Job Protection vs. Contracts At-Will: Trading-off Entrenchment and Shirking

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Abstract

I take an efficient contracting approach to answer the question how much "job protection" to offer employees, in particular those at the top of organizations. Given their privileged information or formal authority, senior managers who are *not* given such protection are likely to take opportunistic actions that make them less dispensable. The optimal employment contract trades off the resulting inefficiencies that arise from such "self-made" job security with the reduced incentives and higher compensation costs under explicit employment protection. One implication of the model is that more senior managers, such as CEOs, should receive both higher rents and more protection, e.g., through contracts that are explicitly not at-will or that specify a longer duration.

Keywords: Employment agreements; At-will contracts; Contract duration.

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1 Introduction

In this paper, I solve for the optimal employment contract for an agent who must be remunerated for working hard and who must be incentivized to take decisions in the firm's rather than only his own interest. The key novelty of the analysis is my interest in an often overlooked feature of employment agreements, in particular for more senior employees including CEOs: Contract provisions that offer (more) employment protection, for instance through the explicit stipulation of contract duration.

My main empirical motivation is the recent empirical analysis of CEO employment contracts in Schwab and Thomas (2006). They ask whether CEO contracts are different from the standard "at-will" contracts used for lower-level employees and find that CEOs are not generally "at-will employees". CEOs' agreements offer far more protection, in particular through contracts for a definite term of years (almost 87% of all cases) and additional rights at termination. Schwab and Thomas (2006, p. 233) conclude: "This is quite different from the protections available to other workers, who are generally at-will employees without contracts."

My key finding is that the optimal degree of such employment protection must be chosen in light of the different tasks that an agent faces. In terms of expected compensation costs, it is cheapest for the firm *not* to offer any such protection, as this reduces the agent's incentives to work hard. However, in my model this will negatively impact on the efficiency of decision making. In essence, the respective employee will then use his discretion to take opportunistic actions (e.g., in the choice of firm or division strategy) that make him less dispensable, thereby substituting explicit employment protecting for "self-made" protection. Through such "self-made" employment protection, the agent protects himself against dismissal or future wage cuts under the threat of dismissal.

The key implication of my model is that employees who have more discretion and whose decisions have more impact on firm profits will be given *both* higher compensation, including a higher rent above their market wage, *and* employment protection. In my model, this is not the result of inefficient contracting under a rigged system of governance, where powerful insiders enrich themselves, but it is efficient in light of the different weights that are given to different tasks that employees perform.

My theoretical analysis, based on a simple agency model of multi-tasking, ties into a recent empirical literature that looks into the details of employment agreements, in particular for CEOs. Importantly, for such senior managers legal provisions that protect workers' rights or also agreements with trade unions should all be less important. At one extreme of the spectrum of employment agreements that I consider is a contract "at will", for which I stipulate that at any point of time the firm can dismiss the respective employee. This gives the firm a strong bargaining position in possible renegotiations.[1] At the opposite extreme is a contract that offers full employment protection, so that the respective employee can resist any attempt to renegotiate his wage downwards under the threat of firing. I also consider intermediate cases, where the degree of protection represents a more gradual choice, as achieved, for instance, through contract duration and, thereby, through the "penalty" that a firm would have to pay when dissolving an employment agreement prematurely.[2]

Gillan, Hartzell, and Parrino (2009) provide another recent analysis of CEO employment agreements. Their focus is different from that of Schwab and Thomas (2006), as they expand the sample to include those CEOs who had no explicit agreement. Their empirical analysis is twofold, identifying both the determinants of when a contract is explicit and the determinants of contract duration under explicit agreements. They interpret their finding in terms of protecting employees from opportunistic behavior by the firm. Employees who have more to loose when their agreements are altered unilaterally should obtain an explicit contract or a contract with longer duration. My take is somewhat different, as I argue that through such explicit employment protection the firm protects *itself* against opportunistic decisions that, in particular, a senior executive could take so as to make himself less dispensable. The role of potential inefficiencies is important. It ensures that the form of the employment agreement is not driven alone by risk sharing motives, which may be of less relevance for wealthy senior executives. In fact, I thus undertake my analysis under the assumption of risk neutrality.

[1] "[E]mployers and employees can avoid a possible charge of breach if they stick to the practice of modifying terms only by mutual consent. ... Mutual agreement on modifications of terms does not preclude wage changes—employees may agree to a wage cut if the alternative is being laid off" (Malcomson (1997), p. 1921). If the firm tries to renegotiate doewnards an employee's compensation and if the employee rejects the firm's offer, the firm has two options. It can either continue employment or fire the employee. If employment is continued, the existing wage contract remains in place: "[R]efusal of an offer by either party followed by continued employment leaves the contract unchanged" (Malcomson (1997), p. 1933).

[2] Verkerke (1995, p. 863) notes that, at least for the US, "courts in virtually every American jurisdiction continue to presume that an indefinite term employment contract is terminable at will by either party."

I use a multi-task agency setting. Though this is in line with the seminal contribution of Holmström and Milgrom (1991), a key difference is that there is only one performance measure, namely output. My focus is not on the determinants of incentive pay but, instead, on a comparison of other contractual provisions relating to employment protection. This is also the key difference to other models of multi-tasking that take, similar to my paper, a sequential structure, most notably Levitt and Snyder (1997), Lambert (1986), or Demski and Sappington (1987).

