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Envy in the workplace

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HIGHLIGHTS

- I study an adverse selection model when there is envy towards boss and colleagues.
- Envy never distorts the effort of the high-productivity employees.
- Envy towards a colleague distorts the effort of the low-productivity employees.
- This distortion is mitigated when employees also envy their boss.
- I shed light on the complementarity between these two forms of envy.

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ABSTRACT

Envy affects the optimal employment contract offered to employees with different productivity. The employees' envy towards colleagues distorts the effort exerted by the less productive employees. However, this distortion is mitigated when employees are also envious towards their boss.

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1. Introduction

Lavish CEO compensation often makes headlines and many commentators highlight how executives' bonuses and perks can rankle. This is especially so when there is a hefty difference with the average worker pay (see Mishel and Sabadish, 2012). Moreover, pay inequality among peers can also be detrimental to the work atmosphere as highlighted by recent experimental evidence (see Breza et al., 2015). Surveys and empirical evidence show that employees are interested in how their wage compares to the firm's profits and/or to the colleagues' wage (see Bewley, 1995, 1999, Blinder and Choi, 1990, Campbell and Kamlani, 1997, and Card et al., 2012).

This paper studies the interaction between envy towards the boss and the colleagues. So far these two forms of envy have been studied separately. Dur and Glazer (2008) have studied the case in which employees are envious towards their boss. The present article departs from their analysis considering that employees can differ in their productivity and this is their own private information. Moreover, like Desiraju and Sappington (2007) and von Siemens (2011, 2012), I assume that employees can envy their peers. In the model, I consider both forms of envy simultaneously and I highlight the presence of an interaction effect between them.

By focusing on an adverse-selection problem, this paper also complements the literature that studies optimal incentive contracts when employees are motivated by fairness considerations in a moral hazard setting (see among others Bartling and von Siemens, 2010, Englmaier and Wambach, 2010, Kragl and Schmid, 2009, and Neilson and Stowe, 2010).[1]

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[1] With the exception of Englmaier and Wambach (2010), the other articles cited in the text study a situation in which the employees envy their colleagues but not their boss.

2. The model

I develop a model with one principal (the boss) and multiple agents (employees). The boss offers a contract to her employees which consists of a wage ω and effort e. The effort of each employee is observable and verifiable.

There is a continuum of employees with measure one. Employees may differ in their cost of exerting effort (henceforth, productivity) θ with $\theta \in \{\underline{\theta}, \overline{\theta}\}$ and $\Delta\theta = \overline{\theta} - \underline{\theta} > 0$; μ is the fraction of high-productivity employees and $1-\mu$ is the fraction of low-productivity employees and $\mu \in (0,1)$. Employees are risk neutral, wealth constrained, and have a reservation wage of zero. The low-productivity and the high-productivity employees' utilities are:

$$\begin{aligned} V_L &= \omega_L - \frac{\overline{\theta}}{2}e_L^2 - \alpha(\max\{\Pi - R_L, 0\}) \\ &\quad - \beta(\max\{R_H - R_L, 0\}); \\ V_H &= \omega_H - \frac{\underline{\theta}}{2}e_H^2 - \alpha(\max\{\Pi - R_H, 0\}) \\ &\quad - \beta(\max\{R_L - R_H, 0\}) \end{aligned} \tag{1}$$

where Π are the boss' profits and R_i is the material rent paid to employee i with $i = L, H$. The material rent is defined as the difference between the wage and the cost of exerting effort.

Employees may suffer a utility loss whenever they feel worse off than their boss and/or colleagues. An employee may be envious towards the boss if the difference between the boss' profits and his own rent is positive. The parameter $\alpha \geq 0$ measures the employees' envy towards their boss. An employee may be envious towards his colleagues if he receives a lower rent than that of other employees in the firm. The parameter $\beta \geq 0$ measures the employees' envy towards a higher-net-earner colleague. α and β are common knowledge.[2]

The **timing of the game** is as follows. In stage 0, each employee is informed about his own type; in stage 1, the boss offers a menu of contracts consisting of levels of effort and wages; in stage 2, employees independently decide whether or not to accept the contract. Once hired the employment contract and the type of each employee become common knowledge[3]; in stage 3, the effort is exerted, production is undertaken, wages are paid, and profits are realized.

