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# Labor-Market Conditions and Leadership Styles

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## ABSTRACT

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# Labor-Market Conditions and Leadership Styles\*

Why do some leaders use praise as a means to motivate workers, while other leaders use social punishment? This paper develops a simple economic model to examine how leadership styles depend on the prevailing labor-market conditions for workers. We show that the existence of a binding wage floor for workers (e.g., due to trade union wage bargaining, minimum-wage legislation, or limited-liability protection) can make it attractive for firms to hire a leader who makes use of social punishment. While the use of social punishments generally is socially inefficient, it lessens the need for high bonus pay, which allows the firm to extract rents from the worker. In contrast, firms hire leaders who provide praise to workers only if it is socially efficient to do so. Credible use of leadership styles requires either repeated interaction or a leader with the right social preferences. Only moderately altruistic leaders offer praise, whereas only moderately spiteful leaders employ social punishment. Lastly, we show that when the leaders' and workers' reservation utilities give rise to a bigger income gap between leaders and workers, attracting spiteful leaders becomes relatively less costly and unfriendly leadership becomes more prevalent.

**JEL Classification:** D2, J3, M5

**Keywords:** leadership styles, incentives, motivation, social preferences, labor-market conditions, wage-setting

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# 1 Introduction

Leaders differ widely in the styles they adopt to motivate their workers. Some leaders use styles that, simultaneously, motivate workers as well as increase workers’ job satisfaction. Think for instance of leaders who provide praise from time to time in a thoughtful manner. This likely makes workers feel better motivated and more satisfied with their job at the same time (see, e.g., Artz et al. 2020). However, evidence abounds that not all leaders act in this “friendly” way. Some leaders try to keep workers motivated by harassing poor performers, hoping that this will impress the workforce at large and keep them from slacking. Clearly, the use of such “unfriendly” leadership styles will decrease rather than increase workers’ well-being on the job.<sup>1</sup>

This paper is concerned with the question of how firms choose their leaders and consequently leadership styles and, in particular, how this choice is affected by the labor-market conditions workers face. We compare firms that employ workers hired in a competitive labor market with firms that face a binding wage floor when hiring workers. Such a wage floor may arise for a variety of reasons including trade union wage bargaining, minimum-wage legislation, downward wage rigidity, and limited-liability protection.

We find that the presence of a wage floor has major consequences for the use of leadership styles that involve unfriendly leadership actions. While such actions are never used when workers are hired in a competitive labor market, they are sometimes used in the presence of a wage floor, and the more so the worse the workers’ labor market prospects are. The intuition is that in competitive labor markets, firms need to compensate workers for all of the costs imposed on them, including the harm from exposure to unfriendly leadership actions. When firms can also motivate workers using incentive pay, they will never motivate by unfriendly leadership actions, because it is always more costly to attain higher effort in the latter way than by increasing incentive pay. In contrast, when firms face a binding wage floor for their workers, they sometimes do adopt unfriendly leadership actions. The reason is that in such labor markets, workers earn a rent when staying with their current employer, and hence need not be compensated for the harm imposed on them. This can make unfriendly leadership actions an attractive alternative to incentive pay. The motivational use of friendly leadership actions is less responsive to the prevailing labor-market conditions for workers, because such actions

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<sup>1</sup>For example, the New York Times reports that Jeff Bezos has installed a “bruising” and “sometimes-punishing” workplace culture at Amazon and quotes a former employee saying that “Nearly every person I worked with, I saw cry at their desk” (Kantor and Streitfeld 2015). Similarly, Volkswagen’s culture under former CEO Martin Winterkorn is said to have been characterized by “fear and respect.” A former executive claimed that “If you presented bad news, those were the moments that it could become quite unpleasant and loud and quite demeaning” (Cremer and Bergin 2015). There is also widespread anecdotal evidence for an “angry-chef culture” in the restaurant industry (Lott-Lavigna 2018). Tepper et al. (2017) estimate that 10% of all employees suffer from abusive supervision, i.e., what Tepper (2000, p. 178) defines as “subordinates’ perceptions of the extent to which supervisors engage in the sustained display of hostile verbal and nonverbal behaviors, excluding physical contact.”

allow the firm to reduce incentive pay both in the presence and in the absence of a binding wage floor.<sup>2</sup>

In addition to this positive analysis yielding the predictions just described, we also perform a welfare analysis. We find that whenever motivation through friendly leadership actions is efficient from a social welfare perspective, the firm adopts a friendly leadership style. Using unfriendly leadership actions to motivate workers, on the other hand, is never socially efficient, and yet they are sometimes adopted when wage-setting is non-competitive. The reason for firms to adopt an inefficient leadership style is that it allows them to extract part of the rents that would otherwise end up in the hands of the workers.

Lastly, we study the credible use of leadership styles, which the firm has to ensure because the leader incurs costs from engaging in non-contractible leadership actions. We explore two ways in which a firm’s announcement of a leadership style may be credible: repeated interaction and hiring a leader with the “right” social preferences. Repeated interaction makes the adoption of leadership styles self-enforcing provided that the leader cares sufficiently about the future. Interestingly, while the self-enforcing condition for a motivational friendly leadership style is independent of labor-market conditions, the condition for a motivational unfriendly leadership style is not. The worse the worker’s labor market prospects, the larger the range of discount factors for which unfriendly leadership actions are self-enforcing. Moreover, unfriendly leadership actions may be self-enforcing when friendly leadership actions are not and vice versa.

If leaders do not care sufficiently about the future, credible implementation of leadership styles can be accomplished by hiring a leader with the “right” social preferences. Principals can choose between leaders with different social preferences, ranging from spiteful to altruistic.<sup>3</sup> We show that for praise to be a credible means to motivate the worker, a moderately altruistic leader is required. The intuition is that a leader who is too altruistic would always provide praise, independent of the worker’s performance. On the other hand, a leader who is not sufficiently altruistic would not live up to the promise of providing praise after good work performance. For social punishment to be a credible motivational device, a moderately spiteful leader is needed. A too spiteful leader would always punish, while a leader who is not spiteful enough would never punish. Interestingly, a selfish leader cannot commit to using any leadership style, at least not in a one-shot game. In addition to making a leadership style credible, leaders’ social preferences have further consequences for the costs of leadership. Among others, we show that worse labor market prospects of the worker relative to the leader make it

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<sup>2</sup>Relatedly, Clemens et al. (2018) have argued that a binding minimum wage may reduce fringe benefits provided by employers. We do not find such an effect for the friendly leadership style, because friendly leadership is a substitute for incentive pay in our framework, something which is absent in the model by Clemens et al. (2018).

<sup>3</sup>In modelling social preferences of leaders, we follow the same approach as in Rotemberg and Saloner (1993)’s seminar leadership paper, except that we also allow for spite (i.e., negative altruism).

more costly to employ an altruistic leader and less costly to employ a spiteful leader, rendering the use of unfriendly leadership styles more attractive for the firm.

The key insight of our paper is that firms may hire leaders that adopt unfriendly leadership actions when workers earn rents from staying with their current employer. Such rents can originate from trade union wage bargaining or minimum-wage legislation, but may also stem from other labor market policies such as employment protection legislation (EPL). Interestingly, Lepage-Saucier and Wasmer (2016) offer evidence that enhanced EPL can increase workers' stress and hence reduce their well-being. While this finding may seem paradoxical at first sight, it is well in line with the predictions of our model. As Lepage-Saucier and Wasmer (2016) argue, EPL may reduce the rate of job separations, resulting in firms opening fewer positions, which in turn entails longer periods of unemployment. As a consequence, workers' rents from staying with their current employer increase. According to our model, leaders may then use unfriendly leadership styles more often, which is likely to increase workers' stress.<sup>4</sup>

Our model can also be applied to jobs that are associated with high costs of failure where employees are typically protected by limited liability (e.g., C-level executives, doctors, or soldiers). Our model can accommodate such jobs by imposing a negative wage floor. According to Tepper (2007), leadership research on abusive supervision indicates that industries such as the military and health care, which are characterized by high work demands, risk, and high costs associated with failure are particularly susceptible to abusive leader behaviors. Our model suggests that this may be due to binding limited-liability constraints that prevent the implementation of effective monetary incentive schemes.

While leadership styles have received little attention in organizational economics (see the next section for a discussion of the literature), there exists a related literature on child labor and child soldiering, studying the role of violence and manipulation in resolving moral-hazard problems (Chwe 1990, Gates 2002, Beber and Blattman 2013). The theoretical study by Chwe (1990) is closest to ours. It shows that a principal may want to use "pain" in a principal-agent relationship when the agent is wealth constrained and the reservation utility of the agent is sufficiently bad.<sup>5</sup> Beber and Blattman (2013) add manipulation (in the form of intimidation, indoctrination, and misinformation) as

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<sup>4</sup>As alternative explanations for higher stress levels, Lepage-Saucier and Wasmer (2016) suggest that lower outside options exacerbate workers' fear of layoffs or prevent workers from quitting jobs that they dislike. In Appendix F of their paper they present a partial equilibrium model with a fixed outside option for workers in order to describe two additional mechanisms that could increase stress under EPL: First, as firing threats can no longer be used to motivate workers, employers may resort to increased monitoring to ensure high effort. Second, to induce low-productivity workers to quit, employers may combine more intensive monitoring with low-quality working conditions, which may also involve "unfriendly measures" such as psychological pressure or harassment. In contrast to our model, such measures are not used as an incentive device but as a selection device.

<sup>5</sup>Sherstyuk (2000) shows that a principal may want to use a costlessly available punishment threat associated with not meeting a standard if limited liability restricts the use of monetary fines.

an additional instrument at the disposal of the principal. Acemoglu and Wolitzky (2011) extend Chwe (1990)’s paper by allowing the principal to affect the agent’s outside option, giving rise to endogenous labor coercion. We differ from this literature in our focus on modern employment relationships and labor market institutions. Moreover, we take self-commitment issues of the firm into account and study repeated interaction and leaders’ social preferences as potential solutions.

The paper is structured as follows. In the next section, we discuss the related literature. Section 3 describes our model. In Section 4, we first analyze the firm’s problem of choosing an optimal leadership style when only a selfish leader is available. We allow for social preferences of the leader in Section 5. Finally, Section 6 concludes. All proofs are relegated to Appendix A. In Appendix B and C, we discuss two variants of our model.

## 2 Related literature

Our paper contributes to a small, but growing literature that uses formal modelling to analyze leadership. Indeed, economists have extensively analyzed how leaders (or principals) can induce workers (or agents) to exert the right level or type of effort, but the dominant approach is contractual: Incentive problems are solved by contracts and/or organizational design. The leadership literature, on the other hand, has focused much less on contracts, but concentrates on how leaders can (in economic terms) influence the beliefs and/or preferences of the workers (Zehnder et al. 2017). This literature typically evolves around the concepts of transformational and transactional leadership. While transactional leaders use performance-contingent actions to motivate their followers, transformational leaders inspire, persuade, and motivate their workers by articulating meaning, visions, and goals (see Bass 1990, House and Aditya 1997, and Robbins and Judge 2013).

In our model, the leader can take performance-contingent actions that praise good or punish bad performance. Depending on whether these actions have positive or negative effects on the worker’s well-being, we label the leader’s style as “friendly” or “unfriendly”. We thus study a firm’s optimal choice between transactional leadership styles, that fundamentally differ in their consequences for workers’ well-being.

This contrasts to the most common approach in the small economics leadership literature, that models aspects of transformational leadership. Dur et al. (2010) and Kvaløy and Schöttner (2015) consider models in which a manager’s ex ante motivational actions reduce the effort costs of the worker. Rotemberg and Saloner (1993, 1994, 2000) consider in a series of papers how vision and leadership style can affect incentive contracts and workers’ motivation. Van den Steen (2005) analyzes how managers with strong beliefs about the right course of action can attract workers with similar beliefs, while



Hermalin (2017) analyzes how charismatic leaders with superior information can make emotional appeals that induce both “emotional” workers and rational workers to work harder.<sup>6</sup> Akerlof and Kranton (2000, 2005), Dur (2009), and Non (2012) study how the leader can take actions that transform the worker’s identity or his altruism towards the leader.

In contrast to all these papers, we consider performance-contingent leadership actions. We thus extend the economic leadership literature by formulating a model that includes transactional leadership styles that go beyond the use of purely financial incentives. In this respect we are more in line with Besley and Ghatak (2008) who study a model where the principal can costlessly give a positional good in addition to a monetary bonus to well-performing agents.

Importantly, we also consider leadership actions that may be harmful for the worker. Moreover, a distinguishing feature of our paper is that we investigate how the choice of these different leadership instruments depends on the prevailing labor-market conditions for workers. As such, our paper focuses on a key difference between motivating through leadership and motivating through incentive contracts: Wage payments are frequently subject to exogenous constraints imposed by labor market regulation whereas firms are relatively free to choose a leadership style. We study whether firms may alleviate the consequences of wage constraints by adopting a leadership style that can exploit workers’ preferences for praise or social punishments.

Leadership scholars refer to styles that we label as “unfriendly” as destructive (Ferris et al. 2007), abusive (Tepper 2000), incivil (Pearson et al. 2000), or toxic (Lipman-Blumen 2004). The literature mainly treats these leadership styles as undesirable and inefficient. However, some papers also discuss how destructive leadership in some situations can promote organizational performance (Salin 2003 and Ferris et al. 2007), and recent studies suggest that anger expression may help leader effectiveness (e.g., Wang et al. 2018). This is also the case in our paper. Even if unfriendly leadership reduces the workers’ well-being, it sometimes improves the organization’s performance. In this sense, the form of unfriendly leadership we analyze is more associated with theory X leadership (McGregor 1960) and what is later termed directive leadership (see House 1971, and Pearce et al. 2003). This leadership style opens for threats, punishments, and contingent reprimands in order to promote high performance (Pearce et al. 2003).

Our paper is also related to principal-agent models of intrinsic motivation and social preferences, such as Bénabou and Tirole (2003, 2006), Besley and Ghatak (2005), Delfgaauw and Dur (2007, 2008)—see Besley and Ghatak (2018) and Cassar and Meier

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<sup>6</sup>Several other papers on the economics of leadership also emphasize the importance of information. In Hermalin (1998, 2007), Komai et al. (2007), Komai and Stegman (2010), Lazear (2012), and Bolton et al. (2013) the leader has followers because of superior skills or superior information about the right course of actions for the firm.

