Why Do Social Skills Matter?

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Abstract

In this paper I propose a model where social skills of a manager signal the workers that their e¤ort is productive. In this model ...rms with a high productivity of e¤ort hire a socially skilled manager and pay higher wages, and workers hired by these ...rms exert higher e¤ort. In a broader context, the paper argues the employees are compensated with a higher wage and better working conditions for higher levels of e¤ort.

I. INTRODUCTION

To achieve 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 speci...c types of social skills. Popular books on social skills development become best-sellers [e. g., Carnegie 1970]. However, there exists no economic literature that incorporates social skills into a formal model. Why is it important for a top 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 ...rms to pay lower wages, which may be pro...table. Another possibility is that high social skills of a manager signal the worker that the marginal product of her e¤ort is high and induce her to exert a higher level of e¤ort .

In this paper I develop a model that addresses these issues. I assume that

each ...rm has to hire a manager and a worker. The ...rm's expected pro...ts depend upon the technical expertise of the manager and the worker's e¤ort. Assume that the marginal product of worker's e¤ort is di¤erent across the ...rms and is not observable by the worker. The manager's social skills, being unproductive per se, signal the worker the marginal product of her e¤ort, and hence induces her to exert higher e¤ort in equilibrium. This idea is broadly consistent with the explanation of social psychologists [e. g., Fontana 1990] that show to people and they then work harder.

In order to rationalize such behavior, one has to assume that the social skills of a manager are negatively correlated with her technical expertise. This assumption can be justi...ed by postulating that a ...xed amount of time should be divided between acquisition of the technical skills or the social skills. Think, for example, of a situation where a future manager ful...lled the basic course requirements of a business school and has to choose an elective, which will improve either her social or her technical skills. If technical and social skills of a manager are negatively correlated then hiring a manager with high social skills the ...rm forgoes some pro...ts, and hence sends a credible signal to a worker that his e¤ort has high a marginal product.

I will show that, under certain assumption on the parameters of the

model, there exists a separating equilibrium in which the e¤ort sensitive ...rms hire socially skilled managers and the e¤ort insensitive ...rms hire technically skilled manages. Hence, in a general equilibrium, the fraction of managers who invest in social skills equals the fraction of ...rms with high marginal product of e¤ort. In my model ...rms have full bargaining power in devising contracts, so both the workers and the managers in equilibrium receive utility equal to the their reservation level. In particular, this means that neither kind of managers is better o¤. However, if an unexpected technological change raising the marginal product of e¤ort[1] suddenly occurs the managers with social skills 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].

Note that the model implies a positive correlation between wage and effort. This implies that the model is observationally equivalent to an e¢ciency wage model.[2] The crucial di¤erence between the model developed in this paper and an e¢ciency wage model is that in this model a higher wage does not cause higher e¤ort. Rather they both are caused by the higher marginal

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[1]Such a change is consistent with a skilled-biased technological progress, which also manifests itself in a growing premium on education [Berman, Bound, and Stephen 1998]

[2]For an overview of the e¢ciency wage models, see Katz (1986).

product of e¤ort.

II. THE MODEL

Assume there is a continuum of ...rms with total measure N and each ...rm needs a manager and a worker. The population contains a continuum of workers and a continuum of managers, each with total measure ®N, where ® > 1. The last assumption is made to give ...rms all the bargaining power, however ® 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 pro...ts of a ...rm equals her level of technical skills $° 2 f°_L;$ $°_H g$. The reservation wage of a manager is $\bar{w}$ irrespectively of her type.[3] A contribution to the pro...ts (output) of a worker who exerts e¤ort e is

$$¦ = ¯e + ";$$ (1)

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where " is normally distributed with zero mean and variance $\frac{3}{4}^2$. The marginal

value of e¤ort, $^-$ 2 f^-_L; ^-_Hg. There are · N ...rms with $^-$ = ^-_H, where · · 1.

I will refer to ...rms with $^-$ = ^-_H as e¤ort responsive ...rms.

Workers do not know $^-$. They, however, observe the type of manager.

The ...rm can observe the type of manager and the output produced by worker.

The worker's utility is given by:

$$U(w; e) = 1 \textrm{ ¡ } \exp(\textrm{¡ } Á(w \textrm{ ¡ } \frac{e^2}{2})) \qquad (2)$$

where w is the agent's payment (wage) conditioned on e through ¦ .

