Why Do Social Skills Matter?

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Abstract

In this paper I propose a model in which the social skills of a manager signal the workers that their effort is productive. In this model firms with a high productivity of effort hire a socially skilled manager and pay higher wages, and workers hired by these firms exert higher effort. The average level of the social skills acquired by a society is generically inefficient. Viewed in a broader context, the paper argues that the employees are compensated with a higher wage and better working conditions for higher levels of effort.

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1 INTRODUCTION

To achieve a success in today’s world with its emphasis on collaboration, team work, motivation, and leadership one needs to develop interpersonal skills. This maxim is widely appreciated by the practitioners, and numerous seminars and courses teach the techniques for improvement of the general and specific types of social skills. Popular books on social skills development become best-sellers (e. g., Carnegie 1970). However, the economic literature that incorporates social skills into a formal model is quite meager. Why is it important for a manager to show an appreciation of a subordinate’s work, rather then simply provide him with an incentive contract? If the acquisition of social skills is costly, should anybody invest in them at all?

The most obvious answer to the question “Why do social skills matter?” is that employees value them. If this is the case then hiring a manager with a high level of social skills can be considered as creating good working conditions for an employee. This will allow firms to pay lower wages, which may be profitable. This explanation, however, does not account for the increased productivity of workers as a result of a better supervision. That this is indeed a case was indicated in a numerous labor relations studies.

Feldman (1937), for example, reports an experimental study in an insur-
ancial industry. Management of an insurance company effected a general shift of all section heads, involving a transfer of those who had been in charge of above-the-average bonus groups to below-the-average sections. In spite of the reassignment to new sections, those section heads who stood high before the shift remained at the top of the list after it. Since the financial incentives remained the same and there were no shifts of other personnel except for the section heads across sections, these results cannot be attributed to different incentive schemes used by section heads or by self-selection of workers on the basis of an unobserved ability. Other studies in this area were conducted by Likert (1947) and Katz (1951) with similar results. Viteles (1954) provides a detailed description of these studies and concludes that “the attitudes and behavior of the first line supervisor are important factors in determining the productivity of a work group.”

One explanation of the findings reported in the previous paragraph is to assume that the workers act of reciprocity. The idea that the reciprocal behavior may have important economic consequences was advocated by Fehr and Gächter (2000). Another explanation is that high social skills of a manager signal the worker that the marginal product of her effort is high and induce her to exert a higher level of effort. In this paper I will be a
model that formalizes the last explanation. We will also see that the model generates predictions, which are different from those generated by a model of reciprocity and hence, can be differentiated from it empirically. For example, while the model of reciprocity will predict that the effort is continuously increasing with the improvement of working conditions, the current model will predict that it is piecewise constant and increases with jumps.

The basic model is rather simple. Assume that the firm’s expected profits depend upon the technical expertise of the manager and the worker’s effort. The marginal product of worker’s effort is different across the firms and is not observable by the worker. The manager’s social skills signal the worker the marginal product of her effort, and hence induces her to exert higher effort in equilibrium.

To simplify exposition I make two extreme assumptions. First, I assume that social skills are unproductive per se. Second, I assume that they are perfectly anticorrelated with the technical expertise. The last assumption can be justified by postulating that a fixed amount of time should be divided between acquisition of the technical and social skills. Think, for example, of a situation where a future manager fulfilled the basic course requirements of a business school and has to choose an elective, which will improve either her
social or her technical skills.

I will show that, under certain assumptions on the parameters of the model, there exists a separating equilibrium in which the effort sensitive firms hire socially skilled managers and the effort insensitive firms hire technically skilled manages. In a general equilibrium, the fraction of managers who invest in social skills equals the fraction of firms with high marginal product of effort. The resulting level of social skills accumulated by the society will be generically inefficient.

In my model, the firms have full bargaining power in devising contracts, so both the workers and the managers in equilibrium receive utility equal to their reservation level. In particular, this means that neither kind of managers is better off. However, if an unexpected technological change raising the marginal product of effort suddenly occurs, (such a change is consistent with a skilled-biased technological progress, which also manifests itself in a growing premium on education. See, for example, Berman, Bound, and Stephen 1998) the socially skilled managers will be in a short supply, and will be able to extract economic rents. There exists some causal evidence that this is indeed happening (Fontana, 1990).

