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Disclosure of Contract Clauses and Career Concerns

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Abstract

In this study, we analyze a simple moral hazard model in which a risk-neutral agent has career concerns and is protected by limited liability. The agent cares about both career concerns and explicit incentives given by the principal. We consider the following two cases: (i) when the explicit contract is unobservable for the labor market, and (ii) when the principal discloses contract. If the explicit compensation contract is unobservable, the labor market needs to update its belief regarding the agent type on the basis of the realized outcome and the inference of the agent's effort choice. However, if the principal discloses contract clauses, the labor market knows how much effort is planned to be induced. The principal, then, can influence the market's belief through the observable contract. By disclosing contract clauses, the principal can induce a higher level of effort from the agent because she can control career concern incentives directly as well as monetary incentives.

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1 Introduction

Managerial compensation contracts are not a private matter since the public disclosure of executive pay is required by the Securities and Exchange Commission. Moreover, authority over compensation decisions rests not with shareholders but rather with compensation committees composed of outside members of the boards of directors. Compensation disclosures typically improve accountability of payments and mitigate managers' rent extraction (Bebchuk *et al.*, 2002); however, there can be several side-effects as a result. Disclosures from other firms might provide new information, and the managers may use higher-paid peers to justify additional rent extraction (Faulkender and Yang, 2010). Firms may distort executives' compensations upwardly to affect market perceptions of firm value (Hayes and Schaefer, 2009). Disclosure changes firms' hiring and wage-setting policies and employees' bargaining strategies (Cullen and Pakzad-Hurson, 2019)

In this paper, we rather focus on the effect of compensation contracts' observability on the agents' career concern incentives. In particular, we argue that contract disclosure allows to directly affect the agent's reputation. We consider a simple moral hazard model in which a risk-neutral agent has career concerns and is protected by limited liability. The agent cares about both the compensations paid by the principal and his reputation gain evaluated in the labor market. Then, compensation contract details unveil the principal's requirements and expectations on the agent's behavior. In such an environment, by disclosing contract clauses, the principal can induce a higher level of effort from the agent because she can control career concern incentives directly as well as monetary incentives.

In the career concerns model without explicit incentive contracts, it is typically assumed that the labor market updates its beliefs regarding the agent type on the basis of the realized outcome and the inference of the agent's behavior. The same holds when the principal can write an explicit contract, as long as it is unobservable. (Here the labor market cannot infer the agent's effort choice from the contract.) If the principal discloses the contract's clauses, however, the labor market will know the level of effort that will be induced by the contract. In this case, the principal can manipulate the market's belief through the observable contract. In fact, if the principal can inform the labor market that she plans to implement a larger level of effort, the agent has a grater career concern incentive to make effort. The principal can implement a higher level of effort by raising the effort level inferred by the labor market.

This article belongs to a growing literature on the agent's career concerns. See, e.g., Hölmström (1999) and Dewatripont *et al* (1999). In particular, Gibbons and Murphy (1992) for optimal financial incentives, Meyer and Vickers (1997) for relative performance evaluation, and Tamada and Tsai (2014) for delegation policy in the sequential project problem analyze the interactions between explicit incentives governed by contracts and implicit incentives governed by career concerns.

We study that contract disclosure allows the principal to affect the agent's reputation. As is the case in our analysis, Bar-Isaac (2007), Mukherjee (2008), and Kim (2017) consider the principal's action to manipulate the agent's reputation. Bar-Isaac considers a team such as a law firm or a consulting firm, which consists of a senior agent and a junior agent. While the junior works for his own reputation, the senior, whose reputation is already established, exerts effort on team production to improve the junior's reputation, which in turn increases the value of the team. Kim considers a situation in which the agent's career concern leads to inertia, that is, a tendency to resist initiating new projects and to choose existing status-quo projects. He, then, shows that the principal can manipulate the market's perception of the agent's ability by extending monitoring and reducing intervention, which damages the agent's reputation when choosing status-quo. The principal can induce the agent to take up new projects. Mukherjee considers a model where two principals sequentially contract with a common agent, where the first principal can disclose information about outcomes.[*] Then, he argues that information disclosure enhances the agent's career concern incentive and matching quality, but exposes the agent to additional risk.[†] This note also studies the principal's strategy to manipulate the market's belief formation. We focus on the simple compensation contract, which is the most basic model to describe the moral hazard problem, and make it clear that the principal can influence the agent's career concern incentives just by disclosing it.