(2018) for recent surveys. Like these papers, we assume that workers obtain utility from work (or performances), but in contrast to their models, the non-monetary utilities in our model stem directly from costly leadership actions. However, we also allow the leader/principal to have social preferences, such as in Rotemberg and Saloner (1993), Prendergast and Stole (1996), Ellingson and Johannesson (2008), and Dur and Tichem (2015).

With respect to the (non-economic) leadership literature, our paper is related both to the literature on leadership emergence and leadership effectiveness. The literature on leadership emergence has mainly focused on the psychological traits of the individuals who emerge as leaders (see, e.g., Judge et al. 2002). We contribute to this literature by showing that economic and/or institutional conditions can determine the returns to and, hence, emergence of different leader personalities.

There seems to be a consensus in the literature that task and job characteristics are crucial for the effectiveness of different leadership styles (see Zehnder et al. 2017). Our model can potentially account for this by letting leadership costs or non-monetary utilities be a function of task or job characteristics. However, there is also evidence that similar firms use very different management practises and leadership styles (House et al. 2004, Bloom et al. 2012, Artz et al. 2020). In line with this, Liu et al. (2003) argue—in a conceptual model—that employment modes and contracting relationships may matter more for the choice of leadership style than task and job characteristics. Our paper supports this conjecture by developing a novel argument using a formal model. The same task or job could meet very different leadership styles. It is the wage-setting regime, and thus the nature of the labor market, rather than the nature of the task that determines optimal leadership style in our model.

Our model also challenges the prevailing (non-formal) theory on the relationship between leadership style and employee turnover. The standard hypothesis is that employees will want to quit their job if they are exposed to forms of unfriendly leadership, and hence that unfriendly—or destructive—leadership increases turnover (see Hyson 2016 for a recent overview). We show that this theoretical relationship is not so straightforward. It is exactly when turnover rates are low—or more precisely, when the outside options are bad and workers earn a rent—that one may see unfriendly leadership. Interestingly, the empirical relationship between destructive leadership and employee turnover is not so clear, indicating that the mechanism we describe in our model may balance the “wanting to quit” motives.

### 3 The model

A firm owner (principal) needs to hire a leader to run the firm. The leader in turn is required to hire a worker to perform a production task. The worker can choose between two effort levels, high and low. The worker's costs of high effort are  $c > 0$ , while low effort does not entail any effort costs. Effort is non-observable. The worker's output is verifiable and can be high or low, where expected output increases with effort. Specifically, when effort is low, output is always low.<sup>7</sup> When effort is high, output is high with probability  $\rho$ , where  $0 < \rho < 1$ . We assume that the principal always wants the worker to choose high effort, because the associated increase in expected output always exceeds the associated increase in the principal's wage costs. Thus, our focus is not on *whether*, but on *how* the worker will be motivated.

The worker can be motivated by monetary incentives and/or the leader's leadership actions. The monetary incentive consists of a bonus  $b$  paid to the worker when output is high. In addition to a possible bonus, the worker earns a base salary  $w$ . The leader can undertake leadership actions after observing the worker's output. On the one hand, the leader can take friendly leadership actions, e.g., praise the worker, which generates a non-monetary reward  $r > 0$  for the worker. On the other hand, a leader can also be unfriendly, e.g., scold or engage in social punishment, which imposes a non-monetary disutility  $s > 0$  on the worker.

The leader incurs costs when she engages in leadership actions.<sup>8</sup> We interpret these costs as psychological costs from taking the action and/or opportunity costs of time. The costs depend on the type of action undertaken and on the worker's output. Praising the worker is less costly for the leader when output is high than when it is low. For instance, it is easier to provide authentic praise if the worker accomplished something praiseworthy (producing high output). Likewise, scolding the worker is assumed less costly for the leader when output is low than when output is high. Quite naturally, it is easier to scold or shame someone when there is something to complain about (producing low output). Accordingly,

$$k_F^l \geq k_F^h > 0, \quad k_U^h \geq k_U^l > 0,$$

where  $k_F^l$  ( $k_F^h$ ) denotes the leader's costs of praising the worker if output is low (high) and  $k_U^h$  ( $k_U^l$ ) denotes the leader's costs of scolding the worker if output is high (low). In practice, the provision of the type of non-monetary rewards or punishments that we have in mind are typically not expressed in explicit contracts. Like the worker's effort, the leader's actions are commonly non-verifiable. We thus make the assumption that

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<sup>7</sup>Introducing a strictly positive probability of a high output when effort is low would not qualitatively change our results.

<sup>8</sup>In Appendix B, we discuss how our results are affected when we drop this assumption.

the leader's actions cannot be contracted upon.

We define leadership styles based on the leadership actions undertaken by the leader conditional on the worker's output. The following leadership styles are available:<sup>9</sup>

- Conditional friendly leadership (Style  $F$ ): The leader praises if output is high but does not take a leadership action if output is low.
- Unconditional friendly leadership (Style  $FF$ ): The leader always praises the worker irrespective of the output.
- Conditional unfriendly leadership (Style  $U$ ): The leader scolds the worker if output is low but does not take a leadership action if output is high.
- Unconditional unfriendly leadership (Style  $UU$ ): The leader always scolds the worker irrespective of the output.
- Carrot-and-stick leadership (Style  $FU$ ): The leader praises the worker if output is high and scolds the worker if output is low.

As we will show later, whether the implementation of a leadership style is credible or not may depend on the leader's social preferences towards the worker. Following Rotemberg and Saloner (1993), we assume that the leader's utility is given by

$$(1 - \theta) \cdot (\text{leader's net payoff}) + \theta \cdot (\text{worker's net payoff}),$$

where  $\theta \in [\underline{\theta}, \bar{\theta}]$  denotes the leader's type with  $0 \leq \bar{\theta} \leq 1/2$  and  $\underline{\theta} \leq 0$ . Type  $\theta = 0$  corresponds to a selfish leader, who only cares about her own payoff. If  $\theta > 0$  ( $\theta < 0$ ), the leader is altruistic (spiteful) towards the worker.<sup>10</sup>

The worker is risk neutral and his reservation utility is  $\underline{u} \geq 0$ . He has no social preferences concerning the leader and hence maximizes his expected net payoff. The worker's earnings must always be at least equal to a wage floor denoted by  $\underline{w}$ . The wage floor is exogenous and originates from, e.g., trade-union bargaining, minimum-wage legislation, or limited-liability protection. The absence of any exogenous wage restriction can be represented by  $\underline{w} = -\infty$  in our model. The relative size of  $\underline{u}$  and  $\underline{w}$  will determine the labor-market conditions for the worker, i.e., whether wage-setting for the worker is competitive or non-competitive. We provide the exact definitions regarding the wage-setting environment in Section 4.1.

<sup>9</sup>Given the assumptions we make, these are all the leadership styles that might be optimally chosen. Others (such as only scold when output is high and only praise when output is low) are dominated both from the principal's and the leader's perspective.

<sup>10</sup>Rotemberg and Saloner (1993) restrict attention to  $\theta \geq 0$  and call a leader with  $\theta > 0$  "empathetic." Andreoni and Miller (2002) provide empirical evidence using incentivized experiments showing that, while a majority of people can be characterized as altruistic, a substantial minority is spiteful.

The leader is also risk neutral and has reservation utility  $\underline{u}_l$ .<sup>11</sup> She receives a fixed wage  $w_l$ .<sup>12</sup> We assume that the leader's reservation utility  $\underline{u}_l$  is so high that the wage floor is never binding for the leader. This assumption allows us to focus on how worker's labor-market conditions and rents affect leadership styles.

Because the principal is assumed to be always willing to induce high effort, the principal's objective is to minimize total expected wages paid to the leader and the worker to induce high effort. We assume that engaging in non-monetary leadership actions is never sufficient to induce high effort; i.e., the worker will always receive a strictly positive bonus.<sup>13</sup> As will become clear later on, this assumption amounts to  $r + s < c/\rho$ .

The timeline is as follows.

1. Principal chooses a leader type  $\theta$ .
2. Principal announces a leadership style and offers the leader a wage  $w_l$ . The principal further stipulates the contract  $(w, b)$  for the worker.
3. Leader accepts or rejects. If the leader rejects, the game ends and the parties obtain their reservation utilities. If the leader accepts, the game proceeds.
4. Leader offers contract  $(w, b)$  to the worker. The worker observes the leader's type.
5. Worker accepts or rejects the contract. If the worker rejects, the game ends and the parties obtain their reservation utilities. If the worker accepts, the game proceeds.
6. Worker chooses effort and output is realized.
7. Leader chooses leadership action.
8. Leader and worker are paid.

We first want to focus our analysis on the relative benefits of the leadership styles under different labor-market conditions for the worker, while neglecting the impact of the leader's social preferences. Therefore, in Section 4, we restrict attention to a situation

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<sup>11</sup>Note that the reservation utility is assumed to be independent of the leader's type. This may reflect a situation where the leader's outside option is self-employment or unemployment (in the period under consideration), which may give each type the same utility. Note also that this assumption implies that the leader's social preferences (altruism or spite) towards the worker only exist when the leader is employed by the principal, not in the leader's outside option.

<sup>12</sup>In addition to the fixed wage, the leader could obtain a bonus contingent on the worker's output. However, a bonus for the leader is redundant because the leader takes her actions after output has been realized, so that a bonus does not affect the leader's incentives to undertake leadership actions but only her decision whether or not to work for the principal. The leader's participation, however, can be ensured by paying a fixed wage only.

<sup>13</sup>In Appendix C, we analyze a variant of our model where the worker cannot be incentivized by a bonus because his output is non-verifiable, and worker rents arise because of exogenous firm-specific characteristics.

where, at stage 1, the principal can only hire a selfish leader, i.e.,  $\underline{\theta} = \bar{\theta} = 0$ . In a one-shot interaction, a selfish leader never wants to undertake leadership actions, because imposing a (dis)utility on the worker is costly and does not yield any benefit to the leader. In the first part of Section 4, we abstract from this commitment problem, assuming that the leader will adopt the principal's announced leadership style. In Section 4.6, we show that the leader can credibly commit to profitable leadership styles in a multi-period setting when the leader's discount factor is sufficiently high and the leader has sufficient wealth to buy the firm. In Section 5, we examine how the existence of social preferences affects the self-enforcement properties of the different leadership styles as well as the principal's decisions which type of leader to hire and what style to implement.

## 4 Optimal leadership styles when the leader is selfish

In this section, we present the solution to our model for the case where the principal can hire only a selfish leader, i.e.,  $\underline{\theta} = \bar{\theta} = 0$ . We first assume that, given that the leader has accepted the principal's contract offer, she will adopt the leadership style that the principal has announced. As a benchmark, we first describe the situation where the worker is motivated by monetary incentives only. In Sections 4.2, 4.3, and 4.4 we investigate whether or not, relative to the benchmark, the principal benefits from complementing monetary incentives with a friendly, unfriendly, or the carrot-and-stick leadership style, respectively. In Section 4.5, we determine the overall optimal leadership style. Finally, in Section 4.6, we drop the assumption that the leader simply follows the principal's announced style and characterize the circumstances in which our previous results continue to hold in a multi-period setting.

### 4.1 Benchmark: Pure monetary incentives

When the leader does not undertake any leadership actions, the setting corresponds to a standard moral-hazard problem with binary outcome, binary effort, and a wage floor (e.g., Laffont and Martimort 2002). The worker chooses high effort when his expected utility from doing so is equal to or exceeds the expected utility attained when exerting low effort; that is, if:

$$w + \rho b - c \geq w \Leftrightarrow b \geq c/\rho.$$

In order to attract and retain the worker, the expected utility from accepting and keeping the job must be equal to or exceed the worker's reservation utility:

$$w + \rho b - c \geq \underline{u} \Leftrightarrow w \geq \underline{u} - \rho b + c.$$

In addition, the worker's base salary cannot be below the wage floor  $\underline{w}$ :

$$w \geq \underline{w}.$$

Hence, the principal minimizes the worker's expected wage by choosing the lowest bonus that triggers high effort and the lowest base salary that satisfies the exogenous wage constraint and ensures the participation of the worker:

$$b^* = c/\rho \text{ and } w^* = \max\{\underline{u}, \underline{w}\}.$$

If the wage floor  $\underline{w}$  is sufficiently low so that the respective constraint is not binding, i.e.,  $\underline{w} \leq \underline{u}$ , we speak of *competitive wage-setting*. This is the case in the absence of exogenous wage restrictions (i.e.,  $\underline{w} = -\infty$ ), but also if wage restrictions have no bite as the worker's outside option is sufficiently attractive. By contrast, if  $\underline{w} > \underline{u}$ , the wage constraint is binding and we refer to this situation as *non-competitive wage-setting*.<sup>14</sup>

The principal optimally sets the leader's wage  $w_l$  equal to the leader's reservation utility,  $\underline{u}_l$ . Hence, under pure monetary incentives for the worker, the principal's total costs, which we denote by  $C_0$ , are:

$$C_0 = w^* + \rho b^* + \underline{u}_l = c + \max\{\underline{u}, \underline{w}\} + \underline{u}_l.$$

With competitive wage-setting, the principal exactly compensates the worker for his cost of effort as well as for missing out on his outside opportunities. Under non-competitive wage-setting, the principal's costs increase by the rent he has to leave to the worker,  $\underline{w} - \underline{u}$ .

## 4.2 Friendly leadership

### 4.2.1 Leadership style $F$

Suppose the leader adopts the friendly leadership style  $F$ , which entails a non-monetary reward  $r$  to the worker conditional on high output at cost  $k_F^h$  to the leader. The worker exerts high effort if:

$$w + \rho(b + r) - c \geq w \Leftrightarrow b \geq (c/\rho) - r.$$

The worker accepts the job if:

$$w + \rho(b + r) - c \geq \underline{u}.$$

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<sup>14</sup>If we introduce a strictly positive probability of a high output when effort is low,  $\alpha \in (0, 1)$ , we obtain  $w^* = \{\underline{u} - \alpha(c/\rho), \underline{w}\}$ . Hence, non-competitive wage-setting can also occur for negative wage floors, which arise in jobs where a limited-liability constraint applies, as discussed in the Introduction.