2.1. The Benchmark case

If productivity is observable, the boss can exactly compensate each employee for his production costs. Since there will be no rent inequality, the employees' envy may solely be directed towards their boss. The wages cover the cost of effort plus the employee's disutility due to envy, making each employee indifferent between accepting and rejecting the contract, given the required level of effort:

$$\omega_L = \frac{\overline{\theta}}{2}e_L^2 + \alpha(\Pi - R_L); \qquad \omega_H = \frac{\underline{\theta}}{2}e_H^2 + \alpha(\Pi - R_H). \tag{2}$$

Since $R_L = \omega_L - \frac{\overline{\theta}}{2}e_L^2$ and $R_H = \omega_H - \frac{\underline{\theta}}{2}e_H^2$, Eq. (2) can be rewritten as:

$$\omega_L = \frac{\overline{\theta}}{2}e_L^2 + \frac{\alpha}{1+\alpha}\Pi; \qquad \omega_H = \frac{\underline{\theta}}{2}e_H^2 + \frac{\alpha}{1+\alpha}\Pi. \tag{3}$$

Proposition 1 illustrates the optimal contract:

Proposition 1. *With perfect information on the employees' productivity,*

- *required levels of effort are:* $e_L^{FB} = \frac{1}{\overline{\theta}} < e_H^{FB} = \frac{1}{\underline{\theta}}$;
- *wages are:* $\omega_L^{FB} = \frac{1}{2\overline{\theta}} + \frac{\alpha(\underline{\theta}+\mu\Delta\theta)}{2(1+2\alpha)\underline{\theta}\overline{\theta}} < \omega_H^{FB} = \frac{1}{2\underline{\theta}} + \frac{\alpha(\underline{\theta}+\mu\Delta\theta)}{2(1+2\alpha)\underline{\theta}\overline{\theta}}$.

With perfect information on the employees' productivity, the levels of effort exerted by the employees are not affected by α. But a higher α has a positive impact on wages, i.e. $\frac{\partial\omega_i^{FB}}{\partial\alpha} = \frac{(\underline{\theta}+\mu\Delta\theta)}{2(1+2\alpha)^2\underline{\theta}\overline{\theta}} > 0$ with $i = L, H$. An employee who is envious towards his boss receives a higher wage irrespective of whether he has high or low productive abilities. The boss shares her profits with her employees and α has a negative impact on them. Thus, the presence of envy towards the boss affects the employees' wages even when there is perfect information. In contrast, the presence of envy towards colleagues is inconsequential at this stage of the analysis.

3. Screening problem

When the employees' productivity is their private information, the boss maximizes her profits subject to participation and incentive constraints.

Proposition 2 illustrates the optimal contract:

Proposition 2. *With asymmetric information on the employees' productivity,*

- *required levels of effort are:* $e_L^{SB} = \frac{(1-\mu)(1+\alpha)}{\overline{\theta}(1-\mu)(1+\alpha)+[\beta+\mu(1+\alpha)]\Delta\theta} < e_H^{SB} = \frac{1}{\underline{\theta}}$;
- *wages satisfy the following:*

$$\begin{aligned} \omega_L^{SB} &= \frac{\overline{\theta}}{2}(e_L^{SB})^2 + \frac{\alpha}{1+\alpha}\Pi + \frac{\beta}{2(1+\alpha)}\Delta\theta(e_L^{SB})^2; \\ \omega_H^{SB} &= \frac{\underline{\theta}}{2}(e_H^{SB})^2 + \frac{\alpha}{1+\alpha}\Pi + \frac{\beta}{2(1+\alpha)}\Delta\theta(e_L^{SB})^2 \\ &\quad + \frac{1}{2}\Delta\theta(e_L^{SB})^2. \end{aligned} \tag{4}$$

To better understand the complementarity between these two forms of envy, I start analyzing them separately.

When employees are only envious towards their boss, i.e. $\alpha > 0$ and $\beta = 0$, the levels of effort exerted by the employees are not affected by α:

$$e_L^{SB} = \frac{1-\mu}{\overline{\theta}(1-\mu)+\mu\Delta\theta}; \qquad e_H^{SB} = \frac{1}{\underline{\theta}}.$$

The presence of asymmetric information only leads to an information rent given to the high-productivity employees and a distortion in the level of effort exerted by the low-productivity employees. However, this is the standard distortion observed in an adverse-selection model and is not affected by the presence of envy towards the boss.

When employees are only envious towards their colleagues, i.e. $\alpha = 0$ and $\beta > 0$, β has a negative impact on the effort provided by the low-productivity employees:

$$e_L^{SB} = \frac{1-\mu}{\overline{\theta}(1-\mu)+(\beta+\mu)\Delta\theta}; \qquad e_H^{SB} = \frac{1}{\underline{\theta}}.$$

As β increases so do the material rents paid to both types of employees. The boss has to compensate the low-productivity employees who suffer a utility loss since the high-productivity ones receive an information rent. This gives rise to a material rent which is given to the low-productivity employees. In addition to the information rent, the boss must pay the same material rent

[2] The assumption that employees compare material rents is supported by social psychologists like Adams (1963) and Festinger (1962). They argue that workers desire a fair relation between production costs and income.

[3] There is no renegotiation between the boss and the employees. This assumption allows the employees to compare their rents.

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