It is important to stress that both of the extreme assumptions discussed
above are made for the simplicity of the exposition only, and are not crucial for the main argument. Indeed, as long as technical and social skills are not perfectly correlated, which is probably a generic situation, hiring a manager with high social skills the firm forgoes some profits, and hence sends a credible signal to a worker that her effort has high marginal product. If under some circumstances a sociable manager can be seen as a productive asset (as, for example, in Rotemberg 1994) the model will allow to disentangle the productive value of social skills from their value as a signal.

Note that the model implies a positive correlation between wage and effort. This makes the model is observationally similar to an efficiency wage model. For an overview of the efficiency wage models, see Katz (1986).

2 THE MODEL

Assume there is a hyperfinite\(^3\) number \(N\) of firms and each firm needs a manager and a worker. The population contains \(\theta N\) workers and \(\theta N\) managers, where \(\theta \in R\) and \(\theta > 1\). The last assumption is made to justify con-

\(^3\)For the notion of a hyperfinite number and an introduction the nonstandard analysis see, for example, Albeverio, Fenstad, Høegh-Krohn, and Lindstrom (1986). The assumption that \(N\) is hyperfinite plays no role in the partial equilibrium analysis, but allows to eliminate the aggregate uncertainty in the general equilibrium framework.
centrating on equilibria where workers and managers do not earn any rents, however $\theta$ may be arbitrary close to one, so the equilibrium unemployment rate can be made arbitrary small.

Assume that there two types of managers. A manager is of a technical type if she possesses high technical skills and low social skills, and of a social type if she possesses high social and low technical skills. The type of a manager is publicly observable. Direct contribution of a manager to the profits of a firm equals her level of technical skills $\gamma \in \{\gamma_L, \gamma_H\}$; $\gamma_H \geq \gamma_L$. The reservation salary of a manager is $s$ irrespectively of her type. It will be endogenized later. A contribution to the profits (output) of a worker who exerts effort $e$ is

$$\Pi = \beta e + \varepsilon,$$  \hspace{1cm} (1)

where $\varepsilon$ is normally distributed with zero mean and variance $\sigma^2$. The marginal value of effort is $\beta$, $\beta \in \{\beta_L, \beta_H\}$, $\beta_H \geq \beta_L$. There are $\kappa N$ firms with $\beta = \beta_H$, where $\kappa \in R$ and $\kappa \leq 1$. I will say that a firm is effort-sensitive if $\beta = \beta_H$ and is effort-insensitive otherwise.

Workers do not know $\beta$. They, however, observe the manager’s type. The firm can observe the manager’s type and the output produced by the
worker. The worker’s utility is given by:

\[ U(w, e) = 1 - \exp(-\phi(w - \frac{e^2}{2})) \]  \hspace{1cm} (2)

where \( w \) is the workers’s payment (wage) conditioned on \( e \) through \( \Pi \). Note that the utility (2) implies that workers have no direct preferences for the type of the manager.

2.1 PARTIAL EQUILIBRIUM ANALYSIS

In this subsection I assume that all human capital investment decisions have been made already and the proportion of managers of social type is \( q \) such that \( q \geq \kappa/\theta \) and \( 1 - q \geq (1 - \kappa)/\theta \). I will solve for \( q \) in the next subsection where the human capital decision of an individual is endogenized.

The game unfolds as follows. The firm selects a type of manager it wants to hire and offers her a salary. It also offers an incentive contract to a worker. I restrict the set of possible incentive contracts to be affine in the worker’s output. I will refer to a contract

\[ w = \alpha_i \Pi + \delta_i. \]
as $(\alpha, \delta)$ contact. The manager decides whether to accept or to reject the offer. If the offer is accepted the worker observes the type of the manager and the incentive contract and chooses the effort. Then the uncertainty over output is resolved and the payoffs are realized.

The equilibrium concept we are going to use is that of the Perfect Bayesian Equilibrium (PBE). A PBE consists of the firm’s decision on what type of the manager to hire and how much to pay her and what contract to propose to the worker, the manager’s decision of whether to accept the firm’s offer, the worker’s decision whether to accept the contract, what effort to exert if the contract is accepted, and her belief about the firm’s type. All the actions are rational given the beliefs, and the beliefs are consistent with the equilibrium strategy.

Let $s(\beta, t)$ denote the salary a manager of type $t$ earns on a firm of type $\beta$. The following result is an immediate corollary of the definition.