In addition, the worker's base salary needs to satisfy  $w \geq \underline{w}$ . It follows that the optimal bonus and the optimal base salary amount to:

$$b_F^* = (c/\rho) - r \quad \text{and} \quad w_F^* = w^* = \max\{\underline{u}, \underline{w}\},$$

respectively. Accordingly, adoption of style  $F$  allows the principal to reduce the worker's bonus by  $r$ , whereas the worker's base salary does not change relative to the benchmark case of pure monetary incentives. The leader's expected payment now equals  $\rho k_F^h + \underline{u}_l$  because the leader needs to be compensated for her expected costs of undertaking a friendly leadership action. The principal's total costs under style  $F$  thus are:

$$C_F = w_F^* + \rho b_F^* + \rho k_F^h + \underline{u}_l = c - \rho(r - k_F^h) + \max\{\underline{u}, \underline{w}\} + \underline{u}_l.$$

Comparing  $C_F$  and the principal's costs in the benchmark case,  $C_0$ , it follows that the principal's costs are reduced by adopting style  $F$  if:

$$k_F^h < r, \tag{F}$$

that is, when the worker's utility gain from receiving praise exceeds the leader's costs of giving praise when output is high. The worker's expected utility remains unaffected by style  $F$  because the expected gain from praise equals the expected loss in bonus compensation. Hence, style  $F$  is not employed to reduce the worker's rent in the case of non-competitive wage-setting.

We now ask the question whether the principal's choice is socially optimal. The adoption of a leadership style is socially optimal if it increases the total surplus generated within the employment relationship. We thus need to compare the leader's costs of adopting style  $F$  with the ensued utility for the worker. We have seen that the leadership style also affects wages, but changes in wages leave the total surplus unaffected because they merely constitute a transfer from the principal to the worker or the leader. The friendly style  $F$  increases the worker's expected utility by  $\rho r$ , whereas the leader incurs expected costs  $\rho k_F^h$ . It hence is socially optimal to adopt this style if  $r > k_F^h$ , which is in accordance with condition (F).

Lemma 1 summarizes the results for the friendly leadership style  $F$ .

**Lemma 1** *Independent of labor-market conditions characterized by  $\underline{u}$  and  $\underline{w}$ , the principal prefers style  $F$  to pure monetary incentives if adopting the style is socially optimal, i.e., the worker's benefit exceeds the leader's costs so that condition (F) holds. The worker's rent remains unaffected under style  $F$  relative to a situation with pure monetary incentives.*



#### 4.2.2 Leadership style $FF$

Instead of only being friendly and providing praise in case of high output, the leader could always be friendly, i.e., adopt style  $FF$ . As unconditional leadership actions do not provide the worker with effort incentives, the bonus eliciting high effort under style  $FF$  is the same as under pure monetary incentives. However, relative to the benchmark, the principal can reduce the base salary by  $r$  as long as doing so does not violate the wage-floor constraint. Consequently, the optimal bonus and base salary now is:

$$b^{FF} = b^* = c/\rho \quad \text{and} \quad w_{FF}^* = \max\{\underline{u} - r, \underline{w}\},$$

respectively. The principal's total costs become:

$$C_{FF} = w_{FF}^* + \rho b^* + \rho k_F^h + (1 - \rho)k_F^l + \underline{u}_l = c + \max\{\underline{u} - r, \underline{w}\} + \rho k_F^h + (1 - \rho)k_F^l + \underline{u}_l.$$

When we compare these costs with the costs under pure monetary incentives,  $C_0$ , we can immediately see that always being friendly is not worthwhile for the principal under non-competitive wage-setting, i.e., if  $\underline{w} > \underline{u}$ . Because the principal cannot lower the worker's base salary in this case, always being friendly only leads to additional costs for the leader. It is straightforward to verify that style  $FF$  is profitable under competitive wage-setting, i.e.,  $C_{FF} < C_0$ , if and only if:

$$\rho k_F^h + (1 - \rho)k_F^l < \min\{r, \underline{u} - \underline{w}\}. \quad (FF)$$

The left-hand side of this condition corresponds to the leader's expected costs for which the principal needs to compensate the leader, whereas the right-hand side describes the decrease in the worker's base salary. Due to wage-setting restrictions, adoption of style  $FF$  can reduce the worker's base salary by at most  $\underline{u} - \underline{w}$ , which hence constitutes an upper bound on the principal's benefit from creating extra utility  $r$  for the worker. Thus, the higher the worker's outside option relative to the wage floor, the greater the region among the other parameters for which leadership style  $FF$  dominates the benchmark.

Adoption of style  $FF$  strictly increases the worker's utility if the worker's gain from the leader's friendliness exceeds the decrease in the base salary, i.e., if  $\underline{u} - r < \underline{w}$  or, equivalently,  $\underline{u} - \underline{w} < r$ . If  $r \leq \underline{u} - \underline{w}$ , the worker is equally well off under pure monetary incentives and style  $FF$ . Adoption of style  $FF$  is socially efficient when the worker's associated gain exceeds the leader's expected costs, i.e.,  $\rho k_F^h + (1 - \rho)k_F^l < r$ . The principal hence makes a socially inefficient decision when the latter condition is met but the worker's rent,  $\underline{u} - \underline{w}$ , is lower than the leader's costs. Lemma 2 summarizes the results for style  $FF$ .

**Lemma 2** *The principal prefers style FF to pure monetary incentives if and only if condition (FF) holds, which is possible only under competitive wage-setting. The worker's utility weakly increases when style FF is adopted relative to pure monetary incentives. The principal refrains from adopting style FF even though adopting the style would be socially efficient if and only if  $\underline{u} - \underline{w} \leq \rho k_F^h + (1 - \rho)k_F^l < r$ .*

### 4.3 Unfriendly leadership

#### 4.3.1 Leadership style U

Under style  $U$ , the leader incurs a cost  $k_U^l$  to impose a social penalty on the worker after observing low output, implying a non-monetary cost of  $s$  for the worker. The worker exerts high effort if:

$$w + \rho b - (1 - \rho)s - c \geq w - s \Leftrightarrow b \geq (c/\rho) - s.$$

The worker accepts the job if:

$$w + \rho b - (1 - \rho)s - c \geq \underline{u}.$$

In addition, the worker's base salary cannot be below  $\underline{w}$ . We obtain for the optimal bonus and for the optimal base salary:

$$b_U^* = (c/\rho) - s \text{ and } w_U^* = \max\{\underline{u} + s, \underline{w}\},$$

respectively. Accordingly, relative to the benchmark of pure monetary incentives, style  $U$  allows the principal to lower the bonus by amount  $s$ . However, the principal might also need to increase the base salary to compensate the worker for the expected cost of the social penalty. This is always the case if style  $U$  is implemented under competitive wage-setting (i.e.,  $\underline{w} \leq \underline{u}$ ). The base salary needed to attract the worker must then increase by amount  $s$ . This exactly compensates the worker for the reduction in the expected bonus compensation (which amounts to  $\rho s$ ) and the expected costs of the social penalty (which equals  $(1 - \rho)s$ ). By contrast, if style  $U$  is implemented under non-competitive wage-setting (i.e.,  $\underline{w} > \underline{u}$ ), the principal only has to increase the base salary if  $s$  is so large that it exceeds the worker's rent, i.e.,  $s > \underline{w} - \underline{u}$ , in which case the base salary has to be raised by  $s - (\underline{w} - \underline{u})$ .

The adoption of unfriendly leadership thus entails an advantageous incentive effect (the bonus can be lowered) as well as a detrimental participation effect (the base salary has to be raised). The latter effect is less pronounced or may even disappear under non-competitive wage-setting because a worker who earns a rent within an employment relationship will not always be instantly driven away by the social disutility of unfriendly

leadership.

The principal's total costs under style  $U$  are:

$$C_U = w_U^* + \rho b_U^* + (1 - \rho)k_U^l + \underline{u} = \max\{\underline{u} + s, \underline{w}\} + c - \rho s + (1 - \rho)k_U^l + \underline{u}.$$

Hence, comparing  $C_0$  and  $C_U$ , it follows that when the worker is hired under competitive wage-setting, implementing the unfriendly leadership style increases costs by  $(1 - \rho)(k_U^l + s)$ , and thus is never a good idea. Even though style  $U$  motivates the worker, it does so by inflicting harm to the worker, for which the principal needs to offer compensation in order to satisfy the participation constraint. The bonus is a better instrument because it motivates and brings an additional benefit to the worker, a benefit that the principal can recoup by reducing the base salary.

However, if the worker is hired under non-competitive wage-setting and hence earns a rent when no leadership style is used, the principal does not need to fully compensate the worker for the harm inflicted by unfriendly leadership. Comparing  $C_0$  and  $C_U$  for the case  $\underline{w} > \underline{u}$ , the principal prefers style  $U$  to the benchmark under the following condition:

$$(1 - \rho)k_U^l + \max\{s - (\underline{w} - \underline{u}), 0\} < \rho s, \quad (U)$$

i.e., if the reduction in expected bonus pay,  $\rho s$ , exceeds the expected leadership costs,  $(1 - \rho)k_U^l$ , plus the increase in the worker's base salary, given by  $\max\{s - (\underline{w} - \underline{u}), 0\}$ . If the expected bonus reduction exceeds the expected leadership costs, then style  $U$  dominates the pure monetary incentives for a greater region among the other parameters the bigger the difference between the wage floor  $\underline{w}$  and the value of the worker's outside option  $\underline{u}$ . This implies that a worker is more likely to be subject to style  $U$  if he is locked in the current employment relationship because his labor market prospects are relatively unattractive.

The more the penalty harms the worker (the larger  $s$ ), the more strongly the bonus can be decreased. However, if  $s$  becomes too large, the participation effect may dominate, reflected by the second term on the left-hand side of (U). The principal then has to compensate the worker for unfriendly leadership by a rather high base salary so that this leadership style is not profitable. As  $\rho$  approaches one, implying that output is very responsive to effort, the leader always prefers style  $U$  over no leadership. If the worker is very likely to produce a high output, it is very unlikely that the leader has to be unfriendly and incur the respective costs, whereas the principal benefits most from the bonus reduction.

Style  $U$  is never socially desirable because—besides the transfer of income between the parties, which does not impact social welfare—it entails an expected utility loss of  $(1 - \rho)s$  for the worker and expected leadership costs of  $(1 - \rho)k_U^l$  for the leader. However,

as we have seen, the principal may nevertheless adopt this style under non-competitive wage-setting in order to extract rents from the worker.

The following lemma summarizes our findings regarding style  $U$ .

**Lemma 3** *The principal prefers style  $U$  to pure monetary incentives if and only if condition (U) holds. Accordingly, style  $U$  is implemented only under non-competitive wage-setting and only if the worker's labor market prospects are sufficiently unattractive (i.e., the rent  $\underline{w} - \underline{u}$  is large). Style  $U$  lowers the worker's rent relative to pure monetary incentives and is socially inefficient.*

#### 4.3.2 Leadership style $UU$

Under style  $UU$ , the leader scolds the worker independent of the realized output. The style imposes a disutility on the worker and costs on the leader without affecting the bonus needed to elicit high effort. Therefore, style  $UU$  is dominated by pure monetary incentives.<sup>15</sup> Clearly, adoption of style  $UU$  would also be socially inefficient.

#### 4.4 Carrot-and-stick leadership

Under carrot-and-stick leadership, style  $FU$ , the leader praises the worker if output is high and scolds the worker if output is low. The style hence corresponds to the simultaneous adoption of style  $F$  and style  $U$ . Using the analysis in Section 4.2.1 and Section 4.3.1, it is straightforward to show that the optimal bonus and the optimal base salary is:

$$b_{FU}^* = c/\rho - s - r \quad \text{and} \quad w_{FU}^* = w_U^*,$$

respectively. Accordingly, relative to the benchmark, the principal can lower the worker's bonus by  $s + r$  but may have to adjust the base salary to compensate the worker for enduring the leader's unfriendliness in case of low output. Hence, the principal incurs the following costs under style  $FU$ :

$$C_{FU} = \max\{\underline{u} + s, \underline{w}\} + c - \rho(s + r) + \rho k_F^h + (1 - \rho)k_U^l + \underline{u}_l.$$

To understand when the principal prefers style  $FU$  to the benchmark, suppose that style  $U$  dominates the benchmark case, i.e., condition (U) holds. Then, adopting style  $F$  in addition to style  $U$  is beneficial if and only if (F) holds. Similarly, suppose that style  $F$  dominates the benchmark case, i.e., condition (F) holds. Then, adopting style  $U$  in addition to style  $F$  is beneficial if and only if (U) holds. Thus, overall, style  $FU$  dominates the benchmark (as well as style  $U$  and style  $F$ ) if and only if both conditions

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<sup>15</sup>We nevertheless include the style here as it may be used once we allow for leader's social preferences, as we shall see in Section 5.

( $F$ ) and ( $U$ ) hold at the same time. It follows that the principal adopts style  $FU$  only under non-competitive wage-setting. Analogous to style  $U$ , style  $FU$  lowers the worker's utility and is socially inefficient.

**Lemma 4** *The principal prefers style  $FU$  to pure monetary incentives if and only if both conditions ( $F$ ) and ( $U$ ) hold, which is possible only under non-competitive wage-setting. Adoption of style  $FU$  lowers the worker's rent relative to pure monetary incentives and is socially inefficient.*

## 4.5 Optimal choice between leadership styles

### 4.5.1 Competitive wage-setting

We now turn to the principal's optimal choice between different leadership styles and first consider competitive wage-setting, i.e., the case where  $\underline{u} \geq \underline{w}$ . The previous analysis has shown that only the friendly styles  $F$  and  $FF$  can dominate pure monetary incentives in this case. We obtain the following result.

**Proposition 1** *Suppose that wage-setting is competitive, i.e.,  $\underline{u} \geq \underline{w}$ . If  $r \leq k_F^h$ , the worker is motivated by pure monetary incentives. If  $r > k_F^h$ , the principal implements a friendly leadership style. Style  $FF$  is optimal if*

$$(1 - \rho)k_F^l < \min\{r, \underline{u} - \underline{w}\} - \rho r$$

*holds. Otherwise, style  $F$  is optimal.*

Proposition 1 shows that when there is no wage floor ( $\underline{w} = -\infty$ ) or the wage floor is sufficiently low, the principal implements style  $FF$  provided that the leader's costs of being friendly are not prohibitively high in case of low output, i.e.,  $k_F^l < r$ , whereas the principal implements style  $F$  if  $k_F^h < r \leq k_F^l$ . If none of these conditions hold (i.e.,  $r \leq k_F^h$ ), the principal refrains from implementing any friendly style. In that case, the worker simply does not appreciate praise enough to make up for the costs of the leader to provide praise. If the wage floor is close to the worker's outside option, the wage constraint may affect the implemented leadership style. The existence of a wage floor may make it optimal for the principal to announce style  $F$  even if  $k_F^l < r$ . This happens when the principal cannot fully capture the worker's utility gain from receiving praise unconditionally without violating the wage constraint. Hence, we find that, at least for some range, the higher the worker's outside option relative to the wage floor, the greater the region among the other parameters for which leadership style  $FF$  dominates.