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 type with a high

level of social skills is q such that q ¸ · =® and 1 ¡ q ¸ (1 ¡ ·)=®.[4] I will

analyze the structure of the contracts o¤ered at this stage.

The game unfolds as follows. The ...rm selects a type of manager it wants

to hire and o¤ers her a wage. It also o¤ers an incentive contract to a worker.

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[4] If the human capital decision of an individual is endogenized one can solve for q.

I restrict the set of possible incentive contracts to be a¢ne in the worker's output. The manager decides whether to accept or reject the o¤er. If the o¤er is accepted the worker observes the type of the manager and the incentive contract and chooses the e¤ort. Then the uncertainty over output is resolved and the payo¤s are realized.

The equilibrium concept we are going to use is that of the Perfect Bayesian Equilibrium (PBE). Let $t \in \{S, T\}$ denote the type of the manager, and de...ne $a(t) : \{S, T\} \to \{0, 1\}$ by $a(t) = 1$ if and only if a manager of type t accepts the ...rm's o¤er. De...ne a binary variable b to be equal to one if and only if the worker accepts the job. De...ne $V(®; ¯; ±; e) = EU(® \bar{\ }_H e + ®" + ±; e)$.

De...nition 1 $(t(\bar{\ }); w(\bar{\ }); ®(\bar{\ }); ±(\bar{\ }); a(t); b(®; ±; t); p(®; ±; t))$ constitute

a PBE if

1. $a(t) = 1$ if and only if $w \geq \overline{w}$

2. $e \in \arg\max(pV(®; \bar{\ }_H; ±; e) + (1 - p)V(®; \bar{\ }_L; ±; e))$

3. $b = 1$ if and only if

$$\max_e (pV(®; \bar{\ }_H; ±; e) + (1 - p)V(®; \bar{\ }_L; ±; e)) \geq 0 \qquad (3)$$

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4. $(t(\bar{}); w(\bar{}); \circledR(\bar{}); \pm(\bar{}))$ solve

$$\max(\bar{}(1 - \circledR)e - \pm - w) \tag{4}$$

$$s{:}t{:}\ a(t) = 1; b = 1; \tag{5}$$

$$e \in \arg\max(pV(\circledR; \bar{}_H; \pm; e) + (1 - p)V(\circledR; \bar{}_L; \pm; e)){:} \tag{6}$$

5. $p(\cent)$ is calculated using Bayes rule whenever possible.

In words, a PBE consists of a ...rm's decision on what type of manager to hire and how much to pay her and what contract to propose to the worker, manager's decision of whether to accept the ...rm's o¤er, worker's decision whether to accept the contract, what e¤ort to exert if the contract is accepted, and his belief about the ...rm's type. The de...nition of a PBE demands that all the actions are rational given the beliefs, and the beliefs are consistent with the equilibrium strategy. The following result is an immediate corollary of the de...nition.

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

Below I will be interesting in equilibria where the ...rms's type is revealed in equilibrium.

De...nition 2 A PBE is called separating if $p(\circledR(\bar{}_H); \pm(\bar{}_H); t(\bar{}_H)) = 1$ and

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$p(\circledR(\bar{}_L); \pm(\bar{}_L); t(\bar{}_L)) = 0.$

De...ne a function

$$H(x; y) = \frac{y^2(\acute{A}\frac{3}{4}^2(2x \mathbf{i} 1) + 2xy^2 \mathbf{i} y^2 + 2y \mathbf{i} 2)}{2(\acute{A}\frac{3}{4}^2 + y^2)}:$$

Assumption 1 $H(\bar{}_L; \bar{}_L) < H(\bar{}_H; \bar{}_L).$

Let us ...rst assume that all managers have the same technical exper-
tise. Then a separating equilibrium does not exist. I formalize this result in
Proposition 2.

Proposition 2 Let Assumption 1 be satis...ed and $\circ_H = \circ_L = \circ$. Then a
separating equilibrium does not exist.

