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Abstract

This paper develops a simple economic model to examine how leadership styles in organizations depend on the prevailing wage-setting conditions for workers. In particular, we examine a leader who can - in addition to the use of monetary incentives - motivate a worker by adopting leadership styles that differ in their non-monetary consequences for the worker's well-being. Some leadership styles produce non-monetary benefits for workers (such as those involving the provision of praise to high-performing workers), other styles impose non-monetary costs (such as those involving social punishment for low performers). We show that leaders never use the latter type of leadership when the worker is hired in a competitive labor market. In contrast, in labor markets with non-competitive wage-setting (e.g., in the presence of trade union bargaining or minimum wage legislation) leaders sometimes do use the 'unfriendly' style, and the more so the worse the worker's labor market prospects are. We show that this is socially inefficient. 'Friendly' leadership styles are always adopted when they are socially efficient.

JEL-Codes: M500.

Keywords: leadership styles, incentives, motivation, 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. 2018). 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 down. Clearly, the use of such 'unfriendly' leadership styles will decrease rather than increase workers' well-being on the job. 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."¹ 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."²

This paper is concerned with the question of leaders' choice of style and, in particular, how this choice is affected by the labor market conditions workers face. We compare leaders who employ workers hired in a competitive labor market with leaders who face a binding minimum wage constraint when hiring workers. Such a wage constraint may arise for a variety of reasons including trade union wage bargaining, minimum wage legislation, and downward wage rigidity. We find that the presence of a wage constraint has major consequences for the use of the 'unfriendly' leadership style. While it is never used when workers are hired in a competitive labor market, the 'unfriendly' leadership style is sometimes used when wage-setting is non-competitive, and the more so the worse the workers' labor market prospects are. The intuition is that in competitive labor markets, leaders need to compensate workers for all of the costs imposed on them by using an 'unfriendly' leadership style. When leaders can also motivate workers using incentive pay, they will never use the 'unfriendly' leadership style, because it is always more costly to attain higher effort in this way than by increasing incentive pay. In contrast, when leaders need to meet a binding minimum wage constraint, they sometimes do adopt the

¹See "Inside Amazon: Wrestling Big Ideas in a Bruising Workplace," The New York Times (August 15, 2015), which was retrieved from <https://www.nytimes.com/2015/08/16/technology/inside-amazon-wrestling-big-ideas-in-a-bruising-workplace.html>

²See "Fear and respect: VW's culture under Winterkorn," Reuters (October 10, 2015), which was retrieved from <https://www.reuters.com/article/us-volkswagen-emissions-culture-idUSKCN0S40MT20151010>

‘unfriendly’ leadership style, and particularly so when workers’ labor market prospects are bad. The reason is that in such labor markets, workers earn a rent when staying with their current employer, and hence need not be fully compensated for the harm imposed on them. This can make the ‘unfriendly’ leadership style an attractive alternative to incentive pay. The use of ‘friendly’ leadership styles is less responsive to wage-setting conditions, because the use of this style allows the leader to reduce total pay both in the presence and in the absence of a binding wage constraint.³

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

While the main part of our analysis considers a one-shot game and assumes commitment on the side of the leader, in the penultimate section we show that with repeated interaction between the leader and worker, the assumption of commitment is no longer needed. Indeed, our main results hold under self-enforcing contracts. Interestingly, while the self-enforcing condition for friendly leadership is independent of labor-market conditions, the condition for unfriendly leadership is not. If the worker’s labor market prospects are rather bad, unfriendly leadership is more likely to be self-enforcing. Moreover, unfriendly leadership may be self-enforcing when friendly leadership is not and vice versa.

The key insight of our paper is that leaders may adopt an unfriendly leadership style when workers earn rents from staying with their current employer. In our model, rents arise due to a binding minimum wage constraint. However, rents can also originate from other labor market policies such as employment protection legislation (EPL). Interestingly, Lepage-Saucier and Wasmer (2016) empirically show 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.⁴

³Clemens 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).

⁴As 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

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.⁵ Beber and Blattman (2013) add manipulation (in the form of intimidation, indoctrination, and misinformation) as 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 principal into account.

The paper is structured as follows. In the next section we discuss the related literature. Next, Section 3 describes our model. In Section 4 we analyze under which conditions the adoption of each leadership style is beneficial relative to pure monetary incentives, while in Section 5 we discuss the optimal choice between leadership styles. In Section 6 we study repeated interactions, and analyze under which conditions the leadership styles are self-enforcing. Finally, Section 7 concludes.

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. As demonstrated in a recent survey by Zehnder et al. (2017), this part of leadership has been largely ignored by economists so far. Our paper focuses on a key difference between motivating through leadership

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. Instead, they are chosen by the firm at the beginning of the employment period and then kept constant over time.

⁵Sherstyuk (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.

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 from wage constraints by adopting a leadership style that can exploit workers' preferences for praise or social punishments.

The huge literature on leadership styles 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 workers' well-being, we label the leader's style as 'friendly' or 'unfriendly'. We thus study a firm's optimal choice between two transactional leadership styles, that fundamentally differ in their consequences for workers' well-being.

Leadership scholars refer to the unfriendly style as destructive (Ferris et al., 2007), abusive (Tepper, 2000), incivil (Pearson et al., 2000), and toxic (Lipman-Blumen, 2004). The literature mainly treats these leadership styles as harmful and less efficient. However, some recent papers also discuss how destructive leadership in some situations can promote organizational performance (Salin, 2003, and Ferris et al., 2007). 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 unfriendly leadership style 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).

In our model the leader takes actions *ex post*, resulting in additional non-monetary utility/disutility for the worker. This contrasts the most common approach in the economics literature studying formally how leaders can motivate workers with words or actions. 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.⁶ Akerlof and Kranton (2000, 2005) and

⁶Several other papers on the economics of leadership also emphasize the importance of information.