#### 4.5.2 Non-competitive wage-setting

When wage-setting is non-competitive, i.e.,  $\underline{w} > \underline{u}$ , the previous analysis implies that style  $F$ , style  $U$ , and style  $FU$  are candidates for the overall optimal leadership style. It will turn out that the following condition on the worker's rent in the benchmark case, given by  $\underline{w} - \underline{u}$ , is crucial for the optimal choice of the leadership style:

$$(1 - \rho)(s + k_U^l) < \underline{w} - \underline{u} \quad (U')$$

The following proposition characterizes the principal's optimal choice of a leadership style under non-competitive wage-setting.

**Proposition 2** *Suppose that wage-setting is non-competitive,  $\underline{w} > \underline{u}$ .*

- (i) *Suppose that  $\frac{k_F^h}{r} \geq 1$  and  $\frac{k_U^l}{s} \geq \frac{\rho}{1-\rho}$ . Then pure monetary incentives dominate the adoption of a leadership style.*
- (ii) *Suppose that  $\frac{k_F^h}{r} < 1$ . If  $\frac{k_U^l}{s} < \frac{\rho}{1-\rho}$  and condition  $(U')$  holds, the principal implements style  $FU$ . Otherwise, the principal implements style  $F$ .*
- (iii) *Suppose that neither case (i) nor case (ii) applies. If condition  $(U')$  holds, the principal implements style  $U$ . Otherwise, the principal implements pure monetary incentives.*

Figure 1 illustrates the findings presented in Proposition 2. From the above analysis, in particular conditions  $(F)$  and  $(U)$ , it follows that, compared to the benchmark of pure monetary incentives, style  $F$  is profitable if and only if  $k_F^h/r < 1$ , whereas a necessary condition for style  $U$  to be profitable is that  $k_U^l/s < \rho/(1 - \rho)$ . Hence, in case (i) of Proposition 2, both leadership styles as well as their combination, the carrot-and-stick style  $FU$ , are too costly relative to their benefits and the worker should be motivated only through monetary incentives.

Case (ii) of the proposition describes a situation in which style  $F$  always dominates pure monetary incentives. Combining style  $F$  and  $U$ , i.e., adopting style  $FU$ , becomes optimal when the cost-benefit ratio of style  $U$  is also sufficiently low and the worker's rent  $\underline{w} - \underline{u}$  is sufficiently high.

Finally, case (iii) characterizes the optimal leadership style when style  $F$  is dominated by pure monetary incentives, but style  $U$  has a sufficiently small cost-benefit ratio, i.e.,  $\frac{k_U^l}{s} < \frac{\rho}{1-\rho}$ . Now style  $U$  will be the only profitable leadership style provided that the worker's rent is sufficiently high. Case (iii) in particular implies that, even if styles  $F$  and  $U$  are equally costly to implement (i.e.,  $k_F^h = k_U^l$ ) and equally effective at reducing the worker's bonus (i.e.,  $r = s$ ), style  $U$  can be the only profitable leadership style. Such a situation arises when  $1 \leq k_F^h/r = k_U^l/s < \frac{\rho}{1-\rho}$  and  $(U')$  holds. A necessary

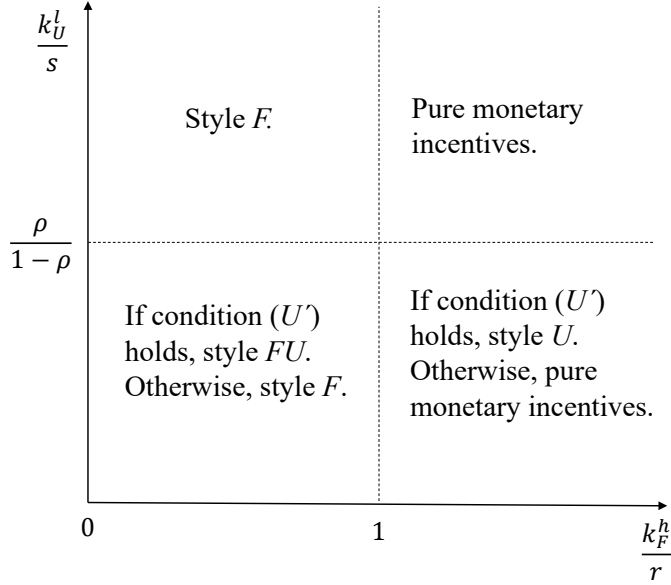


Figure 1: Optimal leadership styles under non-competitive wage-setting

condition for such a situation to arise is that high output is more likely than low output (i.e.,  $\rho > 1/2$ ). Style  $U$  then has the comparative advantage that leadership costs arise relatively infrequently because the worker is likely to be successful.

Overall, the results presented in Proposition 2 lead to a clear prediction regarding the adoption of non-monetary leadership actions under non-competitive wage-setting: The worse the worker's labor market prospects, i.e., the higher  $\underline{w} - \underline{u}$ , the greater the region among the other parameters for which the principal wants the leader to engage in unfriendly actions after observing low output. Moreover, comparing Proposition 1 and 2, the prediction follows that non-competitive wage-setting makes it more likely that a leadership style that involves unfriendly actions in response to low output is adopted.

#### 4.6 Self-enforcing leadership in repeated interactions

The previous analysis has abstracted from the leader's problem to commit to adopting a given leadership style. We now address this issue by integrating long-term reputational concerns of the leader in our analysis. For simplicity, we assume that, at stage 0, the principal can sell the firm to the leader and extract all future leader rents. We thus assume that there are leaders with sufficient wealth to buy the firm. This assumption implies that our previous three-tier hierarchy can be simplified to a two-tier hierarchy with a leader and a worker, where the leader wants to minimize the costs of incentivizing the worker. This simplification is the easiest way to induce reputational concerns on the

side of leader.

We assume that the leader needs to hire a worker for an infinite number of periods and has a discount factor  $\delta \in (0, 1)$ . Workers live for one period only and are then replaced by a new worker, who learns the history of the game. This assumption again simplifies the analysis as we exclude the threat of dismissal as an incentive device (Shapiro and Stiglitz 1984). Alternatively, we can assume that firing workers is prohibitively costly. We restrict attention to stationary contracts where the leader offers the same contract to each worker. When the leader offers a contract, she can also announce a leadership style. The worker believes that the leader will implement the announced style if she has also complied with her announcement in the past. If the leader reneges on the announcement, the worker believes that she will never again implement a leadership style. When, after output has been realized, the leader finds it in her best interest to comply with her announcement of a leadership style, we say that the leadership style is self-enforcing.

We first address the question when—given that implementing a given leadership style is worthwhile relative to the benchmark with pure monetary incentives—the leadership style is also self-enforcing. First consider the conditional friendly leadership style  $F$ , and assume it is beneficial compared to the benchmark, i.e., condition  $(F)$  holds and hence  $k_F^h < r$ . Style  $F$  is self-enforcing if:

$$k_F^h \leq \sum_{t=1}^{\infty} \delta^t (C_0 - C_F) \quad \Leftrightarrow \quad k_F^h \leq \frac{\delta}{1 - \delta} \rho (r - k_F^h). \quad (1)$$

The condition reflects that the leader will comply with her announcement when her short-term gain from non-compliance,  $k_F^h$ , does not exceed her long-term loss, the term on the right-hand side. If the leader deviates from her announcement, the worker cannot be motivated by leadership anymore. Hence, the leader can only use monetary incentives to induce high effort, implying that expected per-period wage costs increase by  $C_0 - C_F$ .

Next consider unconditional friendly leadership, style  $FF$ , and assume it dominates the benchmark of pure monetary incentives, i.e., condition  $(FF)$  holds. Style  $FF$  is self-enforcing if the leader finds it beneficial to undertake the friendly action even if output is low (recall that  $k_F^l \geq k_F^h$ ):

$$k_F^l \leq \sum_{t=1}^{\infty} \delta^t (C_0 - C_{FF}) \quad \Leftrightarrow \quad k_F^l \leq \frac{\delta}{1 - \delta} (\min\{r, \underline{u} - \underline{w}\} - \rho k_F^h - (1 - \rho) k_F^l). \quad (2)$$

Condition (1) shows that, whether style  $F$  is self-enforcing or not is independent of labor-market conditions as characterized by  $\underline{u}$  and  $\underline{w}$ . By contrast, unconditional friendliness, style  $FF$ , is self-enforcing for (weakly) lower  $\delta$  when  $\underline{u} - \underline{w}$  increases, i.e., if the worker's labor market prospects become more attractive. The leader can then save more wage costs by always being friendly.



Now consider conditional unfriendly leadership, style  $U$ , and assume that this style is beneficial relative to no leadership, i.e., condition  $(U)$  holds. Unfriendly leadership is self-enforcing if:

$$k_U^l \leq \sum_{t=1}^{\infty} \delta^t (C_0 - C_U). \quad (3)$$

Inspection of  $C_0$  and  $C_U$  shows that the difference between the two wage-cost functions depends on whether  $\underline{w} > \underline{u} + s$  holds or not. First assume that  $\underline{w} > \underline{u} + s$ . Condition (3) then becomes:

$$k_U^l \leq \frac{\delta}{1-\delta} [\rho s - (1-\rho)k_U^l]. \quad (4)$$

If  $\underline{w} \leq \underline{u} + s$ , condition (3) is equivalent to:

$$k_U^l \leq \frac{\delta}{1-\delta} [\underline{w} - \underline{u} - (1-\rho)(k_U^l + s)]. \quad (5)$$

Finally, consider the carrot-and-stick style  $FU$  and assume both  $(F)$  and  $(U)$  hold, so that the style dominates pure monetary incentives. The style is self-enforcing if:

$$\begin{aligned} \max\{k_F^h, k_U^l\} &\leq \sum_{t=1}^{\infty} \delta^t (C_0 - C_{FU}) \\ \Leftrightarrow \max\{k_F^h, k_U^l\} &\leq \frac{\delta}{1-\delta} (\min\{\underline{w} - \underline{u} - s, 0\} + \rho(s+r) - \rho k_F^h - (1-\rho)k_U^l). \end{aligned} \quad (6)$$

The conditions (4), (5), and (6) indicate that a leadership style that involves unfriendly actions becomes self-enforcing for lower values of  $\delta$  when  $\underline{w} - \underline{u}$  increases, i.e., the worker's labor market prospects deteriorate.

Overall, from conditions (1)–(6) it follows that, if a leadership style dominates pure monetary incentives, the leadership style will be self-enforcing for sufficiently high discount factors or, in other words, when the leader sufficiently cares about future wage costs. This observation brings us to our next proposition.

**Proposition 3** *Suppose that the leader owns the firm and interacts repeatedly with workers in the manner described above. Suppose that a leadership style  $LS \in \{FF, F, U, FU\}$  dominates pure monetary incentives. Then there is a threshold  $\underline{\delta}^{LS} \in (0, 1)$  such that the leadership style is self-enforcing for all discount factors  $\delta \geq \underline{\delta}^{LS}$ .*

Hence, our previous results on the optimal leadership style stated in Proposition 1 hold for all  $\delta \geq \max\{\underline{\delta}_F, \underline{\delta}_{FF}\}$ , whereas the results stated in Proposition 2 hold for all  $\delta \geq \max\{\underline{\delta}_F, \underline{\delta}_U, \underline{\delta}_{FU}\}$ .

## 5 Optimal leadership styles when the leader has social preferences

We now incorporate social preferences of the leader in our analysis and return to a single-period setting. However, in contrast to the single-period setting studied in Section 4, we no longer assume that the leader simply follows the principal's announced leadership style. Our analysis proceeds in three steps. In Section 5.1, we examine how the principal can ensure self-enforcement of a given leadership style by hiring a leader from a certain range of leader types. In Section 5.2, we derive the principal's total costs of implementing a given leadership style, taking into account that different leader types demand different wages. Finally, in Section 5.3, we characterize the principal's optimal choice of leadership style.

### 5.1 Social preferences and self-enforcement of leadership styles

After the worker's output has been observed, the leader can freely choose between three actions: she can praise the worker, scold the worker, or refrain from undertaking any leadership actions. The leader will engage in a leadership action if doing so strictly increases her utility, which is the case if the following condition holds:

$$-(1 - \theta)(\text{cost of leadership action}) + \theta(\text{utility of leadership action for the worker}) > 0.$$

Accordingly, because engaging in leadership actions is costly, the leader may praise the worker only if she is altruistic towards the worker (i.e.,  $\theta > 0$ ). Moreover, because the leader values her own net payoff more than the worker's utility (i.e.,  $\theta \leq 1/2$ ), for the leader to praise it is necessary that her costs do not exceed the worker's benefit from praise,  $r$ . Also, an altruistic leader will never scold the worker. The leader will scold the worker only if she is spiteful so that reducing the worker's utility pleases the leader (i.e.,  $\theta < 0$ ) and, moreover, the worker's associated utility loss,  $s$ , exceeds the leader's costs. Spiteful leaders never praise.

More precisely, assuming that  $r \geq k_F^l$  and  $s > k_U^h$  and defining thresholds such that

$$\underline{\theta}_{UU} := -\frac{k_U^h}{s - k_U^h}, \quad \underline{\theta}_U := -\frac{k_U^l}{s - k_U^l}, \quad \underline{\theta}_F := \frac{k_F^h}{r + k_F^h}, \quad \underline{\theta}_{FF} := \frac{k_F^l}{r + k_F^l},$$

we obtain the following relationship between the leader's type  $\theta$  and her leadership actions: A very altruistic leader of type  $\theta > \underline{\theta}_{FF}$  always praises the worker regardless of his output. A leader of type  $\theta = \underline{\theta}_{FF}$  praises the worker if output is high but is indifferent between praising and not praising the worker if output is low. A moderately altruistic leader with  $\theta \in (\underline{\theta}_F, \underline{\theta}_{FF})$  will praise the worker if and only if output is high.

A leader of type  $\theta = \underline{\theta}_F$  is indifferent between praising and not praising the worker if output is high and will not undertake a leadership action in case of low output.

Very spiteful leaders with  $\theta < \underline{\theta}_{UU}$  always scold the worker, whereas moderately spiteful leaders of type  $\theta \in (\underline{\theta}_{UU}, \underline{\theta}_U)$  scold the worker if and only if output is low. A leader of type  $\theta = \underline{\theta}_{UU}$  scolds when output is low but is indifferent between scolding and not scolding the worker if output is high. A leader of type  $\theta = \underline{\theta}_U$  is indifferent between scolding and not scolding the worker if output is low and will not engage in a leadership action in case of high output.