Proof of Proposition 2. Assume that a separating equilibrium exists.
Since there is no necessity to induce any e¤ort on the part of the manager,
she will always get the wage $\bar{w}$. The worker, on the order hand, will face
an incentive contract. In the equilibrium the worker knows the marginal
product of his e¤ort. Given the assumptions on the worker's preferences and
noise, it can be shown (Holmström and Milgrom, 1991) that the ...rm of type
$\bar{}\ 2\ f\bar{}_L; \bar{}_H g$ will maximize the total certainty equivalent (TCE)

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$$TCE = e \; \textbf{¡} \; \frac{e^2}{2} \; \textbf{¡} \; \frac{\text{Á}e^2\text{¾}^2}{2^{-2}_i}:$$
(7)

The optimal e¤ort is then given by

$$e = \frac{^{-2}_i}{\text{Á¾}^2 + {}^{-2}_i}:$$
(8)

It can be implemented by an a¢ne contract

$$w = {}^{®}\text{¦} + \pm$$
(9)

with

$$^{®} = \frac{^{-}_i}{\text{Á¾}^2 + {}^{-2}_i}; \quad \pm = \frac{^{-}_i(\text{Á¾}^2 + {}^{-2}_i \; \text{¡} \; 2^{-}_i)}{\text{Á¾}^2 + {}^{-2}_i}:$$
(10)

It is straightforward to check that the pro...ts net of wages for a ...rm of type

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$\bar{}_i$ are given by

$$E(\lrcorner_i \mid w) = H(\bar{}_i; \bar{}_i) + {}^\circ_i \quad \overline{w}: \qquad (11)$$

However, if the ...rm with low marginal product of e¤ort deviates and o¤ers the same contract as a ...rm with a high marginal product of e¤ort its pro...t will be $H(\bar{}_H; \bar{}_L) \ ¡ \ \overline{w}$ Hence, under Assumption 1, there exists a pro...table deviation and a separating equilibrium does not exist.

Q. E. D.

By continuity, Proposition 2 still holds if ${}^\circ_H$ only slightly exceeds ${}^\circ_L$. This implies that for a separating equilibrium to exist it should be su¢ciently costly for a ...rm to hire a socially skilled manager, so only ...rms with high marginal product of e¤ort will select this option.

Assumption 2

$${}^\circ_L + H(\bar{}_H; \bar{}_H) \ > \ {}^\circ_H + H(\bar{}_L; \bar{}_H)$$

$${}^\circ_H + H(\bar{}_L; \bar{}_L) \ > \ {}^\circ_L + H(\bar{}_H; \bar{}_L):$$

Assumption 2 states that the technical expertise of a manager is valuable

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enough. Hence only the e¤ort sensitive ...rms will be willing to hire a manager with a low level of technical expertise for the sake of increasing e¤ort.

Proposition 3 Assume that Assumption 2 is satis...ed. Then there exists a separating equilibrium in which the managers of the social type are employed by the e¤ort sensitive ...rms, the managers of the technical type are employed by the e¤ort insensitive ...rms. Workers assign probability one of them being at an e¤ort sensitive ...rm if the manager is of the social type, and probability zero otherwise. They face an incentive contract

$$w_i = {}^{\circledR}_i \dfrac{}{} + \pm_i \tag{12}$$

with

$$^{\circledR} = \frac{^{-}_i}{\acute{A}\frac{3}{4}^2 + {}^{-2}_i}; \pm = \frac{^{-}_i(\acute{A}\frac{3}{4}^2 + {}^{-2}_i \ \ 2^{-}_i)}{\acute{A}\frac{3}{4}^2 + {}^{-2}_i} \tag{13}$$

and exert e¤ort

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$$e = \frac{\bar{\sigma}_i^2}{\acute{A}\sigma^2 + \bar{\sigma}_i^2}: \tag{14}$$

 Proof of Proposition 3. First, assume that managers of social type are employed by the e¤ort sensitive ...rm and managers of technical type are employed by the e¤ort insensitive ones. Then, on the equilibrium path, workers should assign probability one of them being on an e¤ort sensitive ...rm if the manager is of social type, and probability zero otherwise. Hence, in the equilibrium , the worker knows the type of ...rm and the ...rm faces a standard principal-agent problem. Again, n a ...rm of type i can be assumed to choose the implemented e¤ort by maximizing TCE

$$TCE = e \; \text{¡} \; \frac{e^2}{2} \; \text{¡} \; \frac{\acute{A}e^2\sigma^2}{2\bar{\sigma}_i^2}: \tag{15}$$

Following the same logic as in the proof of Proposition 2, one can verify that the optimal e¤ort is given by (10) and can be implemented by incentive contract (8)-(9). The net of wages pro...t of the e¤ort insensitive ...rm is given by $°_H + H(\bar{}_L; \bar{}_L)$ ¡ $\overline{w}$, while the pro...t of the e¤ort sensitive ...rm is given

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by $\pi_L + H(\bar{}_H; \bar{}_H) \mathrel{¡} \bar{w}.$ By Assumption 2 these pro...t levels are incentive compatible.