Dur (2009) study how the leader can take actions that transform the worker's identity or his altruism towards the leader. Besley and Ghatak (2008) study a model where the principal can costlessly give a positional good in addition to a monetary bonus to well-performing agents. In contrast to all these papers, we consider performance contingent leadership actions that may also 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.

Our paper is also related to economic models of intrinsic motivation, such as Bénabou and Tirole (2003, 2006), Besley and Ghatak (2005), Delfgaauw and Dur (2007, 2008), and Ellingsen and Johannesson (2008) – see Besley and Ghatak (2018) and Cassar and Meier (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.

With respect to the (non-economic) leadership literature, our paper is related both to the literature on leadership emergence and leadership effectiveness (or leadership style). 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 the 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 (Bloom et al., 2012, House et al., 2004, Artz et al., 2018). 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

In Hermalin (1998, 2007), Komai et al. (2007), Komai and Stegman (2010), and Lazear (2012) the leader has followers because of superior skills or superior information about the right course of actions for the firm.

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 leader needs to hire a worker to perform a 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. Output is verifiable and can be high or low, where expected output increases with effort. Specifically, when effort is low, output is high with probability $\alpha \geq 0$. When effort is high, output is high with probability $\alpha + \rho$, where $0 < \rho$ and $\alpha + \rho < 1$. We assume that the leader always wants to induce the worker to choose high effort, because the increase in expected output always exceeds the increase in costs. Thus, our focus is not on *whether*, but on *how* the leader will motivate the worker.⁷

In order to motivate the worker, the leader can use monetary incentives and/or implement certain leadership styles. 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 choose between two leadership styles, friendly (style F) and unfriendly (style U). Style F provides non-monetary benefits r to workers conditional on good performance, e.g., through provision of praise. Style U imposes a non-monetary disutility on the worker of s when output is low, e.g., through social punishment. If the leader takes an action (i.e., either to provide praise or to engage in social punishment), this entails costs $k_i > 0$, where i is either F or U . The costs may reflect the leader’s opportunity costs of time when she interacts with the worker and/or psychological costs from taking the action. We also assume that adopting a leadership style is never sufficient to induce high effort; i.e., the leader will always set a strictly positive bonus. As will become clear later on, this assumption amounts to $r, s < c/\rho$.

In practice, the provision of the type of non-monetary benefits 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. This raises the question whether the leader can credibly commit to adopting a certain leadership style because imposing a (dis)utility on the worker is costly to the leader. In fact, in a one-shot interaction, the leader never wants to exercise leadership instruments *ex post*. However, for the time being, we simply abstract from commitment problems of the leader. In Section 6, we will

⁷We drop this assumption in Section 7.3.

show that the leader can commit to either leadership style if the employment relationship is repeated and the leader's discount factor is sufficiently high. Adopting leadership instruments will then be self-enforcing due to the leader's reputational concerns.

The worker is risk neutral and his reservation utility is $\bar{u} \geq 0$. The worker may be protected by limited liability, meaning that his earnings should always be at least equal to a minimum feasible wage level denoted by $\bar{w} \geq 0$. The minimum feasible wage level could be determined by trade union bargaining or minimum wage legislation.⁸ The absence of any exogenous wage restriction can be represented by $\bar{w} = -\infty$ in our model.

Since the leader is assumed to be always willing to induce high effort, the leader's objective is to minimize overall expected costs, which are composed of wage costs (base salary and bonus) and the costs of leadership, to induce high effort. Our benchmark case is an employment relationship governed by monetary incentives only, i.e., the leader does not implement a leadership style. When the wage constraint $w \geq \bar{w}$ is not binding in the benchmark case, we speak of competitive wage-setting. When the wage constraint is binding, wage-setting is non-competitive. The circumstances under which each of the two situations occurs will be described below.

Two remarks are in order. First, our model allows for different interpretations with respect to the leader's role within the firm and the feasibility of adopting different leadership styles. The above model describes a situation where the leader is the owner of the firm and hence the residual claimant of the production process and is able to choose whether or not to adopt a leadership style. However, if firm ownership and leadership do not coincide or if a leadership style is a fixed personality trait rather than a deliberate choice, we can easily adapt our model by separating leadership and firm ownership. The firm owner(s) then choose and commit to a leadership style by hiring a certain type of leader. They further stipulate the wage scheme for the worker and the leader. The leader has to be compensated for her outside option \bar{u}_l and her opportunity costs of time for taking leadership actions so that a friendly leader earns $\bar{u}_l + (\alpha + \rho)k_F$ and an unfriendly one earns $\bar{u}_l + (1 - \alpha - \rho)k_U$. The owner(s) will then make exactly the same decisions regarding leadership style and the worker's compensation as the leader in the above described model.

Second, friendly and unfriendly leadership are mutually exclusive in the above model. One might challenge this assumption if one believes that a leader can switch on or off each style depending on output. In Section 7.1, we therefore complement our analysis with the case where the leader can be both friendly and unfriendly depending on the worker's performance. As we will see, even if it is feasible to adopt both styles, the leader rarely wants to do so.

Overall, we do not take a stance on whether leadership styles can be chosen or are a

⁸The solution to the model does not change if \bar{w} was negative, in which case the worker could be held liable up to a certain amount of money.

fixed personality trait as our model can accommodate both cases.

4 Analysis

We start our analysis by examining the benchmark case where the leader does not adopt a leadership style. This setting corresponds to a standard moral-hazard model with binary outcome, binary effort, and limited liability (e.g., Laffont and Martimort, 2002). Next, we investigate whether or not the leader benefits from implementing a given leadership style relative to the benchmark case. This corresponds to a situation where the leader is able to adopt only one style, e.g., because different styles require different personality traits. In Section 5, we study a situation where the leader (or, equivalently, the firm owners) can choose between a friendly and an unfriendly style.