Leaders with relatively weak social preferences (i.e.,  $\theta \in (\underline{\theta}_U, \underline{\theta}_F)$ ) neither praise nor scold regardless of the worker's output. Note that this range of leader types includes the selfish leader studied in the previous section.

We assume that, if the leader is indifferent between different leadership actions and one of these actions is in line with the style that the principal announced at stage 2, the leader will comply with the principal's announcement. In addition, we make the following assumption.

**Assumption 1** *We assume that  $s > k_U^h$  and  $\underline{\theta} \leq \underline{\theta}_{UU}$ , implying that there exist leader types that scold the worker irrespective of output. Furthermore, we assume that  $r \geq k_F^l$  and  $\bar{\theta} = 1/2$ , implying that there are leader types that praise the worker irrespective of output.*

We thus obtain the following result on the self-enforcement of leadership styles in one-period employment relationships.

**Lemma 5** *Suppose that Assumption 1 holds. The principal can ensure self-enforcement of ...*

- (i) ... style  $FF$  by hiring a very altruistic leader of type  $\theta \geq \underline{\theta}_{FF}$ .
- (ii) ... style  $F$  by hiring a moderately altruistic leader of type  $\theta \in [\underline{\theta}_F, \underline{\theta}_{FF}]$ .
- (iii) ... style  $U$  by hiring a moderately spiteful leader of type  $\theta \in [\underline{\theta}_{UU}, \underline{\theta}_U]$ .
- (iv) ... style  $UU$  by hiring a very spiteful leader of type  $\theta \leq \underline{\theta}_{UU}$ .

*Leadership style  $FU$  is never self-enforcing. Pure monetary incentives are self-enforcing when the leader has relatively weak social preferences, i.e.,  $\theta \in [\underline{\theta}_U, \underline{\theta}_F]$ .*

Lemma 5 shows that, if the principal wants to implement a given leadership style besides style  $FU$ , he can ensure that this leadership style is self-enforcing by hiring from a certain range of leader types. In particular, if the costs of leadership actions depend on the realized output, i.e.,  $k_F^h < k_F^l$ ,  $k_U^l < k_U^h$  and consequently  $\underline{\theta}_F < \underline{\theta}_{FF}$ ,  $\underline{\theta}_{UU} < \underline{\theta}_U$ , then

a range of moderately altruistic and moderately spiteful leader types will adopt style  $F$  and style  $U$ , respectively. No leader type will adopt the carrot-and-stick leadership style  $FU$ , i.e., praise the worker if output is high and scold the worker if output is low because it needs an altruistic leader to praise but a spiteful leader to scold.<sup>16</sup>

## 5.2 The principal's costs for a given leadership style

The analysis in the previous subsection has shown that the principal may hire from a range of leader types to make a given leadership style self-enforcing. As different leader types may request different wages for adopting the same leadership style, we now discuss what type of leader the principal should hire to minimize total wage costs for a given leadership style  $LS$ , where  $LS \in \{FF, F, U, UU, 0\}$ . Here, 0 stands for our benchmark case where the worker is motivated by monetary incentives only. As the carrot-and-stick style  $FU$  is never self-enforcing according to Lemma 5, we henceforth neglect this style.

We now fix a style  $LS \in \{FF, F, U, UU, 0\}$  and consider a leader of type  $\theta$  who will engage in this style, as described in Lemma 5. Defining  $u_l^{LS}$  as the leader's wage net of leadership costs and  $u_w^{LS}$  as the worker's expected utility under the style, the leader will accept the contract if and only if her expected utility is at least as high as her reservation utility,

$$(1 - \theta)u_l^{LS} + \theta u_w^{LS} \geq \underline{u}_l \quad \Leftrightarrow \quad u_l^{LS} \geq \frac{\underline{u}_l - \theta u_w^{LS}}{1 - \theta}. \quad (\text{PC-L})$$

The term  $u_w^{LS}$  is composed of the worker's expected utility from the leadership actions, his cost of effort, and his expected compensation under style  $LS$ . When the leader is altruistic, she receives extra utility when the worker earns more, allowing the principal to reduce the leader's wage. However, to satisfy the leader's participation constraint, increasing the worker's wage is (weakly) dominated by giving the money directly to the leader because  $\theta \leq 1/2$ . When the leader is spiteful, she would prefer the worker to earn less, which is however not possible without violating the worker's incentive compatibility constraint, wage floor constraint, or participation constraint. Hence,  $u_w^{LS}$  follows from our analysis in Section 4, and the leader's optimal wage is such that (PC-L) binds. The optimal leader type,  $\theta_{LS}^*$ , thus minimizes the term on the right-hand side of (PC-L), subject to the restriction that the type engages in style  $LS$ .

The following lemma shows that the optimal leader type crucially depends on how the leader's labor markets prospects, characterized by her reservation utility  $\underline{u}_l$ , compare to the worker's labor-market conditions, characterized by  $\underline{u}$  and  $\underline{w}$ .

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<sup>16</sup>Slightly extending our model, the principal could implement style  $FU$  by hiring two leaders, a moderately spiteful one and a moderately altruistic one. We exclude this case from our analysis by assuming that hiring two leaders is prohibitively costly, i.e.,  $\underline{u}_l$  is too large.

**Lemma 6** *Suppose that Assumption 1 holds. In order to ensure that a given leadership style  $LS \in \{FF, F, U, UU, 0\}$  is self-enforcing and to minimize total wage costs for the style, the principal hires the following leader type  $\theta_{LS}^*$ :*

$$\begin{aligned}\theta_{FF}^* &= \begin{cases} \underline{\theta}_{FF} & \text{if } \underline{u}_l \geq \max\{\underline{u}, \underline{w} + r\} \\ \bar{\theta} & \text{otherwise} \end{cases} \\ \theta_F^* &= \begin{cases} \underline{\theta}_F & \text{if } \underline{u}_l \geq \max\{\underline{u}, \underline{w}\} \\ \underline{\theta}_{FF} & \text{otherwise} \end{cases} \\ \theta_0^* &= \begin{cases} \underline{\theta}_U & \text{if } \underline{u}_l \geq \max\{\underline{u}, \underline{w}\} \\ \underline{\theta}_F & \text{otherwise} \end{cases} \\ \theta_U^* &= \begin{cases} \underline{\theta}_{UU} & \text{if } \underline{u}_l \geq \max\{\underline{u}, \underline{w} - s\} \\ \underline{\theta}_U & \text{otherwise} \end{cases} \\ \theta_{UU}^* &= \begin{cases} \underline{\theta} & \text{if } \underline{u}_l \geq \max\{\underline{u}, \underline{w} - s\} \\ \underline{\theta}_{UU} & \text{otherwise} \end{cases}\end{aligned}$$

The principal's wage costs for style  $LS$ , denoted by  $\hat{C}_{LS}$ , are:

$$\begin{aligned}\hat{C}_{FF} &= c + \max\{\underline{u} - r, \underline{w}\} + \left[ \rho k_F^h + (1 - \rho)k_F^l + \frac{1}{1 - \theta_{FF}^*}(\underline{u}_l - \theta_{FF}^* \max\{\underline{u}, \underline{w} + r\}) \right] \\ \hat{C}_F &= c + \max\{\underline{u}, \underline{w}\} - \rho r + \left[ \rho k_F^h + \frac{1}{1 - \theta_F^*}(\underline{u}_l - \theta_F^* \max\{\underline{u}, \underline{w}\}) \right] \\ \hat{C}_0 &= c + \max\{\underline{u}, \underline{w}\} + \left[ \frac{1}{1 - \theta_0^*}(\underline{u}_l - \theta_0^* \max\{\underline{u}, \underline{w}\}) \right] \\ \hat{C}_U &= c + \max\{\underline{u} + s, \underline{w}\} - \rho s + \left[ (1 - \rho)k_U^l + \frac{1}{1 - \theta_U^*}(\underline{u}_l - \theta_U^* \max\{\underline{u}, \underline{w} - s\}) \right] \\ \hat{C}_{UU} &= c + \max\{\underline{u} + s, \underline{w}\} + \left[ \rho k_U^h + (1 - \rho)k_U^l + \frac{1}{1 - \theta_{UU}^*}(\underline{u}_l - \theta_{UU}^* \max\{\underline{u}, \underline{w} - s\}) \right]\end{aligned}$$

Inspecting the principal's total costs for leadership style  $LS$ , given by  $\hat{C}_{LS}$ , the respective term in square brackets corresponds to the leader's wage. Accordingly, the leader is compensated for her expected costs of undertaking leadership actions and receives an additional payment that depends on her type, her reservation utility, and the worker's expected utility in the employment relationship,  $u_w^{LS}$ , which is given by the maximum operator. We refer to this additional payment as the *leader's wage net of leadership costs*. The principal hires the leader type that minimizes this payment.

Regarding the optimal leader type, two different cases occur. In the first case, the leader's reservation utility and hence also her expected utility when she works for the principal is at least as high as the worker's expected utility,  $\underline{u}_l \geq u_w^{LS}$ . In this situation, according to Lemma 6, the principal hires the lowest type  $\theta$  that is still willing to engage

in the given style  $LS$ .<sup>17</sup> The reason is that inequality which is advantageous for the leader is valued more by more spiteful leaders and disliked less by less altruistic leaders. Consequently, lower types request lower wages. This relationship further implies that the principal prefers a leader with social preferences even if the worker's incentives are purely monetary. The principal then hires the most spiteful leader that still refrains from scolding the worker when output is low (i.e.,  $\theta_0^* = \theta_U$ ).

In the second case, the worker's utility exceeds the leader's reservation utility,  $\underline{u}_l < u_w^{LS}$ . Such a situation can arise when the worker possesses general human capital that is in high demand on the labor market, but workers with such skills are scarce. For example, a researcher in an R&D department may have better outside options than the department leader, which implies that  $\underline{u}_l < u_w^{LS}$ . The principal then hires the least spiteful or most altruistic type that will adopt a given style. In particular, to implement the benchmark case with pure monetary incentives for the worker, the principal hires the most altruistic type that still refrains from praising the worker when output is high (i.e.,  $\theta_0^* = \theta_F$ ).

Overall, these results imply that the principal faces a trade-off between ensuring self-enforcement of a given leadership style and minimizing the leader's wage net of leadership costs. On the one hand, if leaders are better off than workers, the most spiteful leader type,  $\theta = \underline{\theta}$ , enjoys this situation most and therefore requires the lowest wage net of leadership costs. However, this type will always adopt style  $UU$ . If the principal wishes to induce a different style, he has to hire a less spiteful leader and pay her a higher wage net of leadership costs. On the other hand, if the worker is better off than the leader, the most altruistic leader type,  $\theta = \bar{\theta}$ , feels most comfortable with this type of inequality and thus accepts the lowest wage net of leadership costs, but will always adopt style  $FF$ . Adopting less friendly styles that allow to lower the worker's bonus then require to hire a different type of leader and pay her a higher wage net of leadership costs.

### 5.3 Optimal choice between leadership styles

We now describe the principal's optimal choice of the leadership style or, equivalently, the leader's type. Our analysis in the foregoing section has shown that, when deciding what type of leader to hire and hence what leadership style to implement, the principal needs to optimally balance a trade-off between ensuring self-enforcement of a given leadership style and minimizing the leader's wage net of leadership costs. We will focus our analysis on how optimally balancing the trade-off is affected by labor market characteristics as described by the worker's reservation utility  $\underline{u}$ , the wage floor  $\underline{w}$ , and the leader's reservation utility  $\underline{u}_l$ . We denote the overall optimal leader type by  $\theta^*$ , from which the implemented leader type follows according to Lemma 5.

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<sup>17</sup>Only if  $\underline{u}_l = u_w^{LS}$ , the principal is indifferent between all leader types that implement the given style.

### 5.3.1 Competitive wage-setting

Under competitive wage-setting,  $\underline{w} \leq \underline{u}$ , the results presented in Lemma 6 provide us with the following total costs that the principal incurs to induce a given leadership style:

$$\begin{aligned}\hat{C}_{FF} &= c + \max\{\underline{u} - r, \underline{w}\} + \left[ \rho k_F^h + (1 - \rho)k_F^l + \frac{1}{1 - \theta_{FF}^*}(\underline{u}_l - \theta_{FF}^* \max\{\underline{u}, \underline{w} + r\}) \right], \\ \hat{C}_F &= c + \underline{u} - \rho r + \left[ \rho k_F^h + \frac{1}{1 - \theta_F^*}(\underline{u}_l - \theta_F^* \underline{u}) \right], \\ \hat{C}_0 &= c + \underline{u} + \left[ \frac{1}{1 - \theta_0^*}(\underline{u}_l - \theta_0^* \underline{u}) \right], \\ \hat{C}_U &= c + \underline{u} + s - \rho s + \left[ (1 - \rho)k_U^l + \frac{1}{1 - \theta_U^*}(\underline{u}_l - \theta_U^* \underline{u}) \right], \\ \hat{C}_{UU} &= c + \underline{u} + s + \left[ \rho k_U^h + (1 - \rho)k_U^l + \frac{1}{1 - \theta_{UU}^*}(\underline{u}_l - \theta_{UU}^* \underline{u}) \right].\end{aligned}$$

To simplify the exposition, let  $w_l^c(\theta) := \frac{1}{1-\theta}(\underline{u}_l - \theta \underline{u})$  denote the leader's wage net of leadership costs for  $LS \in \{UU, U, F, 0\}$  and, in case  $\underline{u} \geq \underline{w} + r$ , also for  $LS = FF$ .