The role of observability has been investigated in different environments. Hörner and Vieille (2009) and Kaya and Liu (2015) consider a sequential bargaining between a single long-run party and a sequence of short-run parties. and identify the effects of the observability of past price sequences on the bargaining outcome. In particular, Kaya and Liu show that the price transparency leads to lower prices and longer expected delay. Bergemann and Hörner (2010) study the role of transparency on auction outcomes.

The article proceeds as follows. Section 2 introduces the model. In Section 3 and 4, unobservable and observable contracts, respectively, are analyzed. Section 5 concludes.

[*] Calzolari and Pavan (2006) also examine the information disclosure problem in a common agency environment.

[†] Wolitzky (2012) also considers the career concerns model and analyzes the manipulation of information thorough the unobservable contract between the principal and the agent. Tamada and Tsai (2018) study the effect of the observability of allocation of authority on a principal's delegation policy when she cares about her reputation.

2 The Model

There are three parties in the model: a principal (she), an agent (he), and the labor market. The agent cares both about wage payments from the principal and the labor market's perception of his ability, which affects his future career.

The principal has a project to run, where the outcome of the project Y is either success ($Y = S$) or failure ($Y = F$, $S > F$). The probability of success depends upon both the agent's effort $\alpha \in [0, 1]$ and his ability $\tilde{\mu} \in [0, 1]$. Specifically, the outcome is either S, with a probability of $\tilde{\mu}\alpha$, or F, with a complementary probability of $1 - \tilde{\mu}\alpha$.

The agent chooses an effort level α at a disutility of $D(\alpha) \geq 0$. We assume that $D(\alpha)$ is twice continuously differentiable, $D'(\alpha) > 0$, and $D''(\alpha) > 0$, with $D(0) = D'(0) = 0$ and $\lim_{\alpha \to 1} D(\alpha) = \infty$.

The agent's effort α is unobservable to the principal and the labor market. The outcome $Y \in \{S, F\}$ is observable to all parties, and the principal can write a wage contract (w_S, w_F) that depends upon the realized outcome. We assume that the agent is protected by limited liability, thus, $w_Y \geq 0$.

Information regarding the agent's type is assumed to be symmetric among all the players, and none of them can observe the agent's type ex ante. It is a stochastic variable characterized by a continuous probability density function $f(\tilde{\mu})$, an expected value μ, and a variance σ. The expected value μ, which represents a common prior belief regarding the agent's ability, represents his *ex ante* reputation.

The principal and the agent are risk-neutral. The principal's payoff is given by $Y - w_Y$, where we normalize $F = 0$. In addition to the wage payment, the agent also cares about his career in the labor market. Let $\hat{\mu}_Y$ be the posterior belief regarding the manager's type when the outcome is $Y \in \{S, F\}$, which the (labor) market evaluates. This can then be interpreted as the agent's *ex post* reputation. When the outcome is Y, the agent's payoff is $w_Y + \gamma\hat{\mu}_Y - D(\alpha)$, where $\gamma > 0$ represents the relative importance of career concerns.[‡]

In this article, we analyze the principal's optimal wage contract. Two cases will be discussed separately. In Section 3, we assume that the labor market cannot observe wage contract clauses, and so he needs to form a belief regarding the level of effort that the principal tries to induce through the contract. In Section 4, we consider the case that the labor market can observe the wage contract clauses, and so the market can measure the level of effort the principal plans to elicit.

[‡]A parameter γ may reflect his discount rate; that is his preference for current income relative to future rewards.

3 The Unobservable Contract

We first consider the case in which the labor market cannot observe contract clauses. Since the agent's effort choice is unobservable, he cannot affect the market's belief directly. Moreover, since the wage contract is also unobservable, the principal cannot directly convey information regarding the effort level, which the principal plans to induce through the contract, to the labor market.