4.1 No leadership style

When the leader uses no leadership style, the only instrument to motivate the worker to exert high effort is the bonus b . 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, or:

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

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:

$$w + (\alpha + \rho)b - c \geq \bar{u} \Leftrightarrow w \geq \bar{u} - (\alpha + \rho)b + c.$$

In addition, the worker's base wage cannot be below the minimum level \bar{w} :

$$w \geq \bar{w}.$$

Hence, the leader minimizes expected wage costs by choosing the lowest bonus that triggers high effort, $b^* = c/\rho$, and the lowest base wage that both satisfies the exogenous wage constraint and ensures the participation of the worker:

$$w^* = \max \left\{ \bar{w}, \bar{u} - \alpha \frac{c}{\rho} \right\}.$$

If the minimum wage level \bar{w} is sufficiently small so that the wage constraint is not binding, i.e., $\bar{w} \leq \bar{u} - \alpha \frac{c}{\rho}$, we speak of *competitive wage-setting*. This is the case in the absence of exogenous wage restrictions ($\bar{w} = -\infty$) but also if wage restrictions have no bite as workers' outside options are high. By contrast, if $\bar{w} > \bar{u} - \alpha \frac{c}{\rho}$, the wage constraint

is binding and we refer to this situation as *non-competitive wage-setting*. Whether the wage constraint is binding or not does not only depend on the minimum feasible wage and the worker's outside option but also on the worker's preferences and the production technology: The higher the worker's effort costs or the less important high effort for producing high output (i.e., the higher α/ρ), the more likely the wage constraint is binding.

The total costs for the leader if she does not implement a leadership style, which we denote by C_0 , are simply the sum of the base salary and the expected bonus costs:

$$C_0 = w^* + (\alpha + \rho)b^* = \begin{cases} c + \bar{u} & \text{if } \bar{w} \leq \bar{u} - \alpha \frac{c}{\rho}, \\ c + \bar{w} + \alpha \frac{c}{\rho} & \text{otherwise.} \end{cases}$$

Hence, with competitive wage-setting, the leader exactly compensates the worker for his cost of effort as well as for missing out on his outside opportunities. By contrast, under non-competitive wage-setting, the leader's costs increase by the difference between the worker's expected wage if he would choose low effort, $\bar{w} + \alpha(c/\rho)$, and his outside option, \bar{u} . This cost increase translates into a rent for the worker, which amounts to $\bar{w} - \bar{u} + \alpha(c/\rho)$.

4.2 Friendly leadership style

Now suppose the leader can adopt a friendly leadership style that entails a non-monetary benefit r to the worker conditional on good performance at cost k_F to the leader. If the leader adopts this style, the worker exerts high effort if:

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

The worker accepts the job if:

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

In addition, the worker's base wage cannot be below the minimum level \bar{w} . It follows that the optimal bonus is $b_F^* = (c/\rho) - r$ and the optimal base wage amounts to:

$$w_F^* = \max \left\{ \bar{w}, \bar{u} - \alpha \frac{c}{\rho} \right\}.$$

Hence, adoption of the friendly leadership style allows the leader to set a lower bonus, namely a reduction of r , whereas the optimal base wage does not change relative to the benchmark case without leadership.

The leader's total costs under a friendly leadership style become:

$$C_F = w_F^* + (\alpha + \rho)(b_F^* + k_F) = \begin{cases} c + \bar{u} + (\alpha + \rho)(k_F - r) & \text{if } \bar{w} \leq \bar{u} - \alpha \frac{c}{\rho}, \\ c + \bar{w} + \alpha \frac{c}{\rho} + (\alpha + \rho)(k_F - r) & \text{otherwise.} \end{cases}$$

Comparing C_F and C_0 , the total costs with and without adopting the friendly leadership style respectively, it follows that the leader's costs are reduced by adopting this friendly leadership if:

$$k_F - r < 0, \tag{F}$$

that is, when the utility gain for the worker is larger than the costs for the leader of implementing friendly leadership. Importantly, the cost reduction due to a friendly leadership style is independent of labor market characteristics, the worker's preferences, and the production technology. All benefits from adopting a friendly leadership style accrue to the leader, while the worker's expected utility remains unaffected by friendly leadership: His expected increase in non-monetary utility exactly corresponds to the bonus reduction. In particular, this also implies that friendly leadership is not exploited to reduce the worker's rent under non-competitive wage-setting.

We now ask the question whether the leader's choice is socially optimal. The adoption of a leadership style is socially optimal if it increases the total surplus generated within the leader-worker relationship. We thus need to compare the costs of leadership 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 since they merely constitute a transfer from the leader to the worker. The friendly leadership style increases the worker's expected utility by $(\alpha + \rho)r$ while the leader incurs expected costs $(\alpha + \rho)k_F$. It hence is socially optimal to adopt this style if $r > k_F$, which is in accordance with the leader's adoption decision.

Proposition 1 summarizes the results for a friendly leadership style.

