Self Dealing and Optimal Compensation

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Abstract

We present a self-dealing model with two layers of moral hazard where a manager acts simultaneously as an agent for an investor and as a principal to the employees of a firm. We find that if the proportion of discretionary funds available to the manager is within a specific range, he can be made to forego his private benefit and instead use it to incentivize exertion of effort outside regular working contracts. The model offers a plausible mechanism that relates self-dealing to the emergence of different forms of corporate governance across the world.

Keywords: corporate governance; two-layered moral hazard; social norms

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1 Introduction

International and even regional differences in corporate governance persist despite years of integration in global financial markets, sustained direct investment, and increasing instances of global supply chains. While there are several potential explanations for such differences, it stands to reason that variations in social and legal environments have important implications for the traditional principal-agent model of optimal compensation in corporate finance. This paper proposes a simple framework within which differences in the environment could lead to tolerance of alternative norms for compensation, taking into account the potential for self-dealing in different contracting environments. This is done through explicitly modeling the potential role of stakeholders other than the shareholders and top management of the firm.

The main novelty of this paper lies in its new treatment of self-dealing. In contract theory, self-dealing is usually treated exclusively as a problem and the aim is to minimise it. Here we show that explicitly modelling the incentives alongside potential variation in stakeholder behavior leads to alternative conclusions. Specifically, there are situations where it may instead be Pareto optimal to encourage the manager to apply their discretion to spending funds to incentivize stakeholders by giving them a higher "stake" in the firm's success. In order to consider stakeholder characteristics in determining an optimal compensation scheme, we apply a two layered principal-agent model. The investor (a principal) determines the compenstaion of the manager (his agent) by adjusting for the trade-offs faced by the manager (in his role as a principal) in disbursing resources towards the firm's other stakeholders (agents). These stakeholders may be internal (employees) or external (local politicians, other institutions). We are agnostic about the specific actions of different types of stakeholders, instead demonstrating the usefulness of this two-layered framework in as simple a way as possible.

From a theory perspective, the starting point of this analysis is Tirole (2006). He classifies the corporate governance literature into four strands based on how the management might not act in the owner's best interests: "insufficient effort", "extravagant investment" which refers to the problem of empire building, "entrenchment strategies" or actions that hurt the owners but secure top executives in their position and last but not least, "self dealing" when "managers may increase their private benefit from running the firm by engaging in a wide variety of self dealing activities." These are all essentially moral hazard problems that arise due to the uncontractibility of all the manager's actions, leaving them with varying levels of access to discretionary funds. We focus on self-dealing, which is traditionally solved by compensating the manager sufficiently conditional on success so that they no longer have an

incentive to misallocate the discretionary funds available to them .

The corporate governance literature has analyzed self-dealing through several examples: excessive compensation, managerial perquisites, transfer pricing or self-serving financial transactions such as personal loans to insiders, or even theft of corporate assets. Berle and Means (1932) and Jensen and Meckling (1976) look at managerial consumption of perquisites due to lack of separation of ownership and control, while Baumol (1959) and Jensen (1986) analyze over-investment by management. The ability of the management to divert corporate wealth is discussed in Grossman and Hart (1988), Hart (1995) and Zingales (1994). Many corporate finance studies however, look at self dealing as a consequence of concentrated ownership with negative effects on control. Morck, Wolfenzon, and Yeung (2005) have provided a survey on this topic. This paper is not exclusively motivated by the existence of different degrees of separation of ownership and control, but generally by the ability of the manager to divert the company's funds.

Managers have different degrees of access to uncontractible amounts due to several factors. For instance, firms operate in different environments with different shareholder protection laws. Additionally, the size of firms and the dispersion of their share ownership would lead to varying degrees of oversight. Finally, the nature of the firm's activity may not allow the investor to contract every possible action e.g. research labs. Thus the existence and size of discretionary funds can be interpreted as being characteristic to the nature of the project or environment or both.

The manager may legally disburse funds under his discretionary control in a variety of ways. He may, for instance, pay higher than the typical market compensation and perquisites to himself. Alternatively, he may pay higher wages to his workers, spend on better working conditions for firm's employees, also on business infrastructure (e.g. research facilities), societal infratructure (e.g. sports facilities and schools), offer sponsorship of social activities or specific benefits for employees (office canteens, gyms, nurseries). In return for sharing his private benefits, the manager creates a work environment which fosters social cooperation and overall higher efficiency from all the participants in the firm.

By sharing what we call the 'private benefit' the manager creates a work environment inducive of social interactions where the firm could achieve higher efficiencies. Bandiera, Barankay and Rasul (2007, 2009, 2011) look at work environments with high level of social interactions (fruit farms in the UK) and confirm that working with friends could affect one's individual productivity within a firm. In the same spirit of social interactions, Mas and Moretti (2009) empirically demonstrate that individuals are motivated by social relations and mutual monitoring, suggesting that working in a supportive environment can induce effort, when economic mechanisms are limited.