**Proposition 1** In any PBE with a positive employment $s = \overline{s}$.

As any signalling game, this game possesses a continuum of PBEs. Below, I will restrict my attention to a subset of the equilibria in which the firms’s type is revealed in the equilibrium and the workers earn zero rents. Let $p(\alpha, \delta, t)$ be the probability that a worker, who is given an $(\alpha, \delta)$ contract
and observes a \( t \)-type manager, assigns to the firm being effort-sensitive.

**Definition 1** A PBE is called separating if \( p(\alpha(\beta_H), \delta(\beta_H), t(\beta_H)) = 1 \) and \( p(\alpha(\beta_L), \delta(\beta_L), t(\beta_L)) = 0 \).

Rent a worker earns from a contract are defined as:

\[
V(\alpha, \beta_L, \delta, e) = EU(\Pi, e|\beta = \beta_L). 
\]

**Definition 2** A PBE is called a zero-rent equilibrium if \( V(\alpha, \beta_L, \delta; e) = 0 \).

Define a function

\[
H(x, y) = \frac{y^2(\phi \sigma^2(2x - 1) + 2xy^2 - y^2 + 2y - 2)}{2(\phi \sigma^2 + y^2)}. 
\]

As I will show below, \( H(x, y) \) can be interpreted as the profit a firm of type \( y \) earns under the optimal incentive contract, provided the worker believes its type is \( x \).

**Assumption 1**

\[
H(\beta_L, \beta_L) < H(\beta_H, \beta_L). 
\]

This assumption states that we cannot expect firms to reveal their type
truthfully unless they engage in a costly signalling. Formally, the following result holds.

**Proposition 2** Let Assumption 1 be satisfied and $\gamma_H = \gamma_L = \gamma$. Then there exists no separating zero-rent equilibrium.

**Proof.** Assume that such a separating equilibrium exists. Since there is no necessity to induce any effort on the part of the manager, she will always get the salary $\bar{\pi}$. The worker, on the other hand, will face an incentive contract. In the equilibrium the worker knows the marginal product of her effort. Given the assumptions on the worker’s preferences and noise, it can be shown (Holmström and Milgrom, 1991) that the firm of type $\beta \in \{\beta_L, \beta_H\}$ will maximize the total certainty equivalent (TCE)

$$TCE = e - \frac{e^2}{2} - \frac{\phi e^2 \sigma^2}{2\beta_i^2}. \quad (3)$$

The optimal effort is then given by

$$e = \frac{\beta_i^2}{\phi \sigma^2 + \beta_i^2}. \quad (4)$$

It can be implemented by an affine contract
\[ w = \alpha_i \Pi + \delta_i \]  

with

\[ \alpha_i = \frac{\beta_i}{\phi \sigma^2 + \beta_i^2}, \quad \delta_i = \frac{\beta_i (\phi \sigma^2 + \beta_i^2 - 2 \beta_i)}{\phi \sigma^2 + \beta_i^2} \]  

where \( \delta \) is determined by the requirement that the workers earn zero rents. It is straightforward to check that the profits net of wages for a firm of type \( \beta_i \) are given by

\[ H(\beta_i, \beta_i) + \gamma - \bar{\pi}. \]  

However, if an effort-insensitive firm deviates and offers the same contract as a effort-sensitive its profit will be \( H(\beta_H, \beta_L) - \bar{\pi} \). Hence, under Assumption 1, there exists a profitable deviation and a separating equilibrium does not exist.

Q. E. D.

By continuity, Proposition 2 still holds if \( \gamma_H \) only slightly exceeds \( \gamma_L \). This implies that for a separating zero-rent equilibrium to exist it should be sufficiently costly for a firm to hire a socially skilled manager, so only firms
with high marginal product of effort will select this option. That is there exists a threshold level $\gamma^*$ such that for a zero-rent separating equilibrium to exist $\gamma_H - \gamma_L$ should be at least $\gamma^*$.

**Assumption 2**

$$\gamma_L + H(\beta_H, \beta_H) > \gamma_H + H(\beta_L, \beta_H)$$
$$\gamma_H + H(\beta_L, \beta_L) > \gamma_L + H(\beta_H, \beta_L).$$

Assumption 2 states that the technical expertise of a manager is valuable enough. Hence, only the effort sensitive firms will be willing to hire a manager with a low level of technical expertise for the sake of increasing effort.