Proposition 1 *Independent of whether the wage constraint binds or not, the leader prefers friendly leadership to no leadership if adopting friendly leadership is socially optimal, i.e., the worker's benefit exceeds the leader's costs ($k_F < r$). The worker's rent remains unaffected under friendly leadership relative to a situation without leadership.*

4.3 Unfriendly leadership style

Next consider unfriendly leadership. Under this style, the leader incurs a cost k_U to impose a social penalty on the worker after observing poor performance, implying a non-monetary cost of s for the worker. If the leader adopts this style, the worker exerts

high effort if:

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

The worker accepts the job if:

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

In addition, the worker's base wage cannot be below \bar{w} . The optimal bonus thus is $b_U^* = (c/\rho) - s$ and the optimal base wage is:

$$w_U^* = \max \left\{ \bar{w}, \bar{u} - \alpha \frac{c}{\rho} + s \right\}.$$

Accordingly, relative to a situation without leadership, unfriendly leadership allows the firm to lower the bonus by amount s . However, the leader might also need to increase the base wage to compensate the worker for the expected cost of the social penalty. This is always the case if unfriendly leadership is implemented under competitive wage-setting ($\bar{w} \leq \bar{u} - \alpha(c/\rho)$). The base wage needed to attract the worker must then increase by amount s . This exactly compensates the worker for the reduction in the bonus and the expected costs of the social penalty (which is imposed with probability $1 - \alpha - \rho$). If unfriendly leadership is implemented under non-competitive wage-setting ($\bar{w} > \bar{u} - \alpha(c/\rho)$), the leader only has to increase the base wage if s is so large that the term $\bar{u} - \alpha(c/\rho) + s - \bar{w}$ is positive, in which case the base wage has to be raised by this term. 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 wage 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 leader's total costs under unfriendly leadership become:

$$\begin{aligned} C_U &= w_U^* + (\alpha + \rho)b_U^* + (1 - \alpha - \rho)k_U \\ &= \begin{cases} c + \bar{u} + (1 - \alpha - \rho)(k_U + s) & \text{if } \bar{w} \leq \bar{u} - \alpha \frac{c}{\rho} + s, \\ c + \bar{w} + \alpha \frac{c}{\rho} - (\alpha + \rho)s + (1 - \alpha - \rho)k_U & \text{otherwise.} \end{cases} \end{aligned}$$

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 $(1 - \alpha - \rho)(k_U + s)$, and thus is never a good idea. Even though it motivates the worker, it does so by inflicting harm to the worker, for which the leader needs to offer compen-

sation in order to satisfy the participation constraint. The bonus is a better instrument. It motivates and brings an additional benefit to the worker, a benefit that the leader can recoup by reducing the base wage.

However, if the worker is hired under non-competitive wage-setting and hence earns a rent without leadership, the leader does not need to fully compensate the worker for the harm inflicted by unfriendly leadership. Thus, unfriendly leadership may become attractive to the leader. First consider the situation where unfriendly leadership drives the worker's rent down to zero, i.e., $\bar{w} \leq \bar{u} - \alpha(c/\rho) + s$. In this case, the leader benefits from the adoption of this leadership style if:

$$\begin{aligned} c + \bar{u} + (1 - \alpha - \rho)(k_U + s) &< c + \bar{w} + \alpha \frac{c}{\rho} \\ \Leftrightarrow \bar{u} - \alpha \frac{c}{\rho} + (1 - \alpha - \rho)(k_U + s) &< \bar{w}. \end{aligned}$$

Thus, the leader benefits from eliminating the worker's rent through unfriendly leadership if the minimum feasible wage satisfies:

$$\bar{u} - \alpha \frac{c}{\rho} + (1 - \alpha - \rho)(k_U + s) < \bar{w} \leq \bar{u} - \alpha \frac{c}{\rho} + s.$$

Such intermediate values of \bar{w} exist if and only if $(1 - \alpha - \rho)(k_U + s) < s$, which is equivalent to $k_U/s < (\alpha + \rho)/(1 - \alpha - \rho)$. Hence, if the cost-benefit ratio of unfriendly leadership is relatively small and \bar{w} takes intermediate values, the leader can profitably adopt an unfriendly leadership style. Now consider the situation where adoption of unfriendly leadership does not eliminate the rent for the worker, i.e., $\bar{w} > \bar{u} - \alpha(c/\rho) + s$. Now unfriendly leadership is beneficial for the leader if:

$$c + \bar{w} + \alpha \frac{c}{\rho} - (\alpha + \rho)s + (1 - \alpha - \rho)k_U < c + \bar{w} + \alpha \frac{c}{\rho},$$

which is again equivalent to $k_U/s < (\alpha + \rho)/(1 - \alpha - \rho)$.

Overall, from these two cases we can conclude that the leader prefers an unfriendly leadership style to a situation without leadership if and only if the following two conditions are satisfied:

$$\frac{k_U}{s} < \frac{\alpha + \rho}{1 - \alpha - \rho} \quad \text{and} \quad \bar{u} - \alpha \frac{c}{\rho} + (1 - \alpha - \rho)(k_U + s) < \bar{w}. \quad (U)$$

The first condition in (U) relates to the incentive effect of unfriendly leadership: The leader can decrease expected bonus costs by $(\alpha + \rho)s$ through incurring expected leadership costs $(1 - \alpha - \rho)k_U$. Only if the bonus reduction dominates the leadership costs, unfriendly leadership can be profitable. The second condition refers to the participation effect of unfriendly leadership: Only if the worker's rent without leadership, $\bar{w} - \bar{u} +$

$\alpha(c/\rho)$, is sufficiently large, the leader can benefit from adopting an unfriendly leadership style.

The more the penalty harms the worker (the larger s), the more likely the first condition in (U) holds. However, if s becomes too large, the second condition in (U) will not be satisfied. The firm then has to compensate the worker for unfriendly leadership by a rather high base wage so that this leadership style is not profitable. A high base probability of high output, α , unambiguously favors an unfriendly leadership style. The higher α , the more likely the bonus reduction takes effect and the less likely the leader has to incur k_U . In addition, the worker's rent is increasing in α . However, the impact of the output-effort sensitivity, ρ , is ambiguous. A higher ρ allows the leader to benefit more from the incentive effect but at the same time exacerbates the participation effect. A high output-effort sensitivity means that the worker responds strongly to monetary incentives and hence earns a lower rent.