I do not intend to review the vast literature on incentive pay. The "self-made" employment protection in my model is somewhat akin to the notion of "entrenchment" used in several papers, such as Lambert and Larcker (1985), Knoeber (1985), Almazan and Suarez (2003), or Inderst and Müller (2010). A key difference is the comparison of different types of employment agreements that I undertake in this paper. Finally, I borrow the notion of at-will contracts, which offer no legal protection from the threat of dismissal, from earlier contributions in the labor literature. In contrast to, for instance, the seminal papers by Kahn and Huberman (1988) and Prendergast (1993), my focus is not on employer opportunism but, instead, on the opportunistic behavior of employees. In fact, in my model the employee can protect himself against employer opportunism through making himself less dispensable.

The rest of this paper is organized as follows. Section 2 introduces the baseline model. Sections 3 and 4 derive the optimal contract under two different types of employment agreements. Section 5 compares their performance. In Section 6 we introduce a more gradual form of employment protection. Section 7 concludes.

2 The Model

I consider a single agent working for a principal. The agent could be the CEO of a firm, in which case the principal would represent the interest of all owners. Alternatively, the principal could be the company's headquarters dealing with a particular division manager, or any senior manager dealing with a subordinate. I will be more specific about particular applications and the respective empirical implications after presenting the key results.

Timing, Tasks, and Payoffs. The model has the following time line. Initially, at $t = 1$, the agent is hired. As noted above, the treatment of different compensation contracts at this stage will be key to our analysis. At the final stage $t = 4$ all payoffs are realized. I presume that both the firm and the agent are risk neutral. I also abstract from discounting. There are two interim periods. In $t = 2$ the agent has to perform two tasks, which I specify next, while at $t = 3$ the compensation contract can be renegotiated, as is discussed subsequently.

In $t = 2$, the agent has to exert effort so as to find ways how to make the firm more profitable. But he also has to exert discretion in determining whether to then change the firm's strategy or that of his business unit in this way, e.g., by introducing new products or making changes to the internal organization. In what follows, to be specific, I will say that the agent, first, has the task to find a new strategy and, second, must decide whether to implement a new strategy, provided he was able to find one.

Precisely, at the beginning of $t = 2$ the agent must exert unobservable effort, which comes at private disutility $c > 0$, to find a new strategy. Without such effort no new strategy is available. Under the existing strategy, the firm realizes in $t = 4$ the payoff $x_h > 0$ with probability $0 < q_0 < 1$, while with the residual probability, $1 - q_0$, the payoff is $x_l < x_h$.[3] Denote $\Delta = x_h - x_l$. A new strategy is described by the respective probability q with which the high outcome x_h, instead of x_l, is realized. From an ex-ante perspective, $q \in [0, 1]$ is drawn from the distribution function $F(q)$ with everywhere strictly positive density $f(q) > 0$. In $t = 2$ it is at first privately learned by the agent.

At the end of period $t = 2$, provided that a new strategy is available, the agent can decide whether to implement it or whether to stick to the existing strategy. The agent's strategy choice is not verifiable, but for our subsequently introduced renegotiations (in $t = 3$) it is assumed to be known by the firm until then. The payoff consequences of a new strategy for the firm are obtained immediately from a comparison of q with q_0. What this entails for the agent, however, will be described next, as this depends crucially on the respective compensation contract.

Dispensability of the Agent and Employment Relationship. In $t = 3$ the employment contract can be renegotiated, and the firm could also consider replacing the agent. Likewise, the agent could leave the firm.

[3] The specification of only two payoff realizations is common in the literature and allows, first, to obtain explicit solutions for the optimal incentive contracts, and, second, to conduct a clear-cut comparative analysis.

When no new strategy was implemented, the agent is fully replacable. In this case, I stipulate that when hiring a new agent, the firm's profitability in $t = 3$ would remain the same (i.e., as captured by q_0). Instead, when the agent has implemented a new strategy in $t = 2$, then he becomes less dispensable. This is the key assumption in my model. For ease of exposition, I stipulate that the agent is then fully indispensable, so that when he is replaced after "his" new strategy was implemented, the likelihood of realizing the high outcome x_h goes down to zero.

The renegotiation in $t = 3$ is captured by a simple game. We grant the firm the right to make a new offer at this stage. If this is rejected by the agent, then the firm can still choose whether to optimally dismiss the agent, provided that the agent's original contract allows for such dismissal. For the game of renegotiation in $t = 3$, we stipulate that at this point the firm knows the (non-verifiable) profitability of the chosen strategy.[4]

Employment Contracts. We thus come finally to the specification of the contract that is offered by the firm in $t = 1$. As noted in the Introduction, in my baseline analysis I compare two different types of employment agreements. The first is a contract at-will, under which the agent's principal, e.g., the board in case of a CEO, can decide to dismiss the agent in $t = 3$. In this case, the renegotiation offer made by the firm in $t = 3$ becomes important. The second is a contract that offers the agent job protection. In particular, I presently assume that this protection is complete in the sense that the agent can not be dismissed against his will. In this case, the renegotiation offer made by the firm in $t = 3$ will become superfluous.

In each case, apart from allowing or disallowing dismissal, the compensation contract can be made contingent on the following outcomes. A contract can specify a base wage w, that is paid unconditionally, and, in addition, a bonus b that is paid only in case the high outcome ($x = x_h$) is ultimately realized.

As a final ingredient of the model, we stipulate that any employee, i.e., both the original agent as well as a new hire, has a market wage of $W \geq 0$.

[4] To be specific, for the subsequently obtained results we only need that the firm knows whether a new strategy has been implemented or not. Still, observability (at $t = 3$) of the profitability q shortens the exhibition as then the analysis of the game of renegotiation is rather immediate.