We first focus on a situation where the worker has a lower reservation utility than the leader,  $\underline{u} \leq \underline{u}_l$ . In the special case where the leader and the worker have the same reservation utility,  $\underline{u} = \underline{u}_l$ , we obtain that the leader's wage net of leadership costs are independent of the leader's type,  $w_l^c(\theta) = \underline{u}_l$  for all  $\theta$  and for all  $LS \in \{UU, U, F, 0\}$  and, if  $\underline{u} \geq \underline{w} + r$ , also for  $LS = FF$ . In these situations, the principal's costs are thus identical to the case with a selfish leader,  $\hat{C}_{LS} = C_{LS}$ . Intuitively, as the leader's expected net payoff equals the worker's expected utility, the leader's social preferences do not affect the costs of hiring the leader. Only if  $\underline{u} < \underline{w} + r$  and thus the worker earns a rent under style  $FF$ , the principal minimizes costs for style  $FF$  by hiring an altruistic leader with  $\theta = \bar{\theta}$ . From our analysis in Section 4.3 it follows that, for competitive wage-setting with  $\underline{u} = \underline{u}_l$ , the unfriendly leadership styles  $U$  and  $UU$  are always dominated by pure monetary incentives. Moreover, from Proposition 1 and  $r \geq k_F^h$ , we obtain that hiring an altruistic leader who engages in friendly leadership leads to lower costs for the principal than using pure monetary incentives to motivate the worker. It is straightforward to verify that, given our assumptions that  $r \geq k_F^l$  and  $\bar{\theta} = 1/2$ , style  $FF$  dominates style  $F$  irrespective of whether  $\underline{u} \geq \underline{w} + r$  holds or not. Hence, when  $\underline{u} = \underline{u}_l$ , the principal minimizes her costs by hiring the most altruistic leader type,  $\theta^* = \bar{\theta}$ .

If, however,  $\underline{u} < \underline{u}_l$ , the leader's wage net of leadership costs,  $w_l^c(\theta)$ , is increasing in  $\theta$ , which makes hiring less spiteful or more altruistic leaders more costly relative to a situation where  $\underline{u} = \underline{u}_l$ . Therefore, to induce a given leadership style, the principal will hire the lowest leader type  $\theta$  who still engages in the style. In addition, observe that the less friendly or more unfriendly the style, the less steeply the principal's costs increase

in  $\underline{u}_l$ ,

$$\frac{\partial \hat{C}_{FF}}{\partial \underline{u}_l} > \frac{\partial \hat{C}_F}{\partial \underline{u}_l} > \frac{\partial \hat{C}_0}{\partial \underline{u}_l} > \frac{\partial \hat{C}_U}{\partial \underline{u}_l} > \frac{\partial \hat{C}_{UU}}{\partial \underline{u}_l} > 0. \quad (R_l)$$

It follows that, as  $\underline{u}_l$  increases starting from  $\underline{u}_l = \underline{u}$ , the principal will at some point decide to hire a less altruistic leader, i.e., switch from style  $FF$  to style  $F$ . As  $\underline{u}_l$  continues to increase, the principal will switch to pure monetary incentives, then to style  $U$ , and finally even to style  $UU$ . The reason is that spiteful leaders enjoy inequality that is advantageous for them and thus request lower wages net of leadership costs, so that style  $U$  and style  $UU$  become profitable when  $\underline{u}_l - \underline{u}$  is sufficiently high. The principal then finds it optimal to accept an unfriendly style even though the worker's expected compensation has to increase to reimburse the worker for enduring the unfriendly leader.

On the other hand, for changes in the worker's reservation utility, we obtain

$$0 \leq \frac{\partial \hat{C}_{FF}}{\partial \underline{u}} < \frac{\partial \hat{C}_F}{\partial \underline{u}} < \frac{\partial \hat{C}_0}{\partial \underline{u}} < \frac{\partial \hat{C}_U}{\partial \underline{u}} < \frac{\partial \hat{C}_{UU}}{\partial \underline{u}}. \quad (R_w)$$

Thus, if  $\underline{u}$  decreases starting from  $\underline{u} = \underline{u}_l$ , this also favors a switch from friendly leadership to pure monetary incentives and then to style  $U$  and style  $UU$ . However, as  $\underline{u} \geq \bar{w}$ , there is a lower bound on  $\underline{u}$  so that these switches do not necessarily occur at some point. The following proposition summarizes these results.

**Proposition 4** *Suppose that wage-setting is competitive and leaders have weakly better outside options than workers,  $\underline{w} \leq \underline{u} \leq \underline{u}_l$ , and Assumption 1 holds. If  $\underline{u} = \underline{u}_l$ , the principal will hire the most altruistic leader type,  $\theta^* = \bar{\theta}$ , who implements style  $FF$ . However, as  $\underline{u}_l$  increases or  $\underline{u}$  decreases, the overall optimal leader type  $\theta^*$  weakly decreases.*

Proposition 4 reveals another reason why workers with poor labor market prospects can be subject to unfriendly leadership. An environment where workers' reservation utilities are relatively low compared to those of leaders attracts spiteful leaders in the sense that they are willing to perform the job for lower wages, and these leader types will engage in unfriendly actions.

Now consider a situation where workers have higher reservation utilities than leaders,  $\underline{u} > \underline{u}_l$ . The leader's wage net of leadership costs,  $w_l^c(\theta)$ , is now decreasing in the leader's type because less spiteful or more altruistic leaders are more comfortable with a situation where workers are better off than themselves. We obtain the following result.

**Proposition 5** *Suppose that wage-setting is competitive and leaders have worse outside options than workers,  $\underline{w} \leq \underline{u}$  and  $\underline{u} > \underline{u}_l$ , and Assumption 1 holds. The principal always hires an altruistic leader of type  $\theta^* = \bar{\theta}$ , who implements style  $FF$ .*

Hence, workers in a competitive labor market who have better labor market prospects



than their leaders will always be subject to unconditional friendly leadership, implying that only monetary incentives are used to motivate these workers.

### 5.3.2 Non-competitive wage-setting

Under non-competitive wage-setting,  $\underline{w} > \underline{u}$ , by Lemma 6, we obtain for the principal's total cost under each leadership style:

$$\begin{aligned}\hat{C}_{FF} &= c + \underline{w} + \left[ \rho k_F^h + (1 - \rho)k_F^l + \frac{1}{1 - \theta_{FF}^*}(\underline{u}_l - \theta_{FF}^*(\underline{w} + r)) \right], \\ \hat{C}_F &= c + \underline{w} - \rho r + \left[ \rho k_F^h + \frac{1}{1 - \theta_F}(\underline{u}_l - \theta_F \underline{w}) \right], \\ \hat{C}_0 &= c + \underline{w} + \left[ \frac{1}{1 - \theta_U}(\underline{u}_l - \theta_U \underline{w}) \right], \\ \hat{C}_U &= c + \max\{\underline{u} + s, \underline{w}\} - \rho s + \left[ (1 - \rho)k_U^l + \frac{1}{1 - \theta_{UU}}(\underline{u}_l - \theta_{UU} \max\{\underline{u}, \underline{w} - s\}) \right], \\ \hat{C}_{UU} &= c + \max\{\underline{u} + s, \underline{w}\} + \left[ \rho k_U^h + (1 - \rho)k_U^l + \frac{1}{1 - \underline{\theta}}(\underline{u}_l - \underline{\theta} \max\{\underline{u}, \underline{w} - s\}) \right].\end{aligned}$$

When we neglect the leader's wage net of leadership costs for a moment or, equivalently, suppose that it is constant for all types, we can show that, given our Assumption 1, the principal minimizes his total costs by implementing either  $LS = U$  or  $LS = F$ , where the implementation of style  $U$  can be optimal only if  $\underline{w} - \underline{u}$  is sufficiently high.<sup>18</sup> Thus, the main insight from Proposition 2, that a high worker rent in the benchmark can lead to unfriendly leadership, carries over to a situation where style  $FU$  is not available.

To understand the impact of the leader's social preferences on the principal's total costs, recall that the wage floor constraint is never binding for the leader and hence  $\underline{u}_l \geq \underline{w}$ . The leader thus obtains a higher utility than the worker under all leadership styles besides, possibly, the unconditional friendly style  $FF$  where the worker's expected utility is  $\underline{w} + r$ . It thus follows from Lemma 6 that, under all styles besides, possibly, style  $FF$ , the principal minimizes wage costs by hiring the lowest type  $\theta$  that engages in this style. Moreover, the leader's wage net of leadership costs decreases from  $LS = F$  to  $LS = 0$ , from  $LS = 0$  to  $LS = U$ , and from  $LS = U$  to  $LS = UU$ . This particularly implies that, even though we focus on a situation where the worker's utility gain from being praised in case of high output exceeds the leader's associated costs,  $r \geq k_F^h$  (by Assumption 1), style  $F$  does not necessarily dominate pure monetary incentives because, net of leadership costs, hiring an altruistic leader is more expensive than hiring a spiteful leader. Moreover, besides potentially reducing the worker's expected compensation (compare Section 4.3.1), style  $U$  now has the additional comparative advantage that it allows the principal to hire a more spiteful leader,  $\theta = \underline{\theta}_{UU}$ , who earns a lower wage net of

<sup>18</sup>We provide a proof in Appendix A.

leadership costs than a less spiteful or altruistic leader that is needed for  $LS = 0$  or  $LS = F$ , respectively. If the most spiteful leader type,  $\theta = \underline{\theta}$ , accepts a sufficiently lower wage than type  $\theta = \underline{\theta}_{UU}$ , the principal will even prefer style  $UU$  to style  $U$ . In addition, style  $FF$  can also be profitable. Comparing the costs under style  $F$  and  $FF$ , we have  $\hat{C}_{FF} < \hat{C}_F$  if unconditional friendly leadership lowers the wage of type  $\theta = \theta_{FF}^*$  sufficiently strongly relative to type  $\theta = \theta_F$  due to the worker's higher utility under  $FF$  than under  $F$ .

In spite of the rich set of potentially optimal leadership styles, changes in the worker's and the leader's reservation utility have a clear-cut effect on the relative attractiveness of the leadership styles for the principal. If the worker's reservation utility increases, so do the principal's costs under the unfriendly styles when  $\underline{u} + s \geq \underline{w}$ . More specifically, we have

$$\frac{\partial \hat{C}_{UU}}{\partial \underline{u}} > \frac{\partial \hat{C}_U}{\partial \underline{u}} > 0 \quad \text{for } \underline{u} + s \geq \underline{w}.$$

Otherwise, the principal's costs are unaffected by changes in  $\underline{u}$ . Intuitively, if  $\underline{u} + s \geq \underline{w}$ , the analysis in Section 4.3.1 has shown that the principal has to (partially) compensate the worker for unfriendly leadership by raising his wage relative to  $LS = 0$ , and this wage raise needs to be higher when the worker's outside option improves. At the same time, hiring a spiteful leader becomes more costly as the worker's utility increases relative to the leader's payoff. Hence, the overall optimal leader type is weakly increasing in the worker's reservation utility. Moreover, the overall optimal leader type  $\theta^*$  is weakly decreasing in the leader's reservation utility as  $(R_l)$  continues to hold under non-competitive wage-setting. Intuitively, the higher the leader's reservation utility, the better off will be the leader relative to the worker, which makes hiring low leader types relatively less costly. The following proposition summarizes these findings.

**Proposition 6** *Suppose wage-setting is non-competitive,  $\underline{u} < \underline{w}$ , and Assumption 1 holds. The overall optimal leader type  $\theta^*$  is weakly decreasing in  $\underline{u}_l$  and weakly increasing in  $\underline{u}$ .*

We can thus conclude that the comparative statics with respect to the worker's reservation utility are identical to the setting where only a selfish leader is available, which we have discussed in Section 4.5.2: When workers have better outside options, the implementation of unfriendly leadership styles becomes relatively more costly for the principal so that the adoption of friendly styles becomes more likely. By contrast, when leaders have better outside options, the unfriendly styles become less costly to implement for the principal and hence occur for a greater region among the other parameters.

The impact of an increase of the wage floor on the optimal leadership style is somewhat more involved. Inspecting the principal's costs under pure monetary incentives as

well as the friendly leadership styles, we obtain

$$\frac{\partial \hat{C}_0}{\partial \underline{w}} > \frac{\partial \hat{C}_F}{\partial \underline{w}} > \frac{\partial \hat{C}_{FF}}{\partial \underline{w}} \geq 0,$$

i.e., a higher wage floor increases the principal's costs, but less so if he hires higher leader types. Intuitively, when the leader is altruistic, her wage can be lowered when the wage floor goes up, and the more so the more altruistic the leader. The impact of a higher  $\underline{w}$  on the costs of the unfriendly styles depends on whether or not  $\underline{u} + s > \underline{w}$  holds. If  $\underline{u} + s > \underline{w}$ , the principal's costs for the unfriendly styles,  $\hat{C}_U$  and  $\hat{C}_{UU}$ , are not affected by a marginal increase of the wage floor because, in this case, unfriendly leadership eliminates the worker's rent so that he earns his reservation utility. Overall, for the case  $\underline{u} + s > \underline{w}$  we obtain that

$$\frac{\partial \hat{C}_0}{\partial \underline{w}} > \frac{\partial \hat{C}_F}{\partial \underline{w}} > \frac{\partial \hat{C}_{FF}}{\partial \underline{w}} \geq 0 = \frac{\partial \hat{C}_U}{\partial \underline{w}} = \frac{\partial \hat{C}_{UU}}{\partial \underline{w}}.$$

By contrast, if  $\underline{u} + s \leq \underline{w}$ , a higher wage floor translates into a higher utility for the worker also under unfriendly leadership. A spiteful leader thus demands a higher wage and, the more spiteful the leader, the more strongly her wage needs to increase when the worker earns more. For  $\underline{u} + s \leq \underline{w}$ , we thus obtain that

$$\frac{\partial \hat{C}_{UU}}{\partial \underline{w}} > \frac{\partial \hat{C}_U}{\partial \underline{w}} > \frac{\partial \hat{C}_0}{\partial \underline{w}} > \frac{\partial \hat{C}_F}{\partial \underline{w}} > \frac{\partial \hat{C}_{FF}}{\partial \underline{w}} \geq 0,$$

which implies that the optimal leader type is weakly increasing in  $\underline{w}$ . These results are summarized in the following proposition.

**Proposition 7** *Suppose wage-setting is non-competitive,  $\underline{u} < \underline{w}$ , and Assumption 1 holds. If  $\underline{u} + s > \underline{w}$ , an increase of the wage floor makes the adoption of an unfriendly leadership style optimal for a greater region among the other parameters. By contrast, if  $\underline{u} + s \leq \underline{w}$ , the optimal leader type is weakly increasing in  $\underline{w}$ .*

Consequently, in contrast to the case where only a selfish leader is available, the impact of a wage-floor raise on the optimal leadership style is not clear-cut when leaders have social preferences. If the wage floor is relatively low (i.e.,  $\underline{u} + s > \underline{w}$ ), a higher wage floor makes the implementation of unfriendly leadership optimal for a greater region among the other parameters, as it is the case with a selfish leader (compare Section 4.5.2). If, however, the wage floor is sufficiently high (i.e.,  $\underline{u} + s \leq \underline{w}$ ) so that the worker's rent is not completely eliminated under unfriendly leadership, a higher wage floor promotes friendly leadership styles because hiring altruistic leaders becomes relatively less costly to hire.