Given that the cost-benefit ratio of unfriendly leadership is sufficiently small so that the first condition in (U) holds, an unfriendly leadership style is more likely to be adopted the bigger the difference between the minimum feasible wage level \bar{w} and the value of the worker's outside option \bar{u} . This implies that a worker is more likely to be subject to unfriendly leadership if he is locked in the current employment relationship because his labor market prospects are relatively unattractive. In addition, high effort costs c also favor an unfriendly leadership style. Workers with high effort costs are harder to incentivize by bonuses and therefore earn higher rents.

The worker always suffers from the adoption of an unfriendly leadership style because it always reduces his rent. Moreover, the implementation of unfriendly leadership is never socially desirable because it entails an expected utility loss of $(1 - \alpha - \rho)r$ for the worker and expected leadership costs of $(1 - \alpha - \rho)k_U$. As we have seen, the leader may nevertheless adopt this style under non-competitive wage-setting in order to divert rents from the worker.

The following proposition summarizes our findings for the case of unfriendly leadership

Proposition 2 *The leader prefers unfriendly leadership to no leadership if and only if the conditions in (U) hold. Unfriendly leadership is thus implemented only under non-competitive wage-setting and when the worker's labor market prospects are unattractive (i.e., $\bar{w} - \bar{u}$ is large). Unfriendly leadership lowers the worker's rent relative to the no-leadership benchmark and is socially inefficient.*

5 Optimal choice between leadership styles under non-competitive wage-setting

The analysis in Section 4 has shown that, with non-competitive wage-setting, leaders may benefit from complementing monetary incentives by both a friendly and an unfriendly leadership style. We now examine the optimal choice between no leadership style, friendly leadership, and unfriendly leadership under non-competitive wage setting. To facilitate the comparison of the two leadership styles, we assume that the leader incurs the same costs for praise and social pressure (i.e., $k_U = k_f \equiv k$) and the bonus can be reduced by the same amount of money under each style (i.e., $s = r$).

It will turn out that the following two conditions on the worker's rent in the benchmark case, given by $\bar{w} - \bar{u} + \alpha \frac{c}{\rho}$, are crucial for the choice of the optimal leadership style:

$$(1 - \alpha - \rho)(r + k) < \bar{w} - \bar{u} + \alpha \frac{c}{\rho} \quad (U')$$

$$r - (2(\alpha + \rho) - 1)k < \bar{w} - \bar{u} + \alpha \frac{c}{\rho} \quad (U'')$$

From the analysis in the foregoing section, we know that (U') is a necessary condition for unfriendly leadership to be profitable relative to the benchmark of pure monetary incentives (compare condition (U)). As we will see below, condition (U'') is a necessary condition for unfriendly leadership to dominate friendly leadership.⁹

The following proposition characterizes the leader's optimal choice of a leadership style.

Proposition 3 *Suppose that both leadership styles are equally effective at reducing monetary incentives ($s = r$) and lead to the same ex post costs for the leader ($k_U = k_f = k$). Further suppose that wage-setting is non-competitive.*

- (i) *If $\max \left\{ 1, \frac{\alpha + \rho}{1 - (\alpha + \rho)} \right\} \leq \frac{k}{r}$, then pure monetary incentives (weakly) dominate the adoption of a leadership style.*
- (ii) *If $\min \left\{ 1, \frac{\alpha + \rho}{1 - (\alpha + \rho)} \right\} \leq \frac{k}{r} < \max \left\{ 1, \frac{\alpha + \rho}{1 - (\alpha + \rho)} \right\}$ holds, at most one leadership style is profitable. If $\alpha + \rho \geq \frac{1}{2}$ and condition (U') holds, the leader implements the unfriendly style. If $\alpha + \rho < \frac{1}{2}$, the leader adopts the friendly style.*
- (iii) *If $\frac{k}{r} < \min \left\{ 1, \frac{\alpha + \rho}{1 - (\alpha + \rho)} \right\}$ holds, friendly leadership is always profitable. However, the unfriendly style is preferred to the friendly style if and only if $\alpha + \rho > \frac{1}{2}$ and condition (U'') holds.*

⁹If friendly leadership is profitable (i.e., $r > k$), condition (U'') is more restrictive than condition (U') as the left-hand side of (U'') is then larger.

From the above analysis and in particular conditions (F) and (U) it follows that, compared to the absence of a leadership style, the friendly leadership style is profitable if and only if $k/r < 1$, while a necessary condition for the unfriendly leadership style to be profitable is that $k/r < (\alpha + \rho)/(1 - (\alpha + \rho))$. Hence, in case (i) of Proposition 3, both leadership styles are too costly relative to their benefits and the worker should be motivated only through monetary incentives.

Now suppose the cost-benefit ratio k/r takes an intermediate value so that we are in case (ii) of the proposition. Now, interestingly, the unfriendly style can be the only profitable leadership style. If high output is more likely than low output (i.e., $\alpha + \rho \geq 1/2$), the situation is such that $1 \leq k/r < (\alpha + \rho)/(1 - \alpha - \rho)$. Friendly leadership is then not profitable because its cost-benefit ratio is too low. Unfriendly leadership, however, has the comparative advantage that leadership costs arise relatively infrequently because the worker is likely to be successful. It is thus profitable if the worker's rent in the absence of leadership, $\bar{w} - \bar{u} + \alpha(c/\rho)$, is sufficiently large, i.e., condition (U') is satisfied. The unfriendly leadership style thus dominates the friendly one if the worker is rather productive in the sense that high output is very likely even in case of low effort but his labor market prospects are not very attractive (i.e., $\bar{w} - \bar{u}$ is large). In contrast, if $\alpha + \rho < 1/2$, the leader will always adopt the friendly style.