3 Contracting under Employment Protection

Recall that the presently considered contract does not give the firm the right to dismiss the agent before the final period $t = 4$. Still, period $t = 3$ could be important as there the agent may decide to leave the firm, which makes the firm strictly worse off when a new strategy was implemented. In what follows, we first solve the *relaxed* problem (for the compensation offered in $t = 1$), where this additional constraint is not considered. We argue below and prove in Proposition 1 that the derived contract would then indeed satisfy this constraint, as under this contract the agent never wants to leave the firm.

We next solve the game backwards. We first solve for the agent's strategy implementation problem at the end of $t = 2$. We then derive the agent's incentives to exert effort at the beginning of period $t = 2$. Finally, we solve for the optimal compensation contract offered in $t = 1$. Note that throughout the paper we stipulate that the firm wants the agent to exert effort in $t = 2$. After Proposition 1 we provide a sufficient condition for when this is indeed the case.

Incentive Problems. Define the expected compensation conditional on the success probability that the implemented strategy realizes:

$$w(q) = w + qb. \tag{1}$$

If the agent has identified a new strategy with success probability q, in $t = 2$ he will thus compare the respective expected compensation $w(q)$ with the expected compensation under the original strategy, $w(q = q_0)$. As long as $b \geq 0$, so that the agent participates in the firm's success, the agent will thus optimally choose to implement the new strategy if and only if $q \geq q_0$. This is the first-best decision rule. Hence, the agent's decision is always first-best efficient when $b \geq 0$. That $b \geq 0$ must hold in equilibrium follows next from the agent's second incentive problem of exerting effort at the beginning of $t = 2$. Exerting effort so as to identify a new strategy is only optimal for the agent if the respective expected payoff

$$F(q_0)w(q_0) + \int_{q_0}^{1} w(q)f(q)dq - c$$

does not fall below the expected payoff from shirking, $w(q_0)$. After rearranging terms, this is the case if

$$b\int_{q_0}^{1}\left(q-q_0\right)f(q)dq\geq c. \tag{2}$$

That is, the incentive constraint requires the bonus b to be sufficiently large so that there is a sufficiently large difference between the expected compensation under a new strategy and the expected compensation under the initial strategy. Note that expression (2) already incorporates the agent's subsequently optimal implementation decision, namely to implement the new strategy only if the realized profitability is not below that of the initial strategy, $q\geq q_0$.

Compensation Design. Denote for given q the firm's expected payoff by

$$\pi(q)=x_l+q\Delta-w(q).$$

Recall now that we stipulate that the firm wants to incentivize effort. Given that with $b\geq 0$ the implementation decision is always uniquely pinned down (to be efficient), the firm's optimization problem can be described as follows. The firm chooses (w,b) so as to maximize its expected profits

$$\Pi=F(q_0)\pi(q_0)+\int_{q_0}^{1}\pi(q)f(q)dq$$

subject to the incentive constraint (2), the agent's ex-ante participation constraint

$$F(q_0)w(q_0)+\int_{q_0}^{1}w(q)f(q)dq-c\geq W, \tag{3}$$

and the limited liability constraint, which is $w\geq 0$.

By optimality, the incentive constraint (2) must bind at an optimum, so that we can set

$$b=\widehat{b}=\frac{c}{\int_{q_0}^{1}\left(q-q_0\right)f(q)dq}. \tag{4}$$

Consider now the participation constraint (3). Given that the agent has a market wage of W and given that he will incur private disutility c, in expectation the employment agreement must thus promise the agent at least $W+c$. If this is feasible, then by optimality for the firm the base wage w is chosen so as to make the participation constraint just binding. For this we first rearrange the participation constraint (3) to obtain

$$[w+bq_0]+b\int_{q_0}^{1}\left(q-q_0\right)f(q)dq\geq W+c.$$

After substitution for $b = \widehat{b}$, this yields at equality the specification

$$w = \widehat{w} = W - \frac{q_0 c}{\int_{q_0}^{1} (q - q_0) f(q) dq}. \tag{5}$$

This is, however, only feasible when $\widehat{w} \geq 0$. Otherwise, if $\widehat{w} < 0$, it is optimal for the firm to choose w as low as possible, $w = 0$, given that this reduces compensation costs and does not affect the agent's incentives. In this case, i.e., if $\widehat{w} < 0$, the agent obtains an ex-ante rent equal to

$$R = \frac{q_0 c}{\int_{q_0}^{1} (q - q_0) f(q) dq} - W. \tag{6}$$

Proposition 1 *If the employment agreement offers the agent full protection, thereby ensuring that compensation is not renegotiated at the interim period $t = 3$, the following characterization applies. To incentivize effort, the optimal bonus equals $b = \widehat{b}$, as given by (4). If*

$$c \frac{q_0}{\int_{q_0}^{1} (q - q_0) f(q) dq} \leq W, \tag{7}$$

the optimal base wage equals $w = \widehat{w}$, as given by (5), and the agent does not realize a positive rent. Otherwise, if condition (7) does not hold, the optimal base wage is $w = 0$, and the agent realizes a strictly positive rent $R > 0$, as given by (6). The agent's decision rule is always first-best efficient: He implements a new strategy if and only if $q \geq q_0$.

Proof. Given the derivation in the main text, it remains to check whether the contract is feasible as the agent does not leave the firm in $t = 3$. To see this, note that when $w = \widehat{w}$ and $b = \widehat{b}$, we have $w(q_0) = W$ and $w(q) > W$ for all $q > q_0$, so that, as he makes his optimal implementation choice, it is thus indeed always optimal for him to stay with the firm. When he obtains a rent, as (7) does not hold, this holds a fortiori. Precisely, we then have $w(q_0) > W$ and thus also $w(q) > W$ for all $q > q_0$. **Q.E.D.**

The characterization in Proposition 1 proves to be relatively standard. In essence, there is no conflict of interest along the second task of the agent, namely that of implementing the best strategy. The residual incentive problem is then a standard moral hazard problem (in effort) under limited liability. If condition (7) does not hold, which is always the case when the agent's reservation value is sufficiently low, then the agent extracts a rent, which increases the compensation cost for the firm.