Q. E. D.

Proposition 3 implies that if there is a su¢ciently big di¤erential in technical skills of the two types of managers and a su¢ciently big di¤erence in the marginal product of e¤ort across ...rms, managers with di¤erent skills will be hired by the di¤erent types of ...rms. Given that there are more managers than ...rms and managers are indi¤erent 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 ...rms' 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 e¢cient and in which workers earn zero rent.

2. General Equilibrium Analysis.

In this subsection I am going to analyze the decision of agents to invest in human capital. 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. The hired manages earn a salary and workers face an incentive contract that leaves them no rents. There is no discounting. Firms maximize their time average pro...ts. Assume that at each moment new agents with a measure $2N\circledR$ are born.

To proceed further we need the following assumption.

Assumption 3

$$\circ_L + H(\bar{}_H; \bar{}_H) \; > \; 0$$

$$\circ_H + H(\bar{}_L; \bar{}_L) \; > \; 0:$$

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

Proposition 3 Let Assumptions 2-3 be satis...ed. There exists a symmetric stationary sequential equilibrium in which e¤ort sensitive ...rms hire a manager with high social skills, while e¤ort insensitive ...rms hire a manager with a low social skills. Both types of ...rms o¤er a manager a salary

$$w = \frac{1}{\bar{A}} \ln \frac{1}{1 \; \text{¡} \; \circledR + \circledR \exp(\text{¡} \; \acute{A}c)}: \tag{16}$$

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Workers are o¤ered an incentive contract described in Proposition 3. If almost all ...rms o¤ered a salary no lower then (14) at every date prior to t, each individual acquires high social skills with probability $·/2$, acquires technical skills with probability $(1 ¡ ·)/2$, and acquires no skills at all with probability $1/2$, otherwise nobody invests in any skills. Workers' e¤ort level and beliefs are given by Proposition 3.

 Proof of Proposition 4. First, note that once the human capital investment decisions are made contracts o¤ered by the ...rm and the e¤ort chosen by the workers represent an equilibrium in this subgame due to Proposition 3. To analyze the investment decisions note that a skilled individual is matched with a ...rm with probability $1/®$. If ...rms o¤er to a manager a salary w her expected utility is

$$\frac{1}{®}(1 ¡ \exp(¡ Á(w ¡ c))) + (1 ¡ \frac{1}{®})(1 ¡ \exp(Ác)). \tag{17}$$

If an individual acquires no skills he gets expected utility zero. The wage that makes the individual indi¤erent between the options is given by (14). Firms never o¤er a salary higher then (14), since o¤ering salary (14) will be

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su¢cient to induce at least N individuals to invest in skills with at least $\cdot$ N investing in social and at least $(1 \ ¡ \ \cdot)N$ in technical skills. They will also never o¤er a salary below (14) because in this case there will be no skilled labor from the next period on and the time average pro...ts will become zero.

Q. E. D.

Note that as Á ! 0 (14) implies w = ®c, that is, that expected salary equals the cost of investment in the human capital.

III. DISCUSSION AND CONCLUSIONS

In this paper I developed a model where workers did not know the marginal product of their e¤ort. Hence, in addition to providing an incentive contract the ...rms have to signal their type. In this model they do it choosing what type of manager to hire. In practice they may use other signalling devices. Any arrangement that is provided at a su¢cient cost at the ...rm's side can serve this purpose.

The discussion in the previous paragraph allows us to look at the results obtained in this paper from a broader perspective and consider them as a contribution into the compensating di¤erentials debate. The idea of compensating di¤erentials, ...rst formulated by Adam Smith [1776/1976], states

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that individuals have to be compensated for bad working conditions. Despite its plausibility, no empirical support for this idea has been found so far. As noted by Duncan and Sta¤ord [1980] "a positive relation between 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 empirical evidence is 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 di¤erentials to be biased downward, but it is unlikely that the e¤ect 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 di¤erent wages in equilibrium they get the same utility. This is because the workers enjoying better working

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conditions and earning higher wages also exert higher e¤ort in equilibrium. This distinguishes this model from models with heterogenous ability, where workers earn rent on their ability. Hence, one might conclude that after all the compensating di¤erentials do exist, but instead of compensating by better wages for worse working conditions, workers are compensated by higher wages and better working conditions for higher e¤ort.

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