Our model consists of two levels of moral hazard. The investor cannot contract the amount of discretionary funds the manager shares with the workers. Secondly, the manager cannot observe the actual exerted effort and must condition payment on the basis of an observed outcome. Here, we can see that the manager acts both as an agent and as a principal simultaneously in two different subgames. It is necessary to model this extra layer to recognize the existence of an environment consisting of agents whose actions have an impact on the success of the firm.[1]

In terms of determining the optimal compensation, we consider this in the standard sense of the well-known principal agent problems that arise from asymmetric information. However, the optimal contracts will be set at two levels: investor - manager level and manager - employees level. The managerial compensation consists of a conditional wage on the success of the venture. However the manager will also have access to an uncontractible amount at his discretion and hence he can use parts of it as a private benefit. The employees get a common social benefit as a share of the uncontractible amount, optimally determined by the manager when the project succeeds. This incentive scheme, captures the reciprocity between firms and workers detailed by Fehr, Gachter, and Kirchsteiger (1997) or Fehr, Kirchsteiger, and Riedl (1998). They experimentally evidenced that workers anticipate firms' reciprocal behavior and, could shirk more or less based on this anticipation. As a result, firms may induce effort levels above the incentive compatible level when reciprocical behaviour is accounted for. Rabin (1993) was the first to introduce the concept of "reciprocal behavior" by showing that interactions of reciprocally motivated agents could induce Pareto superior outcomes to those resulted from selfish behavior. In line with the reciprocal behavior concept, in this paper the effort made by the employees due to a shared social benefit is not interpreted as normal to the regular working contract but due to the anticipation of social benefits offered by the firm.

We choose to model self-dealing as a two-layered moral hazard as there is already empirical evidence that managers may fail to follow shareholders' objectives not only in order to pursue their own enrichment, but also to pursue the interests of the other employees of the firm. Bertrand and Mullainathan (2003) show that when the corporate governance mechanisms

[1] This paper is an extension of the standard principal agent model to two layers of moral hazard with the manager being both an agent for the investor and a principal for the employees. This is different from double moral hazard problem where two economic actors are engaged in a joint production.The double moral hazard problem was identified, defined and further analysed by Lafontaine (1992), Romano (1994), Bhattacharya and Lafontaine (1995), Maruyama, (2003) and represents a situation where the manager is both shareholder and agent and thus reacting to two-sided incentives. This issue was captured in different settings such as franchising relationships by Mathewson and Winter (1985), Lal (1990), Roberts (1996), Lal, Park, and Kim (2000), or more generally in vertical integration. Articles that have surveyed the theories of vertical integration are Holmstrom and Roberts (1998), Whinston (2003), Gibbons (2005), and Lafontaine and Slade (2007)

like take-over threats have a limited effect, the managers act both in their own interest and in the interest of the workers: once a law that limits the threat of take-overs is introduced average blue collar wage increases.

In this model we shows that when the uncontractible amounts available to the manager are below an optimally determined level, the manager will choose to disburse all available funds to the employees as a social benefit, so that the project has higher chances of success. However, if the discretionary amount is above this threshold, the manager will start distributing a lower share to the employees. In this case both the optimal managerial compensation and the employees' benefit will decrease with respect to the level of discretionary amounts while the manager will keep a higher share as a private benefit. This result implies that when more of the investment takes an uncontractible form, the greater the disparity in earnings of the manager vis à vis the benefits shared with employees will, be and hence their income inequality.

While the general scope of this paper is to identify situations where and if self dealing is beneficial to the firm at a more practical level we try to look for ways in which the management is made to foster beneficial social relations within the firm. Granovetter (1973, 1985) developed the idea that economic activities are embedded in social structures and weak social ties are beneficial to work environments. An important characteristic of social embeddedness is the fact that firms not only use the social environment in which they act for their advantage, but that they go further and create a social structure in order to achieve their scope. Such a link is important because it helps us view the firm as a key element in building social networks, communities and ultimately growth.

This new way of modeling self-dealing also allows us to understand the emergence of different corporate governance system across the world. We argue that not only the availability of uncontractible funds but also the cost of exerting effort in the form of different regional social characteristics are determinants in choosing different optimal organizational structures. We interpret the cost of effort by the employees as due to fundamental differences between societies, such as culture or social norms.