To conclude the characterization of the equilibrium when the agent receives job protection, it remains to ensure that the firm indeed wants to incentivize the agent to exert effort. Firm profits are given by

$$\Pi = x_l - w + \left[\Delta - \widehat{b}\right]\left[q_0 + \int_{q_0}^{1} (q - q_0)\, f(q)dq\right]$$

when the agent is incentivized to exert effort and by

$$\Pi_0 = x_l - W + \Delta q_0,$$

otherwise. When condition (7) holds, $\Pi \geq \Pi_0$ thus holds if

$$S := \Delta \int_{q_0}^{1} (q - q_0)\, f(q)dq - c \geq 0,$$

where S equals the total expected surplus from inducing effort. Otherwise, when the agent obtains a rent as (7) does not hold, the efficiency gains must be sufficient so that it is still worthwhile for the firm to induce effort: $S \geq R$. One way to express this condition is in terms of a lower boundary on the "upside" from success, Δ:

$$\Delta \geq \frac{1}{\int_{q_0}^{1} (q - q_0)\, f(q)dq}\left[c\left(1 + \frac{q_0}{\int_{q_0}^{1} (q - q_0)\, f(q)dq}\right) - W\right]. \tag{8}$$

To complete our characterization, we thus stipulate that (8) holds.

Finally, we conduct a comparative analysis in the agent's rent and, thereby, in the firm's cost of compensation.

Corollary 1 *The agent's rent R and thus the firm's cost of compensation are higher when it is more costly to exert effort (higher c) or when effort is less likely to result in a new strategy that is better than the firm's present strategy. The latter holds when the likelihood of success is higher under the present strategy (higher q_0) or when a new strategy is less likely to have success ($F(q)$ decreases in the sense of strict First-Order Stochastic Dominance).*

Proof. The assertions follow from the characterization of R in (6). Precisely, note first that

$$\begin{aligned} \frac{dR}{dc} &= \frac{q_0}{\int_{q_0}^{1} (q - q_0)\, f(q)dq} > 0, \\ \frac{dR}{dq_0} &= c\frac{\int_{q_0}^{1} q f(q)dq}{\left[\int_{q_0}^{1} (q - q_0)\, f(q)dq\right]^2} > 0. \end{aligned}$$

The assertion regarding the distribution $F(q)$ follows finally as, from partial integration we have that

$$\int_{q_0}^{1} (q - q_0)\, f(q)dq = 1 - q_0 - \int_{q_0}^{1} F(q)dq$$

and as $F_i(q) > F_j(q)$ for $0 < q < 1$ when F_j dominates F_i in the sense of strict First-Order Stochastic Dominance. **Q.E.D.**

4 Contracting under the Threat of Dismissal

In this Section, I consider an employment agreement that does not provide the agent with job protection. Precisely, the agent can be fired at $t = 3$. Though in equilibrium the agent will not be fired, the credible threat to do so will be used by the employer to keep down the agent's wage. Precisely, this happens through renegotiations in $t = 3$. But, of course, the threat of firing must be credible to make such renegotiations effective.

In contrast to the preceding analysis, where renegotiations were not of relevance, the analysis of the game now starts (backwards) with period $t = 3$. Once the outcome of renegotiations is characterized, I then turn again to an analysis of $t = 2$ (incentive problems) and $t = 1$ (contract design).

Renegotiations in $t = 3$. Recall that at this stage the agent may or may not have implemented a new strategy. This is observable by the employer (albeit not verifiable). When no new strategy was implemented, the agent is fully dispensable: He has not made himself more valuable to the firm than any other "outsider" whom the firm would bring in to replace the agent. Suppose that the original employment contract prescribes $w(q_0) = w + bq_0 > W$. Clearly, in this case the firm would not find it optimal to continue employing the agent under this contract. Irrespective of whether the firm fires the agent or whether the firm makes an optimal take-it-or-leave-it offer at the renegotiation stage, which promises exactly $w(q_0) = W$, the agent thus realizes W.[5] This is the key implication of the threat of dismissal and the renegotiation that this allows in $t = 3$: A shirking agent will *always* realize just the value of his outside option. But the same also applies to an agent who has not shirked but who subsequently chose not to implement a new strategy.

[5] A straightforward way to break this indifference for the firm would be to appeal to ε costs of hiring an outsider and letting ε go to zero.

The outcome is different when a new strategy was implemented. As this is the agent's "own" strategy, he has thereby made himself less dispensable. In particular, recall that we have specified that with a new strategy only the incumbent agent can generate value above x_l: With a new agent, the firm would realize only $q = 0$, instead.

In principle, we now have several cases to distinguish, depending on the firm's and the agent's optimal actions under the existing contract. When $w(q) < W$ the agent would leave the firm. Next, we must distinguish between whether the firm can make a credible renegotiating offer or not. An offer that reduces the agent's expected compensation is credible whenever, following rejection, the firm would honour its threat to dismiss the agent.[6] The threat is only credible for given q whenever $\pi(q) < x_l - W$.

Lemma 1 *Under an employment agreement that does not protect the agent from dismissal, renegotiations in $t = 3$ lead to the following outcome:*
i) When the agent did not implement a new strategy, his compensation will always equal his market wage W.
ii) When the agent implemented a new strategy with profitability q, the existing agreement (w, b) remains in place if

$$w(q) \geq W \text{ and } \pi(q) < x_l - W. \tag{9}$$

Otherwise, the expected compensation is renegotiated to W.

