errors using a Newey-West down weighting procedure as in Driscoll and Kraay (1998) to allow for cross-sectional and serial correlation and fixed effects. For each coefficient, we report standard errors in parentheses. All variables' definitions are summarized in Appendix 3. The model controls for the performance effects of prior period rank and includes department and period fixed effects. Two-tail statistical significance is indicated by: * = (p<0.10), ** = (p<0.05), *** = (p<0.01).

Table 6: Ex-Ante Incentive Effects of Subjectivity on Non-Treated Departments

	(1)	(2)	(3)	(4)	(5)
	<i>PerfScore</i> _{<i>i,t</i>}	<i>PerfScore</i> _{<i>i,t</i>}	<i>PerfScore</i> _{<i>i,t</i>}	<i>PerfScore</i> _{<i>i,t</i>}	<i>PerfScore</i> _{<i>i,t</i>}
<i>SubjectivityObserved</i> _{<i>i,(t-1)</i>}	0.867 (2.362)				
<i>SubBonusObserved</i> _{<i>i,(t-1)</i>}		1.084 (2.291)			
<i>SubPenaltyObserved</i> _{<i>i,(t-1)</i>}			0.122 (1.967)		
<i>SubBonusOverrideObserved</i> _{<i>i,(t-1)</i>}				-0.893 (2.596)	
<i>SubPenaltyOverrideObserved</i> _{<i>i,(t-1)</i>}					-1.605 (1.871)
<i>PerfScore</i> _{<i>i,(t-1)</i>}	0.545*** (0.125)	0.553*** (0.111)	0.538*** (0.134)	0.521*** (0.135)	0.553*** (0.128)
<i>k.Rank</i> _{<i>i,(t-1)</i>} Indicators	YES	YES	YES	YES	YES
Department FE	YES	YES	YES	YES	YES
Period FE	NO	NO	NO	NO	NO
N	191	191	191	191	191
Within R ²	0.155	0.157	0.155	0.156	0.158

Notes: This table reports the results of our analyses of the performance responses of non-treated departments (i.e., departments that did not experience subjective treatments and did not receive a bonus or penalty) to observing subjective treatment of others. All variables are defined in Appendix 3. In all our estimations we calculate conservative standard errors using a Newey-West down weighting procedure as in Driscoll and Kraay (1998) to allow for cross-sectional and serial correlation and fixed effects. For each coefficient, we report standard errors in parentheses. All variables' definitions are summarized in Appendix 3. We control for the performance effects of prior period rank. We do not include period fixed effects, as the variables constructed to identify the presence of subjective treatments in month (t-1) are period-specific. We include department fixed effects. Two-tail statistical significance is indicated by: * = (p<0.10), ** = (p<0.05), *** = (p<0.01).