Finally, case (iii) of the proposition demonstrates that, even if adopting a friendly leadership style is profitable relative to the benchmark, unfriendly leadership can be even more profitable. If the cost-benefit ratio k/r is so small that we are in case (iii) of the proposition, the friendly leadership style is always profitable relative to the benchmark. However, unfriendly leadership is more beneficial than friendly leadership if condition (U'') is satisfied and $\alpha + \rho > 1/2$ holds. The latter requirement, $\alpha + \rho > 1/2$, ensures that leadership costs arise less frequently under the unfriendly than under the friendly style because high output is rather likely. If, in addition, the worker earns a rent under unfriendly leadership (i.e., $\bar{w} - \bar{u} + \alpha \frac{c}{\rho} > r$), condition (U'') always holds and unfriendly leadership is optimal (note that $2(\alpha + \rho) > 1$). If the worker does not earn a rent under unfriendly leadership, it can still be the optimal leadership style provided that its total costs are below the costs of friendly leadership, which may be more expensive as it necessarily leads to a rent for the worker. (U'') is the corresponding condition. Again, unfriendly leadership is more likely when the worker's labor market prospects are rather unattractive relative to the lowest possible wage payment inside the firm, i.e., $\bar{w} - \bar{u}$ is large.

Overall, the results presented in Proposition 3 lead to a clear prediction regarding the relationship between labor market conditions and the adoption of a leadership style: The worse the agent's labor market prospects, i.e., the higher $\bar{w} - \bar{u}$, the more likely unfriendly leadership will dominate friendly leadership.

6 Self-enforcing leadership

The previous analysis has abstracted from the leader's problem to commit to adopting a given leadership style. We now address this issue by embedding the employment relationship in a repeated interaction. We assume that the leader needs to hire the worker for an infinite number of periods and has a discount factor $\delta \in (0, 1)$. When the leader offers the contract to the worker, she can also announce a leadership style. The worker believes that the leader will implement the announced style as long as the leader complies with her announcement. If the leader reneges on the announcement, the worker believes that she will never again adopt 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 without leadership (i.e., $C_F < C_0$ or $C_U < C_0$) – the leadership style is also self-enforcing. First consider friendly leadership and assume it is beneficial compared to no leadership, i.e., condition (F) holds and hence $r > k_F$. Friendly leadership is self-enforcing if:

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

The condition reflects that the leader will comply with her announcement when her short-term gain from non-compliance, k_F , 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 wage costs increase by $C_0 - C_F$ in each future period.

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

$$k_U \leq \sum_{t=1}^{\infty} \delta^t (C_0 - C_U) \quad (2)$$

Inspection of C_0 and C_U shows that the difference between the two wage cost functions depends on whether $\bar{w} > \bar{u} - \alpha(c/\rho) + s$ or not. First assume that this is the case. Condition (2) then becomes:

$$k_U \leq \frac{\delta}{1-\delta} [(\alpha + \rho)s - (1 - \alpha - \rho)k_U] \quad (3)$$

If $\bar{w} \leq \bar{u} - \alpha(c/\rho) + s$, condition (2) is equivalent to:

$$k_U \leq \frac{\delta}{1-\delta} \left[\bar{w} + \alpha \frac{c}{\rho} - \bar{u} - (1-\alpha-\rho)(k_U + s) \right] \quad (4)$$

From conditions (1), (3), and (4) it follows that there is a threshold $\bar{\delta} \in (0, 1)$ such that both leadership styles are self-enforcing for all $\delta \geq \bar{\delta}$. Hence, our previous analysis applies for situations with $\delta \geq \bar{\delta}$ where the leader sufficiently cares about future wage costs.

Condition (1) further shows that, whether the friendly leadership style is self-enforcing or not is independent of labor-market conditions as characterized by \bar{w} and \bar{u} . By contrast, by (4), whether unfriendly leadership is self-enforcing can be affected by labor-market conditions. If the worker's labor market prospects are rather bad, i.e., $\bar{w} - \bar{u}$ is high, unfriendly leadership is more likely to be self-enforcing.

Finally, the conditions imply that unfriendly leadership may be self-enforcing when friendly leadership is not and vice versa. To compare the self-enforcement properties of the two styles, suppose that $r = s$ and $k_U = k_F$. Comparison of (1) and (2) shows that, if $C_U < C_F$ ($C_U > C_F$), there are intermediate values for the discount factor δ where only the unfriendly (friendly) leadership is self-enforcing. Recall that $C_U < C_F$ holds if we are in case (iii) of Proposition 3, $\alpha + \rho \geq 1/2$ and (U'') is satisfied. Hence, in this situation, unfriendly leadership is self-enforcing for a larger range of discount factors than friendly leadership.

7 Discussion

7.1 Adopting both styles at the same time

So far we have assumed that the leader can adopt either a friendly or an unfriendly leadership style. She cannot, however, praise the worker when performance is high and exert social pressure when performance is low. When we drop this assumption, we find that the leader adopts both styles simultaneously if and only if they are both profitable relative to the benchmark of pure monetary incentives, i.e., both conditions (F) and (U) hold. Accordingly, both styles need to have sufficiently low cost-benefit ratios for the leader and, moreover, the worker's rent needs to be sufficiently high. Hence, the main prediction of our model does not change: Unfriendly leadership actions are more likely to be observed as the difference $\bar{w} - \bar{u}$ increases.

7.2 Non-contingent friendly leadership

Instead of only being friendly in case of high output, the leader could always be friendly to the worker. We show that "always being friendly" (henceforth, style AF) can be prof-

itable relative to pure monetary incentives only in a competitive labor market. Hence, our results regarding the adoption of the unfriendly style remain unaffected by the availability of style AF . However, the existence of a wage restriction – even if it is non-binding without leadership – may still affect the choice between the non-contingent friendly style (style AF) and a contingent friendly style (style F).