Incentive Problems. According to Lemma 1 we would have to distinguish various cases for the agent's expected compensation when a new strategy was implemented. However, we can shortcut the analysis considerably. What allows this to do is the observation that the agent himself chooses optimally when to implement a new strategy. As without a new strategy his compensation is always W, he will do so only when $w(q) \geq W$. The case where the agent would strictly prefer to leave the firm after implementing a new strategy can thus be ignored. Turn next to the second part in condition (9). Clearly, this holds for all q whenever $w \leq W$. Suppose that $w > W$, in which case $w(q) > W$ would hold

[6] Recall that we stipulated that at $t = 3$ also the firm knows the realized q. As will be shown later, however, under the optimal compensation contract there will only be renegotiations when the agent shirks. As there is thus no renegotiation for all q under which the new strategy is adopted, one can show that the equilibrium outcome remains unchanged when, instead, the firm could not observe q under the new strategy (so that an offer must be made under uncertainty).

for all q, provided that $b \geq 0$, so that the agent would want to choose the new strategy regardless of the realization of q. Thus, in case the firm wants to incentivize the agent also to make a judicious choice (in its own interest) when implementing the old or the new strategy, $w < W$ must hold. We first assume that it is indeed optimal for the firm to appropriately incentivize the agent along both tasks. Subsequently, we will again provide sufficient conditions that ensure that the resulting firm profit is higher than otherwise.

With these observations, we restrict consideration to $b > 0$ and $w < W$. We can now proceed to set up the agent's incentive constraints. For the agent's implementation task at the end of $t = 2$, we obtain a unique cutoff q^* solving

$$q^* = \frac{W - w}{b}, \tag{10}$$

so that the agent prefers to undertake the new strategy if and only if $q \geq q^*$. That $q^* > 0$ follows from $W > w$, while for completeness we set $q^* = 1$ when $W - w > b$, though this case will not arise in equilibrium.

Turn now to the start of period $t = 2$, where the agent must exert effort. Recall that the agent's compensation without a new strategy is simply his market wage W. He also earns the market wage when he identified a strategy but chooses not to implement it, which is the case if $q \leq q^*$. Otherwise, the agent is paid according to the contract (w, b). After rearranging terms, the agent then finds it optimal to exert effort if and only if

$$\int_{q^*}^{1} [w(q) - W] \, f(q)dq \geq c. \tag{11}$$

That is, the expected compensation *conditional* on that a new strategy is implemented must sufficiently exceed the market wage W. Otherwise, it is not worthwhile for the agent to undertake the respective effort at cost c.

Compensation Design. At $t = 1$, the firm chooses a contract to maximize its ex-ante profits, which are now

$$\Pi = \int_{q^*}^{1} [\pi(q) - w(q)] \, f(q)dq + F(q^*) \, [\pi(q_0) - W] \, . \tag{12}$$

Note that we have already used here the agent's optimal cutoff q^*, as given by (10), and that without a new strategy the profitability is given by the likelihood q_0. The firm's program is thus to maximize Π subject to the incentive constraint (11) and the constraint that $w \geq 0$.

By optimality for the firm, the agent's incentive constraint (11) will again bind. After substitution into the firm's objective function Π in (12), this transforms to

$$\Pi = \int_{q^*}^{1} \omega(q) f(q) dq + F(q^*)\omega(q_0) - (W + c) \tag{13}$$

where we use the conditional surplus function

$$\omega(q) = x_l + q\Delta.$$

In words, the firm as the residual claimant would realize the highest possible profits when the subsequent implementation cutoff q^* maximizes efficiency. This is the case when $q^* = q_0$.

I ask first when the (first-best) outcome is feasible, so that the highest possible firm profits can be realized. This holds when, using the cutoff-rule (10),

$$q_0 = \frac{W - w}{b} \tag{14}$$

holds together with the binding incentive constraint (11), again evaluated at $q^* = q_0$:

$$\int_{q_0}^{1} [w(q) - W] f(q) dq = c. \tag{15}$$

After substituting for $w(\cdot)$, the two conditions (14) and (15) can be solved to obtain for the (at-will) compensation contract the bonus $b = \widehat{b}$, as obtained in (4), and the base wage $w = \widehat{w}$, as obtained in (5). We comment on the equivalence to the outcome with job protection, at least in the present case, below, when we compare the two types of employment contract. The choice of $b = \widehat{b}$ and $w = \widehat{w}$ together ensure, also under a contract at-will, that the agent, first, exerts effort so as to generate a new strategy and, second, implements the new strategy if and only if it is efficient. The agent does not realize an ex-ante rent in this case. He only realizes a compensation $w(q) > W$ for all $q > q^*$, while $w(q^* = q_0) = W$, so that he indeed chooses the efficient cutoff-rule.

When the characterized (first-best) contract stipulates that $\widehat{w} < 0$, this is not feasible, given the constraint that $w \geq 0$. Thus, in this case the optimal (at-will) employment agreement can not be made sufficiently steep. It is then optimal to choose the base wage as low as possible, $w = 0$, and adjust the bonus b until the incentive constraint (11) just binds. (The left-hand side of (11) is strictly increasing in b, taking into account also the agent's optimal adjustment of q^*.) Then, however, the resulting cutoff q^* will be inefficiently low: $q^* < q_0$. The compensation that the agent must obtain in expectation so as to exert effort in the first place now distorts his decision whether to implement a new strategy. So as to ensure himself the respective wage $w(q)$, rather than being paid only his market wage W, the agent inefficiently often implements "his own" new strategy. Put differently, under the optimal at-will contract, which does not give him employment protection, the agent will then opt for "self-made protection", namely by making himself indispensable through implementing his own strategy.