## 6 Conclusion

This paper has developed a simple model so as to analyze optimal leadership styles under different labor-market conditions. We have examined two leadership actions differing in their non-monetary consequences for workers (positive or negative). We have seen that—when leaders have no social preferences—leadership styles that are harmful to workers are only applied when wage-setting is non-competitive. The reason is that, with competitive wage-setting, workers need to be compensated for any harm that the leader imposes on them, making incentive pay a superior instrument to motivate workers. However, when wage-setting is non-competitive, full compensation is not needed as workers earn a rent, implying that firms may use unfriendly leadership actions, despite them being socially inefficient. Unfriendly leadership in such markets enables the firm to extract rents from the worker. On the other hand, we have shown that a conditionally friendly leadership style that both motivates and benefits workers is applied whenever it is socially efficient, independent of the wage-setting conditions. The reason is that this style allows the firm to reduce incentive pay both in the presence and in the absence of a binding wage floor.

In our model, non-competitive wage-setting and worker rents arise or are exaggerated because the principal needs to provide the worker with monetary incentives, which become more costly in the presence of a wage floor. In Appendix C, we show that unfriendly leadership actions also become more prevalent when rents stem from other sources, e.g., firm-specific characteristics that make it attractive for the worker to be employed at the principal’s firm.

When leaders cannot credibly commit to a leadership style, hiring a leader with the “right” social preferences makes all leadership styles feasible except for the carrot-and-stick leadership style that uses both positive and negative leadership actions. Social preferences of leaders have further consequences for the wage costs of hiring the leader. Altruistic leaders suffer when the wage of the worker is relatively low, whereas spiteful leaders actually enjoy it when the wage for workers is lower. This provides a second reason for why worse labor market prospects of workers make it more likely that workers are exposed to unfriendly leadership styles.

In addition to concerns about social efficiency, the use of unfriendly leadership styles may also raise equity concerns. Our theory predicts that leadership styles involving unfriendly actions are more likely used when wage-setting is non-competitive, such as when a legal minimum wage binds or when trade unions have negotiated agreements that imply wage floors that, at the same time, lead to unemployment so that workers’ outside options are poor. Such arrangements are commonly more relevant in the bottom half of the income distribution. As a result, it might be that workers in this part of the income distribution are more likely to suffer from unfriendly leadership styles, exacerbating the inequality in well-being in society.

More generally, our model predicts a higher prevalence of friendly leadership styles in free-market economies. Interestingly, while markets the last 40 years have played an increasingly important role in managing and allocating resources in Western economies (in particular in the euro zone), we have also seen a trend from “hard” to “soft” leadership styles within firms and organizations. Autocratic leadership styles have been replaced by more democratic, inclusive, and relational leadership styles (Aviolo et al. 2009),<sup>19</sup> and there has been an increased focus on leaders’ and workers’ social competence (Deming, 2017). Although no causal relationships have been established, cross-country studies on leadership differences indicate a higher prevalence of softer and more inclusive leadership styles in individualistic, market-oriented societies (see, e.g., Boltanski and Chiapello 2007, Dorfman et al. 2007, and Lonati 2020). Although these styles are different from the styles we study, a mechanism similar to ours might be in place as the delegation of decision-making authority can be a motivation device (e.g., Aghion and Tirole 1997 and Fehr et al. 2013).

The opportunity to use leadership as a motivational tool may change policy implications. Take the recent discussion about bonus caps for, among others, bankers (see, e.g., Bénabou and Tirole 2016). A concern raised about bonus caps in policy discussions and in the literature is that it may diminish incentives to work hard. Our model predicts an additional concern, namely that the principal (e.g., the bankers’ boss) may start using unfriendly leadership to compensate for the restrictions put on the use of monetary incentives.

We hope that our analysis will give rise to further theoretical explorations as well as to empirical testing of our key predictions. Theoretically, it would be interesting to extend the model to a general-equilibrium setting, where unemployment arises in equilibrium due to, e.g., a legal minimum wage or trade-union involvement in wage-setting. Unfriendly leadership may in such a richer setting be less inefficient than in the partial equilibrium setting studied in this paper (or may even be constrained efficient), as it may mitigate other distortions. For instance, the distortionary effect of a legal minimum wage on unemployment may be lower when employers have the opportunity to use unfriendly leadership.

Empirically, it would be interesting to see whether there is a link between wage-setting institutions or firm-specific characteristics (as discussed in Appendix C) and styles of leadership, as reported by, e.g., employees in questionnaires. Similarly, as already mentioned in the Introduction, our model predicts that industries that exhibit high costs of failure may be more prone to use unfriendly leadership styles than industries

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<sup>19</sup>This overall trend towards a “softer,” more collaborative approach to leadership is also captured by developments in relational (Uhl-Bien 2006), responsible (Maak and Pless 2006), shared and distributed (Pearce et al. 2003), and collective leadership (Quick 2017). We thank Rune Todnem By for pointing us to these studies.

where costs of failure are low because negative wage floors may be binding only in the former case. Also, one could collect data on the social preferences of leaders (using questionnaire data or incentivized games, such as in Andreoni and Miller 2002 and Falk et al. 2018) and examine how these preferences relate to the rents earned by the workers they lead and the leadership styles they employ. One could take our predictions to the lab, creating labor markets with competitive wage-setting and ones with wage floors, seeing whether the choice of leadership styles by participants in the role of leaders are affected by this.

Lastly, it would be interesting to further expand the growing evidence base on the causal effects of leadership styles in the field (see Grant and Gino 2010, Kosfeld and Neckermann 2011, Kosfeld and Rustagi 2015, Kvaløy et al. 2015, Antonakis et al. 2015, Bradler et al. 2016, and Englmaier et al. 2018). According to our theoretical analysis, such studies should also pay attention to employees' willingness to stay with their current employer (as measured by questionnaires or using data on voluntary quits) in addition to their motivation and performance. Our theory predicts that the effects of unfriendly leadership on employee retention are most pronounced in competitive labor markets.<sup>20</sup>

## Appendix A

**Proof of Proposition 1.** First consider the case  $r \leq k_F^h$ . By (F), style  $F$  is dominated by pure monetary incentives. From  $\min\{r, \underline{u} - \underline{w}\} \leq r$  and  $k_F^h \leq \rho k_F^h + (1 - \rho)k_F^l$ , it follows that (FF) is not satisfied, which implies that style  $FF$  is also dominated by pure monetary incentives.

Now consider the case  $r > k_F^h$ . By (F), style  $F$  dominates pure monetary incentives. By (FF), style  $FF$  also dominates pure monetary incentives iff

$$(1 - \rho)k_F^l < \min\{r, \underline{u} - \underline{w}\} - \rho k_F^h.$$

Moreover, comparing  $C_F$  and  $C_{FF}$ , style  $FF$  dominates style  $F$  iff

$$\begin{aligned} \max\{\underline{u} - r, \underline{w}\} + \rho k_F^h + (1 - \rho)k_F^l &< -\rho(r - k_F^h) + \underline{u} \\ \Leftrightarrow (1 - \rho)k_F^l &< \min\{r, \underline{u} - \underline{w}\} - \rho r. \end{aligned}$$

Overall, style  $FF$  dominates both style  $F$  and pure monetary incentives iff

$$(1 - \rho)k_F^l < \min\{\min\{r, \underline{u} - \underline{w}\} - \rho k_F^h, \min\{r, \underline{u} - \underline{w}\} - \rho r\} = \min\{r, \underline{u} - \underline{w}\} - \rho r.$$

■

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<sup>20</sup>Relatedly, Lott-Lavigna (2018) suggests that the “angry-chef culture” in the UK will die out when restaurants face a staff shortage as a consequence of the Brexit.

**Proof of Proposition 2.** First note that condition (U) holds if and only if the following two conditions are satisfied simultaneously:

$$\frac{k_U^l}{s} < \frac{\rho}{1-\rho}, \quad (1-\rho)(s + k_U^l) < \underline{w} - \underline{u}.$$

Case (i) of the proposition thus immediately follows from conditions (F) and (U) as well as Lemma 4.

Now consider case (ii). By condition (F), style  $F$  dominates the benchmark of pure monetary incentives. From Lemma 4 and condition (U), additionally engaging in unfriendly leadership actions in case of low output is optimal if  $\frac{k_U^l}{s} < \frac{\rho}{1-\rho}$  and (U') holds. The claim thus follows.

Finally, consider case (iii). From (F) and Lemma 4, neither style  $F$  and nor style  $FU$  are profitable relative to pure monetary incentives. The claim thus follows from condition (U). ■

**Proof of Lemma 6.** We first consider  $LS = 0$ . The leader's participation constraint is given by

$$(1-\theta)(w_l + \rho b_l) + \theta(w^* + \rho b^* - c) \geq \underline{u}_l \Leftrightarrow w_l + \rho b_l \geq \frac{1}{1-\theta}(\underline{u}_l - \theta \max\{\underline{u}, \underline{w}\}).$$

Using Lemma 5, the optimal leader type  $\theta_0^*$  thus solves

$$\min_{\theta \in [\underline{\theta}_U, \underline{\theta}_F]} \frac{1}{1-\theta}(\underline{u}_l - \theta \max\{\underline{u}, \underline{w}\}).$$

The objective function is strictly increasing in  $\theta$  if and only if  $\underline{u}_l > \max\{\underline{u}, \underline{w}\}$  and strictly decreasing in  $\theta$  if and only if  $\underline{u}_l < \max\{\underline{u}, \underline{w}\}$ , which implies:

$$\theta_0^* = \begin{cases} \underline{\theta}_U & \text{if } \underline{u}_l > \max\{\underline{u}, \underline{w}\} \\ \underline{\theta}_F & \text{if } \underline{u}_l < \max\{\underline{u}, \underline{w}\} \end{cases}$$

If  $\underline{u}_l = \max\{\underline{u}, \underline{w}\}$ , then  $\theta_0^*$  can be any type  $\theta \in [\underline{\theta}_U, \underline{\theta}_F]$ . Hence, the results presented in the lemma for  $LS = 0$  follow.

Now consider  $LS = F$ . The leader's participation constraint is

$$\begin{aligned} (1-\theta)(w_l + \rho b_l - \rho k_F^h) + \theta(w_F^* + \rho(b_F^* + r) - c) &\geq u_l \\ \Leftrightarrow w_l + \rho b_l &\geq \frac{1}{1-\theta}(u_l - \theta \max\{\underline{u}, \underline{w}\}) + \rho k_F^h. \end{aligned}$$

The optimal leader type  $\theta_F^*$  thus solves

$$\min_{\theta \in [\underline{\theta}_F, \underline{\theta}_{FF}]} \frac{1}{1 - \theta} (\underline{u}_l - \theta \max\{\underline{u}, \underline{w}\}),$$

which implies that

$$\theta_F^* = \begin{cases} \underline{\theta}_F & \text{if } \underline{u}_l \geq \max\{\underline{u}, \underline{w}\} \\ \underline{\theta}_{FF}, & \text{if } \underline{u}_l < \max\{\underline{u}, \underline{w}\} \end{cases}$$

and  $\hat{C}_F$  as given in the lemma. The results for  $LS \in \{FF, U, UU\}$  are derived analogously. ■

**Proof of Proposition 5.** If  $\underline{w} < \underline{u}$  and  $\underline{u}_l < \underline{u}$ , the principal's cost functions become

$$\begin{aligned} \hat{C}_F &= c + \underline{u} - \rho(r - k_F^h) + w_l^c(\underline{\theta}_{FF}), \\ \hat{C}_0 &= c + \underline{u} + w_l^c(\underline{\theta}_F), \\ \hat{C}_U &= c + \underline{u} + s - \rho s + (1 - \rho)k_U^l + w_l^c(\underline{\theta}_U), \\ \hat{C}_{UU} &= c + \underline{u} + s + \rho k_U^h + (1 - \rho)k_U^l + w_l^c(\underline{\theta}_{UU}). \end{aligned}$$

We have  $w_l^c(\underline{\theta}_{FF}) \leq w_l^c(\underline{\theta}_F) < w_l^c(\underline{\theta}_U) \leq w_l^c(\underline{\theta}_{UU})$  and hence, using also that  $r \geq k_F^h$ ,  $\hat{C}_F \leq \hat{C}_0 < \hat{C}_U < \hat{C}_{UU}$ . It remains to show that  $\hat{C}_{FF} \leq \hat{C}_F$ . For  $\underline{u} \geq \underline{w} + r$  we obtain

$$\hat{C}_{FF} = c + \underline{u} - r + \rho k_F^h + (1 - \rho)k_F^l + w_l^c(\bar{\theta}).$$

From  $w_l^c(\bar{\theta}) < w_l^c(\underline{\theta}_{FF})$  and  $r \geq k_F^l$  it follows that  $\hat{C}_{FF} < \hat{C}_F$ . For  $\underline{u} < \underline{w} + r$ , using  $\bar{\theta} = 1/2$ , we have

$$\hat{C}_{FF} = c + \rho k_F^h + (1 - \rho)k_F^l + 2\underline{u}_l - r = c - \rho(r - k_F^h) - (1 - \rho)(r - k_F^l) + 2\underline{u}_l.$$

For  $\hat{C}_F$ , using  $\underline{\theta}_{FF} = k_F^l / (r + k_F^l)$ , we obtain

$$\hat{C}_F = c + \underline{u} - \rho(r - k_F^h) + \frac{r + k_F^l}{r} \underline{u}_l - \frac{k_F^l}{r} \underline{u} = c - \rho(r - k_F^h) + \frac{r + k_F^l}{r} \underline{u}_l + \frac{r - k_F^l}{r} \underline{u}.$$

It is straightforward to verify that  $2\underline{u}_l \leq \frac{r + k_F^l}{r} \underline{u}_l + \frac{r - k_F^l}{r} \underline{u}$ . Hence, because  $r \geq k_F^l$ , we have  $\hat{C}_{FF} \leq \hat{C}_F$ . ■

**Optimal leadership styles for the case where  $\underline{w} > \underline{u}$ ,  $\theta = 0$ , and style  $FU$  is not**