**Proposition 3** Assume that Assumption 2 is satisfied. Then there exists a separating zero-rent equilibrium, in which the socially skilled managers are employed by the effort sensitive firms and the technically skilled managers are employed effort insensitive firms. The workers assign probability one of them being at an effort-sensitive firm if the manager is of the social type, and probability zero otherwise. They face an incentive contract

$$w_i = \alpha_i \Pi + \delta_i$$  \hspace{1cm} (8)

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with

\[ \alpha_i = \frac{\beta_i}{\phi \sigma^2 + \beta_i^2}, \delta_i = \frac{\beta_i(\phi \sigma^2 + \beta_i^2 - 2 \beta_i)}{\phi \sigma^2 + \beta_i^2} \]  

(9)

and exert effort

\[ e = \frac{\beta_i^2}{\phi \sigma^2 + \beta_i^2}. \]  

(10)

Proof. First, assume that managers of social type are employed by the effort sensitive firm and managers of technical type are employed by the effort insensitive ones. Then, on the equilibrium path, workers should assign probability one of them being on an effort sensitive firm if the manager is of social type, and probability zero otherwise. Hence, in the equilibrium, the worker knows the type of the firm and the firm faces a standard principal-agent problem. Again, a firm of type \( i \) can be assumed to choose the implemented effort by maximizing the TCE

\[ TCE = e - \frac{e^2}{2} - \frac{\phi e^2 \sigma^2}{2 \beta_i^2}. \]  

(11)

Following the same logic as in the proof of Proposition 2, one can verify that the optimal effort is given by (14) and can be implemented by incentive
contract (12)-(13). The net of wages profit of the effort-insensitive firm is given by \( \gamma_H + H(\beta_L, \beta_L) - \pi \), while that of the effort-sensitive firm is given by \( \gamma_L + H(\beta_H, \beta_H) - \pi \). By Assumption 2, these profit levels are incentive compatible.

Q. E. D.

Proposition 3 implies that if there is a sufficiently big differential in technical skills of the two types of managers and a sufficiently big difference in the marginal product of effort across firms, managers with different skills will be hired by the different types of firms. Given that there are more managers than firms and managers are indifferent about what skills to acquire and where to be employed, it can be also assumed that there are enough managers of each type to satisfy the firms’ demands.

In the separating equilibrium described above, beliefs of the workers depend only on the type of the manager, not on the wage contract received. It is the unique separating equilibrium with this property. Note that it is also the only equilibrium which is constraint Pareto efficient and in which workers earn zero rent.
2.2 GENERAL EQUILIBRIUM ANALYSIS

In this subsection I am going to analyze the decision of agents to invest in their human capital. Assume that each moment \(2N\theta\) new individuals are born. The individuals live for two periods. In period one they have to decide whether to acquire any kind of skills at cost \(c\) or to remain unskilled. In period two some of them are hired as workers or managers. Only skilled individuals can become managers. The hired managers earn a salary and workers face an incentive contract that leaves them no rents. It means that an individual is indifferent between becoming a worker and staying unemployed. There is no discounting. Firms maximize their time average profits.

To proceed further we need the following assumption.

**Assumption 3**

\[
\gamma_L + H(\beta_H, \beta_H) > 0 \\
\gamma_H + H(\beta_L, \beta_L) > 0.
\]

Assumption 3 states that both types of firms will prefer to be in business rather than shut down.

**Proposition 4** Let Assumptions 2-3 be satisfied. There exists a symmetric
stationary PBE in which effort sensitive firms hire a socially skilled manager, while effort insensitive firms hire a technically skilled manager. Both types of firms offer a manager a salary

\[ s = \frac{1}{\phi} \ln \frac{1}{1 - \theta + \theta \exp(-\phi c)}. \]  

(12)

Workers are offered an incentive contract described in Proposition 3. If all firms offered a salary no lower then (14) at every date prior to \( t \), each individual acquires high social skills with probability \( \kappa/2 \), acquires technical skills with probability \( (1 - \kappa)/2 \), and acquires no skills at all effort level and beliefs are given by Proposition 3.