Proposition 2 *The unique optimal ("at-will") employment agreement, where the firm retains the right of dismissal, is characterized as follows. If condition (7) holds, then the agreement specifies a bonus $b = \widehat{b}$ and a base wage, as characterized in (4) and (5). In this case, the agent exerts effort and implements a new strategy if and only if this is efficient: $q \geq q^* = q_0$. If (7) does not hold, the base wage is set as low as possible, $w = 0$, while the optimal bonus b is set so that the incentive constraint (11) just binds. In this case, the agent implements a new strategy inefficiently often, $q^* < q_0$, so as to thereby ensure himself a higher compensation by making himself less dispensable.*

Proof. Observe first that if the first best is feasible, which by construction implies that all of the surplus goes to the firm, then it is indeed uniquely optimal to choose the respective contract $(\widehat{w}, \widehat{b})$. This is the case if condition (7) holds.

Suppose now that this does not hold. Observe first that from optimality the incentive constraint (11) must still hold with equality. If this was not the case, then the firm would be better off by adjusting the contract as follows. When still $w > 0$, then while leaving q^* unchanged, the firm could adjust downwards both b and w, which would unambiguously improve profits. When $w = 0$ and the incentive constraint is slack, which as (7) does not hold implies that $q^* < q_0$, the firm would be strictly better off by adjusting b downwards, which would also bring up q^*. If (7) does not hold, the optimal bonus, together with the resulting cutoff q^*, thus uniquely solves

$$b = \frac{c}{\int_{q^*}^{1}(q - q^*)f(q)dq} \tag{16}$$

together with (10) for q^*. From substituting now $b = W/q^*$, given that $w = 0$, we have for q^* the requirement that

$$W \int_{q^*}^{1} \left[\frac{q}{q^*} - 1\right] f(q)dq = c. \tag{17}$$

Q.E.D.

Comparative Analysis. Intuitively, the tension between the agent's two tasks becomes stronger as the firm must pay a higher expected compensation to elicit effort, given that c increases. Then, the higher expected compensation, as promised under a new strategy, induces the agent to implement a new strategy more frequently, i.e., also for lower values of q. Also, when the market wage is lower, which also represents the agent's compensation following renegotiations under the old strategy, the incentives for the agent to make himself indispensable are higher, which pushes down q^*. For a third comparative result, all of which are made formal in the proof of Corollary 1, suppose that it is a priori less likely that new strategy is (highly) profitable. To still incentivize the agent, the bonus must increase, which once again distorts more his implementation choice.

Corollary 2 *Under the optimal ("at-will") employment agreement, where the firm retains the right of dismissal, the agent's decision becomes more distorted (lower q^*) or, alternatively, condition (7), which ensures that still $q^* = q_0$, becomes stricter if:*
i) it is more costly for the agent to exert effort (higher c);
ii) effort is less likely to result in a strategy that is better than the firm's present strategy, i.e., the likelihood of success is higher for the present strategy (higher q_0) or a new strategy is less likely to have success ($F(q)$ decreases in the sense of strict First-Order Stochastic Dominance);
iii) or incentives for the agent to make himself more indispensable are higher as his market wage is lower (lower W).

Proof. Consider first condition (7). From the derivations in Corollary 1 it is immediate that the constraint is relaxed when c decreases, q_0 decreases, $F(q)$ increases in the sense of strict First-Order Stochastic Dominance. As W only influences the right-hand side, also this comparative analysis is immediate. We next consider the case where (7) does not hold, so that $q^* < q_0$.

When condition (7) does not hold, we conduct a comparative analysis of q^*. For the comparative results in W and c note that the left-hand side of (17) is strictly increasing in W and the right-hand side strictly increasing in c, while the left-hand side is strictly decreasing in q^*. (We can also, given continuous differentiability, apply the implicit function theorem.) Further, the left-hand side of (17) increases following a strict First-Order

Stochastic Dominance shift in $F(q)$, which follows as

$$\int_{q^*}^{1}\left[\frac{q}{q^*}-1\right]f(q)dq=\frac{1-q^*}{q^*}-\frac{1}{q^*}\int_{q^*}^{1}F(q)dq.$$

Finally, note that q_0 does not affect q^*, so that in this respect the assertion holds only weakly. **Q.E.D.**

It remains to ask when it is indeed optimal for the firm to align interests along both tasks. Clearly, we must consider only the alternative where the firm does not incentivize effort. (Note that the agent does not receive a rent under the contract characterized in Proposition 2.) When (7) holds, the condition for when eliciting effort is indeed optimal is again $S \geq 0$: The first-best efficient surplus must then be higher. When (7) does not hold, so that $q^* < q_0$, we must compare Π, as given in (13), to Π_0, which results in the condition

$$\Delta \int_{q^*}^{1} (q-q_0)\, f(q)dq - c \geq 0, \tag{18}$$

where q^* is determined implicitly in Proposition 2 (equation (17)). As the difference Δ does not enter the derivation of q^*, condition (18) holds surely whenever this upside from success is sufficiently. We assume that this is indeed the case, so that our characterization of the optimal at-will contract applies.

Discussion. The focus of this paper is on a comparison of different employment agreements that offer various degrees of job protection. Nevertheless, also the form of the characterized (on-the-job) pay, (w, b), deserves some comments. Under the optimal at-will contract, it is the threat of dismissal that disciplines the agent to undertake effort so as to, thereby, generate a new strategy. To satisfy the respective incentive constraint (11), the contract (w, b) only has to generate a sufficiently high *expected* compensation. The form of the compensation, namely incentive pay with $b > 0$, is, instead, dictated by the second objective, namely to ensure that the agent does not undertake a new strategy inefficiently often.