In equilibrium, the labor market's belief must be consistent with the agent's effort choice. The equilibrium path satisfies the following three requirements:

1. The principal writes a contract (w_S, w_F) to implement α^* given the market's belief $\tilde{\alpha}$ about the agent's effort. (The market forms *ex post* belief regarding the agent's type by using $\tilde{\alpha}$.)

2. The agent chooses an effort level, given the contract and the market belief $\tilde{\alpha}$.

3. $\tilde{\alpha}$ coincides with α^*.[§]

Suppose that the labor market believes that the agent exerts the effort level $\tilde{\alpha}$. Then, the agent's *ex post* reputations are described by the following lemma:

Lemma 1. *Suppose that the labor market believes that the agent exerts a certain effort level $\tilde{\alpha}$. Then the market's ex post evaluation of the agent's ability is given by the following:*

$$\hat{\mu}_S(\tilde{\alpha}) = \mu + \frac{\tilde{\alpha}\sigma}{\mu\tilde{\alpha}} = \mu + \frac{\sigma}{\mu} \tag{1}$$

when the final outcome is S, which does not depend upon $\tilde{\alpha}$, and

$$\hat{\mu}_F(\tilde{\alpha}) = \mu - \frac{\tilde{\alpha}\sigma}{1 - \mu\tilde{\alpha}} \tag{2}$$

when the final outcome is F.

Proof. See the Appendix.

Clearly, the inequalities $\hat{\mu}_S(\tilde{\alpha}) \geq \mu \geq \hat{\mu}_F(\tilde{\alpha})$ are always satisfied. As for the expected value of the agent's *ex post* reputation, a martingale property of belief formation ensures that an expected value of *ex post* belief is always equal to μ.

[§]That is, the belief is "self-fulfilling" on the equilibrium. This has been seen in the career concerns literature. See, e.g., Gibbons and Murphy (1992) or Dewatripont *et al.* (1999).

Given the contract (w_S, w_F) and the market's belief $\tilde{\alpha}$, the agent's expected utility when choosing α becomes

$$EU(w_S, w_F, \alpha; \tilde{\alpha}) = \mu\alpha[w_S + \gamma\hat{\mu}_S(\tilde{\alpha})] + (1 - \mu\alpha)[w_F + \gamma\hat{\mu}_F(\tilde{\alpha})] - D(\alpha). \tag{3}$$

Define

$$\Delta\hat{\mu}(\alpha) \equiv \hat{\mu}_S(\alpha) - \hat{\mu}_F(\alpha) = \frac{\sigma}{\mu(1 - \tilde{\alpha})}, \tag{4}$$

which describes the manager's reputation gain when the outcome is success. Then, the agent's choice of effort level satisfies the following incentive condition:

$$\mu[(w_S - w_F) + \gamma\Delta\hat{\mu}(\tilde{\alpha})] - D'(\alpha) = 0. \tag{5}$$

The optimization problem for the principal is

$$\max_{\alpha, w_S, w_F} \mu\alpha S - [\mu\alpha w_S + (1 - \mu\alpha)w_F] \tag{6}$$

subject to the agent's incentive constraint, the limited liability constraint $w_S,\ w_F \geq 0$, and the individual rationality constraint

$$EU(w_S, w_F, \alpha; \tilde{\alpha}) \geq 0 + \gamma\mu, \tag{7}$$

where 0 denotes the agent's reservation utility, and the agent's reputation is μ if not attending the project.

We solve the principal's problem following the two-step method *a la* Grossman and Hart (1983). Since the agent's career concern gives positive incentive to make effort, the principal can induce the effort level $\hat{\alpha} > 0$ even if $(w_S, w_F) = (0, 0)$, where $\hat{\alpha}$ satisfies

$$\mu\gamma\Delta\hat{\mu}(\hat{\alpha}) - D'(\hat{\alpha}) = 0 \tag{8}$$

To induce the effort level $\alpha > \hat{\alpha}$, the principal needs to give the agent a monetary incentive. Lemma 2 describes the optimal wage contract to induce effort $\alpha > \hat{\alpha}$ if the labor market believes that the effort level is $\tilde{\alpha}$.