Assume that, if the leader always praises the worker independent of his output, this generates a fixed extra utility r for the worker while the leader always incurs costs k_F . As leadership has no incentive effect in this case, the bonus eliciting high effort is $b^* = c/\rho$. However, relative to the benchmark, the leader can reduce the base salary w by r as long as this does not violate the minimum wage constraint. Consequently, the optimal base wage now is

$$w_{AF}^* = \max \left\{ \bar{w}, \bar{u} - \alpha \frac{c}{\rho} - r \right\}.$$

The leader's total costs become

$$C_{AF} = w_{AF}^* + (\alpha + \rho)b^* + k_F = \begin{cases} c + \bar{u} + k_F - r & \text{if } \bar{w} \leq \bar{u} - \alpha \frac{c}{\rho} - r, \\ c + \bar{w} + \alpha \frac{c}{\rho} + k_F & \text{otherwise.} \end{cases}$$

When we compare these costs with the costs under pure monetary incentives, C_0 , it becomes immediately clear that always being friendly is not worthwhile for the leader under non-competitive wage-setting, i.e., if $\bar{w} > \bar{u} - \alpha(c/\rho)$. Intuitively, as the leader cannot lower the worker's base wage in this case, always being friendly only leads to additional costs for the leader. Hence, as unfriendly leadership is only used in a non-competitive labor market, our results on the adoption of unfriendly leadership remain valid if style AF is available.

For the remainder of this subsection, we focus on competitive wage setting, where $\bar{w} \leq \bar{u} - \alpha(c/\rho)$. It is straightforward to verify that style AF is profitable if and only if

$$k_F < \min \left\{ r, \bar{u} - \alpha \frac{c}{\rho} - \bar{w} \right\}.$$

The intuition behind this condition is that style AF can reduce the worker's base wage at most by $\bar{u} - \alpha(c/\rho) - \bar{w}$, which hence is the leader's maximum benefit from implementing style AF . When does the leader prefer style AF to style F ? Assume that style F is profitable (i.e., $k_F < r$). When we compare C_{AF} with the costs under style F , $C_F = c + \bar{u} + (\alpha + \rho)(k_F - r)$, we see that always being friendly is optimal whenever the minimum wage is sufficiently small, i.e., $\bar{w} \leq \bar{u} - \alpha \frac{c}{\rho} - r$. In this situation, style AF has the comparative advantage that the leader always benefits from the overall cost reduction $r - k_F$. Otherwise, however, style F dominates style AF .¹⁰

¹⁰See the appendix for a proof.

Recall that we focus on a situation where the wage restriction has no bite when the leader uses only pure non-monetary incentives. Nevertheless, the existence of a wage constraint may still affect the leader's style as it may induce the leader to be only friendly towards the worker when he produces a high output. The worker is compensated for the reduced friendliness by a higher base wage, but at the same time the leadership style becomes an incentive device, so that the worker's bonus is reduced.

7.3 Welfare-enhancing unfriendly leadership

The previous analysis has shown that unfriendly leadership is never efficient if high output is so valuable that the leader always wants to motivate the worker, even if this requires a rent payment. In this subsection, we show that unfriendly leadership can be welfare enhancing when the leader does not want to elicit high effort from the worker under pure monetary incentives because the worker's associated rent would be too large. That is, we now drop the assumption that the increase in expected output under high effort is so large that the leader always wants to motivate the worker.

We make the following additional assumptions. When the worker does not exert effort, output will always be low, $\alpha = 0$. This is only a simplifying assumption as the results are qualitatively similar for $\alpha > 0$. High output has value v for the leader, while low output has value zero. Under competitive wage setting, hiring the worker and eliciting high effort is optimal, i.e., $\rho v - c - \bar{u} > 0$. We now focus on non-competitive wage-setting for the remainder of this subsection, i.e., $\bar{w} > \bar{u}$. The leader does not want to hire the worker without motivating him to choose high effort because this would lead to a negative profit. Hence, the leader either hires and motivates the worker or does not hire the worker. In contrast to the above analysis, we now assume that, under pure monetary incentives, the leader is better off by not hiring the worker, i.e., $\rho v - c - \bar{w} < 0$. Under unfriendly leadership, however, the leader will hire and motivate the worker if and only if all of the following conditions hold:¹¹

$$(1 - \rho)(k_U + s) < \rho v - c - \bar{u} \tag{5}$$

$$(1 - \rho)k_U < s\rho \tag{6}$$

$$\bar{u} + (1 - \rho)(k_U + s) < \bar{w} < \rho v - c + \rho s - (1 - \rho)k_U \tag{7}$$

Condition (5) ensures that the total loss from unfriendly leadership does not exceed the value of the employment relationship in the first-best. Condition (6) corresponds to the first condition in (U) and ensures that the leader's expected benefit from unfriendly leadership exceeds the leader's expected costs. Finally, (7) is a condition on the labor market setting. As before, for unfriendly leadership to be profitable, \bar{w} needs to be

¹¹See the appendix for a proof.

sufficiently large relative to \bar{u} . In addition, \bar{w} must not be too large because then the leader's profit will not be positive under style U .

Hence, the possibility to reduce the worker's rent under unfriendly leadership may be welfare enhancing. Both leader and worker benefit when style U is adopted. The leader earns a positive expected profit when she hires the worker. When the worker is hired, he may earn a rent. In any case, his expected payoff is at least as large as his reservation utility \bar{u} . If the respective conditions from Proposition 3 hold, unfriendly leadership also dominates friendly leadership.