5 Comparison

I now compare the employment agreements characterized in Propositions 1 and 2. The key distinction is whether condition (7) holds or not. If it holds, then the first-best contracts are feasible in both cases. Otherwise, we must compare the respective second-best oucomes.

First Best. As already noted, the respective condition when the first best can be obtained without leaving a rent to the agent is the same in both cases, i.e., expression (7). In this case, also the choice of the base wage and that of the bonus are the same, namely $b = \widehat{b}$ and $w = \widehat{w}$. This is at first remarkable, given that the incentive component serves two different purposes under the two considered employment agreements. With employment protection, $b = \widehat{b} > 0$ is necessary so as to induce the agent to exert effort. With an agreement at-will, $b = \widehat{b} > 0$ serves the purpose of subsequently inducing an efficient strategy choice, while the threat of dismissal provides incentives for the agent to exert effort.

Second Best. When (7) does no longer hold, we must compare the second-best outcomes. This comparison is at the heart of the present paper.

With employment protection, we know that always $b = \widehat{b}$ holds. Instead, when (7) does not hold, the bonus is strictly higher under the at-will contract: $b > \widehat{b}$. In both cases, however, the base wage is still the same, as it is chosen as low as possible: $w = 0$. Still, the employee is worse off under the at-will contract. With positive probability he will be forced to accept a downwards adjustment of his compensation, namely to W. As a consequence, while under the at-will contract he does not receive a rent, the employee realizes a strictly positive (ex-ante) rent $R > 0$ if he is protected against dismissal. The drawback for the firm under an at-will contract is a loss in efficiency, which equals

$$L = \Delta \int_{q^*}^{q_0} (q_0 - q) f(q) dq.$$

With this at hands, the comparison of firm profits between the two alternative agreements is straightforward. The firm strictly prefers the contract at-will if and only if $L < R$, so that the loss in surplus is smaller than the rent that is left to the agent. Bringing out this trade-off is the key contribution of this paper. In what follows, we ask in terms of the model's primitives when either type of employment agreement performs better.

Implications. Note that the loss in surplus given $q^* < q_0$ is strictly higher when there is more at stake, as Δ is higher. Note also that the realized cutoff q^* does not depend on Δ. This is the case as the agent cares about the bonus but not about the firm's upside. Also, the rent R under an at-will agreement is independent of Δ. Consequently, we can conclude that it is strictly optimal for the firm to protect the employee from the threat of dismissal when Δ is sufficiently large. This key observation accords well with the motivating discussion in the Introduction. Arguably, CEOs and other senior executives are more likely to have discretion over decisions that have a large effect on firm profits. If these employees make inefficient decisions so as to thereby generate "self-made" protection, namely by making themselves less dispensable, then the loss in firm profits far outweighs the benefits that an at-will contract would offer in terms of a lower compensation. Employees higher up in an organization's hierarchy should thus enjoy both an additional "rent" (over and above their market wage) *and* contractual provisions that protect them against dismissal.

From the observations in Corollary 1 and Corollary 2 we know that both the rent R and the loss in surplus L are affected in the same way by some of the key parameters of the model. That is, both the agent's rent under employment protection and the loss in efficiency under an at-will contract are higher when it becomes harder to incentivize the agent to exert effort (higher c, higher q_0, FOSD decrease in $F(q)$). This holds, likewise, for a variation in the agent's market wage W. A decrease in W increases both the necessary rent and the inefficiency. That being said, there is one interesting difference between the two employment agreements. Suppose that the respective condition for the first best (7) is *just* not satisfied. By construction, the resulting loss in efficiency is then still small. More formally, the first-order effect from $q^* < q_0$ is zero when we start from the efficient outcome. On the other hand, the first-order effect from an increase in the agent's rent is always strictly positive. To be more precise, we could consider, for instance, an increase in effort c, starting from the value at which, ceteris paribus, the first-best condition is just satisfied. Then, for small enough variations, we can unambiguously say that the at-will contract dominates.

Proposition 3 *The two types of employment agreements, as characterized in Propositions 1 and 2 compare as follows. When the firm can realize the maximum feasible profits as (7) holds, then this is possible under either employment regime. Otherwise, the firm faces a trade-off between leaving the agent with a rent under employment protection ($R > 0$) or facing inefficient decisions under a contract at-will ($L > 0$). Employment protection is always strictly better (with $L > R$) when the decision is sufficiently important as Δ*

is sufficiently large. On the other hand, the employment will always be at-will when the resulting distortions remain sufficiently small, as then the first-order effect from a higher rent dominates the respective effect from second-best decision making.

Proof. The comparison when the first best is feasible follows from the discussion in the main text. This holds also for the comparative analysis in Δ. Finally, for the case with small distortions, I consider a marginal change starting from parameter values at which condition (7) holds with equality. The analysis holds irrespective of the respective change in parameters (i.e., an increase in c or q_0, a decrease in $F(q)$ in the sense of FOSD, or a decrease in W). I consider thus only a marginal increase in c. Then, we have from the characterization in Proposition 2 that $dL/dc = 0$, given that we undertake the analysis at $q^* = q_0$. Instead, from Proposition 1 we have

$$\frac{dR}{dc} = \frac{c}{\int_{q_0}^{1} (q - q_0) f(q) dq} > 0.$$

Q.E.D.