Lemma 2. *Suppose that the labor market believes the effort level is $\tilde{\alpha}$. Then the optimal wage contract $(w_S^*(\alpha; \tilde{\alpha}), w_F^*(\alpha; \tilde{\alpha}))$ to elicit α is given by*

$$w_F^*(\alpha; \tilde{\alpha}) = 0, \quad w_S^*(\alpha; \tilde{\alpha}) = \frac{D'(\alpha)}{\mu} - \gamma\Delta\hat{\mu}(\tilde{\alpha}).$$

Proof. See the Appendix.

The principal's problem is choosing α to maximize her expected profit under the optimal contract given by Lemma 2. Define

$$E\Pi(\alpha; \tilde{\alpha}) \equiv \mu\alpha S - \mu\alpha w_S^*(\alpha; \tilde{\alpha}). \tag{9}$$

Then, the optimal equilibrium effort level α^* is obtained by

$$\alpha^* \in \text{argmax}_\alpha E\Pi(\alpha; \tilde{\alpha}), \tag{10}$$

where $\tilde{\alpha} = \alpha^*$ is satisfied on the equilibrium path.

We assume that $D'''(\cdot)$ is sufficiently positive to ensure that the principal's problem is globally concave. Furthermore, we focus on the interior solution where $\alpha^* > \hat{\alpha}$ is satisfied. We can obtain the following proposition;

Proposition 1. *Suppose that the principal can write an explicit contract that is not observable by the labor market. Then, the equilibrium effort level α^* is strictly increasing in γ and σ.*

Proof. See the Appendix.

As γ increases, the agent's career concern incentive is enhanced. Moreover, if σ is large and so the agent's ability is sufficiently uncertain, then the difference between $\hat{\mu}_S(\tilde{\alpha})$ and $\hat{\mu}_F(\tilde{\alpha})$ is also large, giving the agent incentive to obtain a good reputation.

4 The Observable Contract

If the labor market can observe contract clauses, the level of effort elicited by the contract becomes known, and so the principal can directly influence the market's belief through the contract.

The equilibrium path is characterized as follows:

1. The principal writes the contract to elicit α^{**}. By observing the contract, the labor market believes that the effort level is α^{**}. (The labor market forms its belief regarding the agent's type by using α^{**}.)

2. The agent chooses an effort level given the contract and the market's belief α^{**}.

3. The agent's choice of effort level coincides with α^{**} thorough the incentive constraint.

Note that the agent's incentive constraint is the same as in (5) for *given* market's belief about the agent's choice of effort level. The labor market cannot observe the agent's choice of effort level, so the agent cannot manipulate the market's belief. However, the principal can affect the market's belief by disclosing the wage contract. Then, the optimal wage contract to elicit α can be written as

$$w_F^{**}(\alpha) = 0, \quad w_S^{**}(\alpha) = \frac{D'(\alpha)}{\mu} - \gamma \Delta \hat{\mu}(\alpha). \tag{11}$$

Define

$$E\Pi(\alpha) \equiv \mu \alpha S - \mu \alpha w_S^{**}(\alpha). \tag{12}$$

Then, the equilibrium effort level α^{**} satisfies

$$\alpha^{**} \in \operatorname{argmax}_{\alpha} E\Pi(\alpha), \tag{13}$$

as the labor market knows that the principal is trying to induce $\tilde{\alpha}$ by observing contract clauses.

Properties of α^{**} are summarized in Proposition 2.

Proposition 2. *The equilibrium effort level under the observable contract α^{**} is greater than the equilibrium effort level under the unobservable contract α^{*}. Then, $\alpha^{**} > \alpha^{*}$. Also, α^{**} is strictly increasing in γ and σ.*

Proof. See the Appendix.