**available.** In this situation, the principal's total costs are:

$$\begin{aligned}\hat{C}_{FF} &= c + \underline{w} + \left[ \rho k_F^h + (1 - \rho) k_F^l + \underline{u}_l \right], \\ \hat{C}_F &= c + \underline{w} - \rho r + \left[ \rho k_F^h + \underline{u}_l \right], \\ \hat{C}_0 &= c + \underline{w} + \underline{u}_l, \\ \hat{C}_U &= c + \max\{\underline{u} + s, \underline{w}\} - \rho s + \left[ (1 - \rho) k_U^l + \underline{u}_l \right], \\ \hat{C}_{UU} &= c + \max\{\underline{u} + s, \underline{w}\} + \left[ \rho k_U^h + (1 - \rho) k_U^l + \underline{u}_l \right].\end{aligned}$$

Because  $\hat{C}_{FF} > \hat{C}_F$  and  $\hat{C}_{UU} > \hat{C}_U$ , the principal never implements styles  $FF$  and  $UU$ . Because of Assumption 1,  $\hat{C}_0 \geq \hat{C}_F$  so that pure monetary incentives are weakly dominated by style  $F$ . Style  $U$  dominates style  $F$  iff:

$$\max\{\underline{u} + s, \underline{w}\} - \rho s + (1 - \rho) k_U^l < \underline{w} - \rho r + \rho k_F^h.$$

In case  $\underline{w} \geq \underline{u} + s$ , the above condition becomes:

$$-s + \frac{1 - \rho}{\rho} k_U^l < -r + k_F^h.$$

In case  $\underline{w} < \underline{u} + s$ , the condition becomes:

$$(1 - \rho)(s + k_U^l) + \rho(r - k_F^h) < \underline{w} - \underline{u}.$$

Hence, style  $U$  dominates style  $F$  either if

$$(1 - \rho)(s + k_U^l) + \rho(r - k_F^h) < \underline{w} - \underline{u} < s$$

or if

$$s \leq \underline{w} - \underline{u} \quad \text{and} \quad -s + \frac{1 - \rho}{\rho} k_U^l < -r + k_F^h.$$

■

## Appendix B

We now discuss how our assumption that the leader incurs costs when she engages in leadership actions affects our results. Suppose that the leader does not incur any costs, i.e.,  $k_F^l = k_F^h = k_U^h = k_U^l = 0$ . If the principal hires a selfish leader, the leader will always follow the principal's announced leadership style because she is indifferent between undertaking and not undertaking any leadership action. Thus, the adoption of all leadership styles is credible with a selfish leader in a one-shot interaction. Moreover, the results

presented in Proposition 1 and Proposition 2 continue to hold for zero leadership costs. Hence, unfriendly leadership is never used under competitive wage-setting. Moreover, under non-competitive wage-setting and zero leadership costs, case (ii) of Proposition 2 applies, implying that unfriendly leadership actions continue to be optimal—as part of leadership style  $FU$ —when the worker’s rent in the benchmark case is sufficiently high.

If the principal hires an altruistic leader, the leader will always praise the worker, i.e., implement leadership style  $FF$ . By contrast, if the principal hires a spiteful leader, the leader will always scold the worker, i.e., adopt leadership style  $UU$ . The principal can now benefit from hiring a leader with social preferences only if such a leader demands a lower wage than a selfish leader because of income gaps between workers and leaders.

## Appendix C

In the model presented in the main body of our paper, we have shown that the existence of worker rents may entail unfriendly leadership actions. These rents arise or are amplified because the principal needs to provide the worker with effort incentives in the presence of a wage floor.<sup>21</sup> We now present a variant of our model where rents may emerge due to exogenous firm characteristics instead of incentive provision. Nevertheless, a wage floor remains essential in our analysis, as will become clear below.

As in Section 5, we consider a one-period employment relationship where the principal may hire a leader with social preferences. In contrast to our previous setting, we now assume that output is observable but not contractible so that the worker cannot be motivated through monetary incentives. Moreover, when the worker accepts the principal’s contract offer and works at the principal’s firm, he realizes an exogenous expected benefit  $\Delta$ , with  $0 \leq \Delta \leq \bar{\Delta}$ , which arises because of firm-specific characteristics. For instance, the firm may allow the worker to acquire particularly valuable general human capital, or offer unique networking opportunities, or allow the worker to signal a high ability to future employers, all of which will lead to more attractive job opportunities in the future. The firm could be a starred restaurant that allows the worker to learn from its ingenious chef, or a research institution that offers access to a valuable network of researchers, or a major law firm that allows the worker to work on high-profile cases.

The principal still wants the worker to exert high effort, but the worker can be motivated only through leadership actions. We assume that both style  $U$  and style  $F$  provide the worker with sufficient incentives to exert high effort, i.e.,  $s, r \geq c/\rho$ . As a consequence, style  $FU$  is dominated because this style would only lead to additional

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<sup>21</sup>If effort was contractible, the principal could pay the worker a flat wage  $\underline{w} + c$ , so that a rent arises if and only if  $\underline{w} > \underline{w} + c$ . With non-contractible effort, however, a flat wage is not incentive compatible. The worker therefore earns a rent for lower values of  $\underline{w}$ , namely if and only if  $\underline{w} > \underline{w}$ , as we have shown in Section 4.1.

leadership costs compared to style  $F$  or style  $U$ . Moreover, the unconditional styles  $UU$  and  $FF$  are not feasible because they cannot incentivize the worker. We can thus focus on comparing the principal's overall costs under style  $F$  and style  $U$ . For simplicity, we further assume that style  $F$  and  $U$  are equally effective regarding the provision of incentives, i.e.,  $s = r$ , and equally costly, i.e.,  $k_F^h = k_U^l =: k > 0$ . The benefit  $\Delta$  is independent of the adopted leadership style. All other assumptions remain as specified in Section 3.

Under style  $F$ , the worker's wage  $w$  has to satisfy the following constraints:

$$\begin{aligned} w + \rho r - c &\geq w, \\ w + \rho r - c + \Delta &\geq \underline{u}, \\ w &\geq \underline{w}. \end{aligned}$$

The first constraint ensures that the worker will choose high instead of low effort and is satisfied by assumption. The second constraint ensures the worker's participation, and the third constraint describes the wage floor. We thus obtain for the principal's total wage costs under style  $F$ , denoted  $\Gamma_F$ :

$$\Gamma_F = \max\{\underline{u} + c - \rho r - \Delta, \underline{w}\} + \rho k + W_l^F.$$

$W_l^F$  denotes the leader's wage net of leadership costs. The worker earns a rent if and only if  $\underline{u} + c - \rho r - \Delta < \underline{w}$ , i.e., if the extra benefit from working for the principal,  $\Delta$ , is sufficiently large. We assume that  $\underline{u} + c - \rho r \geq \underline{w}$ , which implies that the worker does not earn a rent when there is no extra benefit from working for the principal. In other words, a wage floor alone does not lead to worker rents, but its existence is required to obtain worker rents for sufficiently high  $\Delta$ . Without a wage floor, the principal can always extract all rents from the worker, no matter how high those rents are. Arguably, a wage floor exists for nearly every employment relationship.

$W_l^F$  can be derived analogously to our analysis in Section 5:

$$W_l^F = \frac{1}{1 - \tilde{\theta}_F} (\underline{u}_l - \tilde{\theta}_F \max\{\underline{u}, \underline{w} + \rho r - c + \Delta\}).$$

Here,  $\tilde{\theta}_F$  denotes the leader's optimal type, which is given by:

$$\tilde{\theta}_F = \begin{cases} \frac{k}{r+k} & \text{if } \underline{u}_l \geq \max\{\underline{u}, \underline{w} + \rho r - c + \Delta\} \\ \frac{k_F^l}{r+k_F^l} & \text{otherwise} \end{cases}.$$

Under style  $U$ , it needs to hold that:

$$\begin{aligned} w - (1 - \rho)r - c &\geq w - r, \\ w - (1 - \rho)r - c + \Delta &\geq \underline{u}, \\ w &\geq \underline{w}. \end{aligned}$$

For the principal's total wage costs under style  $U$ , denoted  $\Gamma_U$ , we obtain:

$$\Gamma_U = \max\{\underline{u} + c + (1 - \rho)r - \Delta, \underline{w}\} + (1 - \rho)k + W_l^U.$$

Because we assume that  $\underline{u} + c - \rho r > \underline{w}$ , the worker does not earn a rent under style  $U$  if  $\Delta = 0$ , but he earns a rent if  $\underline{u} + c + (1 - \rho)r - \Delta < \underline{w}$ .  $W_l^U$  denotes the leader's wage net of leadership costs:

$$W_l^U = \frac{1}{1 - \tilde{\theta}_U} (\underline{u}_l - \tilde{\theta}_U \max\{\underline{u}, \underline{w} - (1 - \rho)r - c + \Delta\}).$$

The leader's optimal type,  $\tilde{\theta}_U$ , is given by:

$$\tilde{\theta}_U = \begin{cases} -\frac{k_U^h}{r - k_U^h} & \text{if } \underline{u}_l \geq \max\{\underline{u}, \underline{w} - (1 - \rho)r - c + \Delta\} \\ -\frac{k}{r - k} & \text{otherwise} \end{cases}.$$

Comparing  $\Gamma_F$  and  $\Gamma_U$ , we see that style  $F$  always leads to weakly lower wage payments to the worker than style  $U$ . However, the difference between the wage payments depends on  $\Delta$  and will be eliminated if  $\Delta$  is sufficiently large because the worker then obtains the lowest feasible wage  $\underline{w}$  under either style.

In order to describe the principal's optimal choice between leadership style, we define thresholds  $\Delta_F$  and  $\Delta_U$ ,

$$\Delta_F := \underline{u} + c - \rho r - \underline{w}, \quad \Delta_U := \underline{u} + c + (1 - \rho)r - \underline{w},$$

where it holds that  $0 < \Delta_F < \Delta_U$ . We focus on a situation where the leader's wage net of leadership costs is higher under style  $F$  than under style  $U$ , i.e.,  $W_l^F - W_l^U \geq 0$ . This is the case if the leader's reservation utility is always weakly higher than the worker's net payoff, i.e.,  $\underline{u}_l \geq \max\{\underline{u}, \underline{w} + \rho r - c + \bar{\Delta}\}$ .

We obtain the following result:

- (i) If  $\Delta < \Delta_F$ , style  $U$  strictly dominates style  $F$  if and only if:

$$r < (2\rho - 1)k + W_l^F - W_l^U.$$

$W_l^F - W_l^U$  is independent of  $\Delta$ .

(ii) If  $\Delta_F \leq \Delta < \Delta_U$ , style  $U$  strictly dominates style  $F$  if and only if:

$$\underline{u} + c + (1 - \rho)r - \underline{w} - (2\rho - 1)k < \Delta + (W_l^F - W_l^U).$$

$\Delta + (W_l^F - W_l^U)$  is increasing in  $\Delta$ .

(iii) If  $\Delta_U < \Delta$ , style  $U$  strictly dominates style  $F$  if and only if:

$$(1 - 2\rho)k < W_l^F - W_l^U.$$

$W_l^F - W_l^U$  is decreasing in  $\Delta$ .

In case (i), the worker does not earn a rent under either style. Suppose for a moment that  $\underline{u}_l = \underline{u}$ , which implies that the leader's wage net of leadership costs is independent of his type, i.e.,  $W_l^F = W_l^U$ . Necessary conditions for style  $U$  to dominate style  $F$  then are  $\rho > 1/2$  and  $k > r$ . The former condition implies that unfriendly leadership is less costly to implement than friendly leadership, whereas the latter condition implies that engaging in friendly leadership actions is socially inefficient because the leader's costs exceed the worker's benefit.<sup>22</sup> If  $\underline{u}_l > \underline{u}$  implementing style  $U$  becomes more attractive because  $W_l^F > W_l^U$ .

In case (ii), the worker earns a rent under style  $F$ , but not under style  $U$ . Relative to case (i), style  $U$  becomes more attractive. Suppose for a moment that  $W_l^F = W_l^U$ . The principal prefers style  $U$  if  $\rho > 1/2$  and the worker's rent under style  $F$  is sufficiently large due to a high benefit  $\Delta$ . Our assumption  $\underline{u}_l \geq \max\{\underline{u}, \underline{w} + \rho r - c + \bar{\Delta}\}$  implies that  $W_l^F > W_l^U$ . Thus, because  $\Delta + (W_l^F - W_l^U)$  is increasing in  $\Delta$ , a higher benefit  $\Delta$  makes the principal implement style  $U$  for a greater region among the other parameters.

In case (iii), the benefit  $\Delta$  is so large that the worker earns a rent under either style, which also implies that the worker's wage is independent of the adopted style. Again, suppose for a moment that  $W_l^F = W_l^U$ . Then, the principal chooses style  $U$  whenever it entails lower leadership costs than style  $F$ , i.e.,  $\rho > 1/2$ . Our assumption  $\underline{u}_l \geq \max\{\underline{u}, \underline{w} + \rho r - c + \bar{\Delta}\}$  still implies that  $W_l^F > W_l^U$ . Thus,  $\rho > 1/2$  is sufficient for the implementation of style  $U$ . If  $\rho \leq 1/2$ , adoption of style  $U$  can still be optimal but is optimal for a smaller region among the other parameters as  $\Delta$  increases. The reason is that hiring an altruistic instead of a spiteful leader becomes less costly when the worker earns a higher rent.

Overall, provided that  $\rho > 1/2$ , style  $U$  dominates style  $F$  for a larger region among the other parameters the higher  $\Delta$ . The worker's rent is weakly increasing in  $\Delta$  under either style, but the rent is higher under style  $F$  than under style  $U$  for intermediate

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<sup>22</sup>Note that, in the current setting, the principal may implement style  $F$  even if  $k > r$  because monetary incentives are not available.

values of  $\Delta$ . The existence of worker rents reduces or even eliminates the comparative advantage that style  $F$  has over style  $U$  in terms of the expected wage that the principal needs to pay to the worker, similar to the results obtained in the model discussed in the main body of the paper.

Worker rents may also arise in a different kind of model where the employment relationship generates a quasi-rent that principal and agent share according to their relative bargaining powers. Quasi-rents can arise due to labor market frictions as studied in, e.g., Acemoglu and Pischke (1999). Consider a two-period model where the firm trains the worker in the first period and the worker exerts effort to produce an output in the second period as in our model above. In the first period, the worker may acquire firm-specific human capital that makes him more productive with the current firm than with other firms, leading to a quasi-rent. Alternatively, workers could have low or high ability and the firm learns the worker's ability in the first period, whereas other firms on the labor market do not learn the worker's ability. Again, a quasi-rent arises when the worker stays with the firm in the second period. Similar to the above model, the existence of quasi-rents that are shared between firm and worker may make the adoption of unfriendly styles less costly for the principal.

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