6 Gradual Employment Protection.

The empirical literature that I discussed in the Introduction considers more gradual variations in employment protection (for senior executives and CEOs), such as the duration of an employment agreement. The longer is the stipulated duration, the higher is the penalty that the firm incurs when it dismisses an employee, given that it must compensate the agent for the foregone compensation. Another possibility would be the use of severance pay.

In what follows, I do not want to elaborate on the specificities of a particular way how an employee is protected from the threat of dismissal. Therefore, I simply stipulate that the firm incurs a penalty P, which accrues to the employee, when it fires the employee. The resulting extension of the analysis, where now $P \geq 0$ constitutes an additional choice variable, is straightforward, given our so far derived results.

The key difference is now that renegotiations at $t = 3$ will leave the agent at least with a compensation worth $W + P$. This is thus also what the agent can realize even when shirking. Consequently, the agent now realizes a rent that is exactly equal to P. This is costly for the firm, so that $P > 0$ is optimally chosen only if it has benefits. These benefits arise from more efficient decision making (provided that the first best is not feasible with $P = 0$, as condition (7) holds). Through setting $P > 0$ while increasing the bonus $b > 0$, the firm ensures that the employee's incentives not to shirk remain intact, while the cutoff q^* is pushed up. (Note that $w = 0$ holds in this case.) Provided that the respective program is quasiconcave (cf. the proof of Proposition 4), it is immediate to extend the insights from Proposition 3 as follows.

Proposition 4 *Suppose that the firm can grant employment protection more gradually, namely through a "penalty" $P \geq 0$ that it pays in case of a dismissal (e.g., through a longer agreed contract duration). Then, the optimal value of P, which is also the agent's rent, is higher when the decision is more important as Δ is higher. Further, provided that the first best is not feasible as (7) does not hold, even under the optimal value of P the agent's decision is still inefficient ($L > 0$ as $q^* < q_0$.)*

Proof. With $P \geq 0$, the cutoff q^* is determined by

$$q^* = \frac{M + P}{b}, \tag{19}$$

while it is equally straightforward to extend the incentive constraint (11) to obtain

$$\int_{q^*}^{1} [w(q) - W - P] f(q) dq \geq c. \tag{20}$$

After substituting from (19) into the binding constraint (20), we still have that b is determined by (16). As $P > 0$ will only be chosen when condition (7) does not hold, so that optimally $w = 0$, we have in analogy to expression (17) that q^* solves

$$(W + P) \int_{q^*}^{1} \left[\frac{q}{q^*} - 1 \right] f(q) dq = c. \tag{21}$$

Finally, substituting the binding constraint (20) into firm profits Π, expression (13) extends to

$$\Pi = \int_{q^*}^{1} \omega(q) f(q) dq + F(q^*) \omega(q_0) - (W + P + c) \tag{22}$$

I now differentiate Π with respect to P while using dq^*/dP from implicit differentiation of (21). This yields the first-order condition $\frac{d\Pi}{dP} = 0$:

$$f(q^*) \Delta (q_0 - q^*) \frac{q^*}{W + P} \frac{\int_{q^*}^{1} (q - q^*) f(q) dq}{\int_{q^*}^{1} q f(q) dq} = 1. \tag{23}$$

Note first that this implies that $q^* < q_0$, provided that this holds also for $P = 0$ as condition (7) does not hold. Further, note that, for given P, q^* is independent of Δ. When the objective function is strictly quasiconcave, we can thus see from implicit differentiation of the first-order condition (23) that $dP/d\Delta > 0$, implying also that $dq^*/d\Delta > 0$. **Q.E.D.**

7 Concluding Remarks

This paper is motivated by recent empirical findings that document that, at least in some jurisdictions, employees further up a firm's hierarchy may not only enjoy higher pay, but also more protection against dismissal. In my model, I combine two tasks that an agent may perform: He has to exert effort, as in a standard model of moral hazard, and he has to exert discretion when making a decision in the firm's interest.

My key comparative analysis is with respect to the importance of this decision, in terms of gained or lost profits that a better or worse decision generates for the firm. In the baseline analysis I compare two different forms of employment agreements. One agreement protects the agent against dismissal and, thereby, against the employer's attempts to renegotiate down his compensation in the future under the threat of dismissal. Instead, under an "at-will" agreement, no such protection is given to the agent. The key trade-off between these two arrangements is as follows. A contract at-will provides "cheaper" incentives for the agent to work hard. Specifically, I show that the agent then never receives a rent above his market wage. Such a rent may, however, be paid under a contract that offers employment protection. With such protection, the incentives to work hard must arise exclusively from the incentive component of the agent's compensation. Instead, incentives to work hard are provided from the threat of dismissal if the contract is at-will.

A contract at-will, while being "cheaper" at first glance, has the drawback of leading to less efficient decisions. Ultimately, the agent is then induced to make opportunistic decisions that make him less dispensable for the firm, thereby protecting him against dismissal or, likewise, against a lower (renegotiated) compensation in the future. In other words, the agent then substitutes for formal employment protection by creating "self-made" protection through making it more costly for the firm to replace him. I identify conditions when the losses in inefficiency are more important than the gains due to a lower compensation. In particular, this is the case when, as noted above, the decision is more important. Then, the respective employee both receives a rent and additional employment protection.

My model is very stylized so as to isolate the trade-off between rent extraction and efficiency in the simplest possible way. For this purpose, I have also abstracted from risk aversion, for instance. As discussed above, there may be various ways how a firm can offer employment protection more gradually, for instance through the length of a stipulated contract duration. Again, I have only offered a first, stylized analysis of this. Future work may add more structure to the model, so as to derive in more detail the *jointly* optimal components of efficient employment agreements, rather than focusing only on (incentive) pay.

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