8 Concluding remarks

This paper has developed a simple model so as to analyze leaders' choice of leadership style under different wage-setting conditions. We have examined two leadership styles differing in their non-monetary consequences for workers (positive or negative). We have seen that leadership styles that are harmful to workers are only applied when wage-setting is non-competitive. The reason is that, with competitive wage-setting, leaders need to compensate workers for any harm, 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 leaders may use such unfriendly leadership styles, despite them being socially inefficient. Unfriendly leadership in such markets enables the leader to extract rents from the worker. On the other hand, we show that leadership styles that benefit workers are applied whenever they are socially efficient, independent of the wage-setting conditions.

In addition to concerns about social efficiency, the use of unfriendly leadership styles may also raise equity concerns. Our theory predicts that unfriendly leadership styles 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. Such arrangements are commonly more relevant at the lower ends of the wage distribution. Hence, we expect that workers with lower wages are more likely to suffer from unfriendly leadership styles, exacerbating the inequality in well-being.

The opportunity to use leadership as a motivational tool may change policy implications. Take the recent discussion about bonus caps for, among others, bankers. 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) will start using unfriendly leadership to compensate for the restrictions put on the use of monetary incentives (see also Benabou and Tirole 2016).

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. Our analysis in section 7.3 is a first step in the direction of such an analysis.

Empirically, it would be interesting to see whether there is a link between wage-setting institutions and styles of leadership, as reported by, e.g., employees in questionnaires. Also, 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, 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.

Appendix

Proof of Proposition 3. (i) Follows immediately from (F) and the first condition in (U) .

Now consider (ii). First suppose that $\alpha + \rho \geq 1/2$. This implies that $1 \leq k/r < (\alpha + \rho)/(1 - \alpha - \rho)$. From (F) it follows that friendly leadership is not profitable relative to the benchmark of no leadership. The claim thus follows from (U) . Now suppose that $\alpha + \rho < 1/2$, which implies that $(\alpha + \rho)/(1 - \alpha - \rho) \leq k/r < 1$. By (F) and (U) , friendly leadership is profitable while unfriendly leadership is not relative to the benchmark.

Finally, consider (iii). By (F) , friendly leadership dominates the benchmark of no leadership. It remains to show that the unfriendly style is superior to the friendly one if and only if $\alpha + \rho \geq 1/2$ and (U'') holds. As we are in a situation of non-competitive wage-setting, the leader's costs under friendly leadership are

$$c + \bar{w} + \alpha(c/\rho) + (\alpha + \rho)(k - r),$$

while the costs under unfriendly leadership are

$$\begin{cases} c + \bar{u} + (1 - \alpha - \rho)(k + r) & \text{if } \bar{w} \leq \bar{u} - \alpha \frac{c}{\rho} + r, \\ c + \bar{w} + \alpha \frac{c}{\rho} - (\alpha + \rho)r + (1 - \alpha - \rho)k & \text{otherwise.} \end{cases}$$

First suppose that $\bar{w} \leq \bar{u} - \alpha \frac{c}{\rho} + r$. Unfriendly leadership then leads to lower costs than friendly leadership iff

$$r - (2(\alpha + \rho) - 1)k < \bar{w} - \bar{u} + \alpha \frac{c}{\rho}.$$

In the current situation with $\bar{w} \leq \bar{u} - \alpha \frac{c}{\rho} + r$, such values of \bar{w} exist iff $\alpha + \rho > 1/2$. Now suppose that $\bar{w} > \bar{u} - \alpha \frac{c}{\rho} + r$. Unfriendly leadership then entails lower costs than friendly leadership iff $\alpha + \rho > 1/2$. Hence, combining the results from both cases, unfriendly leadership dominates friendly leadership iff

$$\alpha + \rho > 1/2 \quad \text{and} \quad r - (2(\alpha + \rho) - 1)k < \bar{w} - \bar{u} + \alpha \frac{c}{\rho}.$$

■

Proof of the claim that style F dominates style AF in case $\bar{u} - \alpha(c/\rho) - r < \bar{w} \leq \bar{u} - \alpha(c/\rho)$. Style F leads to lower costs than style AF iff

$$\begin{aligned} c + \bar{u} + (\alpha + \rho)(k_F - r) &< c + \bar{w} + \alpha(c/\rho) + k_F \\ \Leftrightarrow \bar{u} - \alpha(c/\rho) - [(\alpha + \rho)r + (1 - \alpha - \rho)k_F] &< \bar{w} \end{aligned}$$

The last inequality holds because $k_F < r$ implies that $(\alpha + \rho)r + (1 - \alpha - \rho)k_F < r$ and, by assumption, we have $\bar{u} - \alpha(c/\rho) - r < \bar{w}$. ■

Proof of the claim that style U is welfare enhancing if the conditions (5), (6), and (7) hold. First suppose that $\bar{w} \leq \bar{u} + s$, implying that $C_U = c + \bar{u} + (1 - \rho)(k_U + s)$. It follows that, when the leader hires and motivates the worker adopting style U , expected profit is $\rho v - c - \bar{u} - (1 - \rho)(k_U + s)$. For this term to be positive, we need (5) to hold. Furthermore, for a positive expected profit under style U not to be in contradiction to $\rho v - c - \bar{w} < 0$, we must have that $\bar{u} + (1 - \rho)(k_U + s) < \bar{w} \leq \bar{u} + s$. Such values of \bar{w} exist iff (6) holds.

Now suppose that $\bar{w} > \bar{u} + s$, implying that $C_U = c + \bar{w} - \rho s + (1 - \rho)k_U$. When the leader hires and motivates the worker adopting style U , expected profit is $\rho v - c - \bar{w} + \rho s - (1 - \rho)k_U$. For the expected profit to be positive, it is required that (6) holds. Moreover, we need that $\rho v - c + \rho s - (1 - \rho)k_U > \bar{w} > \bar{u} + s$. Such values of \bar{w} exist iff (5) holds.

Combining the conditions on \bar{w} from the two cases yields (7). ■

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