Proposition 2 states that if the contract is observable to the labor market, the principal can elicit a greater level of effort than they can when the contract is not observable. If the contract is observable, the change in the contract affects the agent's incentive in two ways: a direct effect on payment and an indirect effect on information externality thorough the market's belief updating. In the unobservable contract case, the second effect does not exist. That is, the principal can internalize the second effects by disclosing the contract.¶ Remember that the outcome of project is success with a probability of $\tilde{\mu}\alpha$ and failure with a probability of $1 - \tilde{\mu}\alpha$. Thus, an effect of the marginal increase of the agent's ability on the probability is α, that is, an effort level. Then, the larger level of α leads to the larger effect of the agent's ability on a probability of success, and so $\Delta\hat{\mu}(\alpha)$ is strictly increasing in

¶Under the observable contract, the labor market becomes more sensitive to the change of contract, and the principal fully anticipates the market's perception about the effort level and the agent's ability. Similar argument can be found in Kaya and Liu (2015), where the buyer can fully anticipate sellers' anticipations under the transparent price regime in the sequential bargaining model. Under the transparent regime, sellers become more sensitive to past price changes.

α. If the principal can internalize these effects by disclosing the contract, she will raise the level of α because this allows to reduce the compensation to the agent and to obtain at the same time a higher level of α. Hence the principal can implement a higher level of effort by raising a planned level of effort.[‖]

5 Conclusion

We analyzed the effects of disclosing explicit contract clauses on the agent's career concerns. We considered two cases: (i) when the explicit contract is unobservable for the labor market, and (ii) when it is observable. If the explicit wage contract is unobservable, the principal cannot influence the market's belief directly. The labor market updates its belief on the basis of the realized outcome and the inference of the agent's effort choice.

By disclosing contract clauses, the principal can inform the labor market about the induced effort level directly; that is, the principal can manipulate the market's belief through the observable contract. In such a case, the principal can induce a higher level of effort because she can control both the explicit incentive contract and career concern incentives.

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[‖]Although $\alpha^{**} > \alpha^*$ is always satisfied, a sign of $w_S^{**}(\alpha^{**}) - w_S^*(\alpha^*)$ on the equilibrium is ambiguous because both $D'(\alpha^{**}) > D'(\alpha^*)$ and $\Delta\hat{\mu}(\alpha^{**}) > \Delta\hat{\mu}(\alpha^*)$ hold.

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Appendix

Proof of Lemma 1. For given $\tilde{\alpha}$, from the Bayes' rule, we can calculate $\hat{\mu}_S(\tilde{\alpha})$ and $\hat{\mu}_F(\tilde{\alpha})$ as follows;

$$\begin{aligned}\hat{\mu}_S(\tilde{\alpha}) &= \int_0^1 \tilde{\mu}\frac{\tilde{\mu}\tilde{\alpha}f(\tilde{\mu})}{\int_0^1 \tilde{\mu}\tilde{\alpha}f(\tilde{\mu})d\tilde{\mu}}d\tilde{\mu} \\ &= \mu + \frac{\tilde{\alpha}\sigma}{\mu\tilde{\alpha}}, \end{aligned} \tag{A.1}$$

and

$$\begin{aligned}\hat{\mu}_F(\tilde{\alpha}) &= \int_0^1 \tilde{\mu}\frac{[1-\tilde{\mu}\tilde{\alpha}]f(\tilde{\mu})}{\int_0^1 [1-\tilde{\mu}\tilde{\alpha}]f(\tilde{\mu})d\tilde{\mu}}d\tilde{\mu} \\ &= \mu - \frac{\tilde{\alpha}\sigma}{1-\mu\tilde{\alpha}}, \end{aligned} \tag{A.2}$$

where we have used the fact that $\int_0^1 \tilde{\mu}^2 f(\tilde{\mu})d\tilde{\mu} = \mu^2 + \sigma$. □