**Proof.** First, note that once the human capital investment decisions are made, the contracts offered by the firm and the effort chosen by the workers represent an equilibrium in the resulting subgame due to Proposition 3. To analyze the investment decisions note that a skilled individual is matched with a firm with probability \( 1/\alpha \). If firms offer to a manager a salary \( s \) her expected utility is

\[ \frac{1}{\theta}(1 - \exp(-\phi(s - c))) + (1 - \frac{1}{\theta})(1 - \exp(\phi c)). \]  

(13)
If an individual acquires no skills he gets an expected utility of zero. The salary that makes the individual indifferent between the options is given by (12). Firms never offer a salary higher then (12), since offering salary (12) will be sufficient to induce at least $N$ individuals to invest in skills with at least $\kappa N$ investing in social and at least $(1 - \kappa)N$ in technical skills. They will also never offer a salary below (12) because in this case there will be no skilled labor from the next period on and the time average profits will become zero.

Q. E. D.

Note that as $\phi \to 0$ (12) implies $s/\theta = c$, that is, that expected salary equals the cost of investment in the human capital. Since workers have no direct preferences for the type of the manager and social skills are unproductive, the socially optimal level of the social skills is zero. Hence, the average level of the social skills accumulated by the society is too high. On the other, hand if had workers obtained a direct utility of $v > \gamma_H - \gamma_L$ from a socially skilled manager all managers should have acquired the social skills. In this case, the equilibrium level of the social skills acquired by the society is too

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5Since $N$ is hyperfinite there is no aggregate uncertainty in the model. The law of large numbers holds exactly for hyperfinitely many random variables, i. e. the difference between the sample mean and the expectation is infinitesimal (see, Keisler1978).
low. The only case, when the society acquires the efficient average level of social skills is \( v = \gamma_H - \gamma_L \), which is not generic.

3 DISCUSSION AND CONCLUSIONS

In this paper I developed a model that treats social skills of executive officers as a signalling device. I assumed that, in addition to providing an incentive contract to workers, firms have to signal their type. In this model they do it by choosing the manager’s type. In practice, they may use other signalling strategies. Any arrangement that is provided at a sufficient cost at the firm’s side can serve this purpose. This allows us to look at the results obtained in this paper from a broader perspective and consider them as a contribution into the compensating differentials debate. The idea of compensating differentials, first formulated by Adam Smith (1776/1976), states that individuals have to be compensated for bad working conditions.\(^6\) Despite its plausibility, no empirical support for this idea has been found so far. As noted by Duncan and Stafford (1980) “a positive relation between

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\(^6\)In the model developed in the paper high marginal product of effort is viewed as neither good nor bad working condition. It is also assumed that the manager cannot affect working conditions directly, though having a sociable manager will be, probably, viewed by the workers as a good working condition. For a model in which a manager can affect working conditions directly, see Itoh (1991).
bad working conditions and wages is not typical for cross-sectional analysis.”

On the contrary, a positive correlation between good working conditions and wages is typically observed. This observation led Doeringer and Piore (1982) to formulate a dual labor market hypothesis.

A lack of the empirical evidence for the existence of the compensated differentials typically explained either by unobserved workers’ heterogeneity (Gibbons and Katz 1992, Hwang, Reed, and Hubbard, 1992) or by measurement problems (Hamermesh, 1978). Duncan and Holmud (1983) showed, however, that the problem persisted after they controlled for heterogeneity using panel data. Measurement problems generally will cause the estimate of the magnitude of compensated differentials to be biased downward, but it is unlikely that the effect will completely disappear or even reverse sign.

The model proposed in this paper can explain a positive correlation between wages and good job characteristics in a population of homogeneous workers. Note that even though workers earn different wages in equilibrium they get the same utility. This is because the workers enjoying better working conditions and earning higher wages also exert higher effort in the equilibrium. This feature distinguishes the current model from models with a heterogenous ability, where workers earn rent on their ability. Hence, one
might conclude that, after all the compensating differentials do exist, but instead of compensating by better wages for worse working conditions, workers are compensated by higher wages \textit{and} better working conditions for higher effort.

One can also use the model of the paper to analyze, which of the possible signalling strategies will be chosen by the firm. Indeed, assume that the firm can provide several possible improvements of worker’s condition, hire a nice manager, bye an air-conditioner, provide a flexible working schedule, etc. Let $I$ be a finite set of all possible improvements and let $c_i$ be the cost for the firm of improvement $i$. Then the firm will provide a subset of improvements $M \subset I$ which have minimal possible cost subject to the constraint that it generates a credible signal. This observation can be used to distinguish the behavior described in this paper from a reciprocal behavior. A reciprocal worker will continuously increase effort in response to an improvement in working conditions, while in this model effort is piecewise constant and jumps when improvement cost crosses the threshold.
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