Proof of Lemma 2. For given (w_S, w_F) and the market's belief $\tilde{\alpha}$, the incentive constraint (5) can be rewritten as

$$w_S - w_F = \frac{D'(\alpha)}{\mu} - \gamma\Delta\hat{\mu}(\tilde{\alpha}), \tag{A.3}$$

where the RHS of (A.3) is positive as long as α is greater than the career concern effort level $\hat{\alpha}$. Thus, we have $w_S > w_F$. If w_F is positive, the principal can reduce w_S and w_F without violating the incentive constraint; $w_F = 0$. Then, the optimal contract to elicit $\alpha > \hat{\alpha}$ is given by

$$w_S^*(\alpha) = \frac{D'(\alpha)}{\mu} - \gamma\Delta\hat{\mu}(\tilde{\alpha}), \quad w_F^* = 0.$$

Note that the agent's expected payoff under the optimal contract to induce α is

$$\mu\alpha w_S^*(\alpha) - D(\alpha) + \gamma[\mu\alpha\hat{\mu}_S(\tilde{\alpha}) + (1-\mu\alpha)\hat{\mu}_F(\tilde{\alpha})]. \tag{A.4}$$

On the equilibrium, $\tilde{\alpha} = \alpha$ is satisfied, and his expected payoff becomes

$$\mu\alpha w_S^*(\alpha) - D(\alpha) + \gamma\mu. \tag{A.5}$$

Since $\mu\alpha w_S^*(\alpha) - D(\alpha) > 0$, the agent's expected payoff is greater than his reservation utility $0 + \gamma\mu$, and so his participation is ensured on the equilibrium. □

Proof of Proposition 1. The principal's problem (10) yields

$$\max_{\alpha} \mu\alpha \left[S - \frac{D'(\alpha)}{\mu} - \gamma\Delta\hat{\mu}(\tilde{\alpha})\right], \tag{A.6}$$

and the first order condition is given by

$$\mu S + \mu\gamma\Delta\hat{\mu}(\tilde{\alpha}) = D'(\alpha^*) + \alpha^* D''(\alpha^*), \tag{A.7}$$

where $\tilde{\alpha} = \alpha^*$ is satisfied.[**]

We can easily see that, α^* is an increasing function of γ and σ, since $\gamma\Delta\hat{\mu}(\alpha) = \gamma\sigma/\mu(1-\mu\tilde{\alpha}) > 0$. □

Proof of Proposition 2. The principal's problem (13) yields

$$\max_{\alpha} \mu\alpha\left[S - \frac{D'(\alpha)}{\mu} - \gamma\Delta\hat{\mu}(\alpha)\right], \tag{A.8}$$

and the first order condition is given by

$$\mu S + \mu\gamma\Delta\hat{\mu}(\alpha^{**}) + \mu\alpha^{**}\gamma\frac{\partial\Delta\hat{\mu}(\alpha^{**})}{\partial\alpha} = D'(\alpha^{**}) + \alpha^{**}D''(\alpha^{**}).^{\dagger\dagger} \tag{A.9}$$

Note that $\partial\Delta\hat{\mu}(\alpha)/\partial\alpha = \sigma/(1-\mu\alpha)^2 > 0$. Thus, comparing (A.7) and (A.9), $\alpha^{**} > \alpha^*$ is established. The effects of changes of γ and σ on α^{**} are obvious. □

[**] The second order condition is given by $-2D''(\alpha^*) - \alpha D'''(\alpha^*) < 0$, which is satisfied if $D'''(\alpha^*) > 0$. We can see the similar assumption in Macho-Stadler and Pérez-Castrillo (2009).

[††] In this case, the second order condition is given by

$$2\mu\gamma\frac{\partial\Delta\hat{\mu}(\alpha^{**})}{\partial\alpha} + \mu\alpha\gamma\frac{\partial^2\Delta\hat{\mu}(\alpha^{**})}{\partial\alpha^2} - 2D''(\alpha^{**}) - \alpha D'''(\alpha^{**}) < 0,$$

where $\partial\Delta\hat{\mu}(\alpha^{**})/\partial\alpha = \sigma/(1-\mu\alpha^{**})^2 > 0$ and $\partial^2\Delta\hat{\mu}(\alpha^{**})/\partial\alpha^2 = 2\mu\sigma/(1-\mu\alpha^{**})^3 > 0$. Then, the second order condition is satisfied for sufficiently large $D'''(\alpha^{**}) > 0$.