The model provides several testable implications. One such question is whether higher managerial control over funds due to less strict self dealing regulations results in higher benefits shared with the workers. Further, do countries with high level of social interactions but with strict self dealing regulations, experience more corporate social responsibility activity? Empirical evidence related to our line of inquiry is found by Cline and Williamson (2016), who document a clear substitutability relation between trust and anti-self dealing regulations. Building on earlier empirical work that shows a clear positive relationship between trust and economic and financial development (e.g., Knack and Keefer, 1997; Zak and Knack, 2001;

Guiso et al., 2004; Tabellini, 2010; Algan and Cahuc, 2010), they show that. countries with high level of anonymous social trust experience higher financial market development even at less stricter anti self-dealing formal regulations.

The next section sets up and solves the theoretical model of self dealing as a double layer moral hazard. Section 4 concludes.

2 The Model

2.1 The environment

An investor invests I in a project. The project has a verifiable rate of return r at the end of the period if the project is successful and the investor loses all the investment if the project fails. The investor hires a manager to run the business, but he cannot write a complete management contract due to the complex nature of the project. As Tirole (2006) puts it there are in general four ways in which the management may not act in the owner's best interest: insufficient effort, extravagant investment, entrenchment strategies and self dealing. These are all fundamentally issues of moral hazard problem and there are situations in which firms could face at least two or three of these issues, however for this model tractability reasons will consider only the last one: self dealing.

Self dealing problem in this model takes the form of an amount $B < I$ available to the manager but not contractible for a specific task which the manager may choose to spend on his personal welfare or any other discretionary project. The manager has access to this uncontractible amount B either because the firm operates in different environments with different shareholder protection laws, or the size of the firm is large with many but small shareholders, or the structure of the firm gives high powers to CEOs. It could also be the case that the nature of the activity does not allow the investor to contract every possible action, for example research labs. Thus B can be interpreted as being characteristic to the nature of the project/firm or environment or both. The manager may legally disburse funds under his discretionary control for several different reasons. He may, for instance, pay higher than the typical market compensation and perquisites to himself. Alternatively, he may spend on better work conditions and higher wages for firm's employees (Lenovo's CEO Yang Yuanqing shared $3.25 million of his bonus in 2013 with his employees), but also on infrastructure (both productive and social), e.g. research facilities, sponsorship of social activities both for employees (canteens, gyms, nurseries).

Providing exceptional work environment triggers a reciprocal behavior from the employees. This extra effort is not ex-ante observable and hence not contractible.

This first level of moral hazard between the investor and the manager is very similar to that employed in Tirole (2001) and Holmstron and Tirole (1997). In these studies, however the manager was compensated for not using B as private benefit, while in this model the manager will have incentive to use the funds for optimally involving the firm's employees in the success of the project.[2]

The manager, thus has the ability to commit to share a portion of this amount B, labelled B^E, with other the employees. In turn, this payment will compensate for exerting higher effort N at cost $c(N)$. The project is successful with probability $p(N)$ and fails with probability $1-p(N)$. The remaining part of B not shared with the employees will be used by the manager for his own private enjoyment. The right share of managerial private benefit B_p and employees' benefit B^E will be determined optimally. The manager will face a trade-off between higher probability of success (implying a higher expected wage) combined with a lower private benefit (due to higher B^E) and the combination of lower expected wage with higher private benefit.

The employees' effort is unobservable, hence uncontractible. If the project is successful the manager will be paid a wage w and the manager will pay the employees B^E while the remaining part of B, B_p will remain with the manager. If the project fails the manager gets zero wage, does not pay anything and keeps the whole B to himself. The minimum wage set to zero corresponds to allowing a limited liability constraint on the manager.

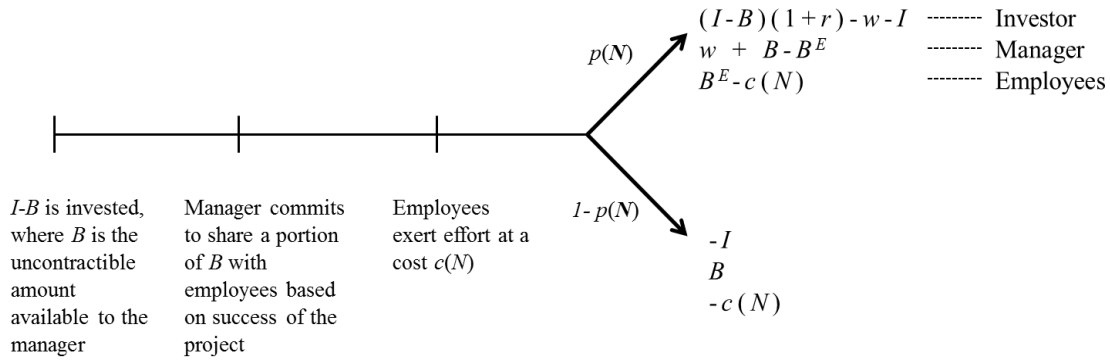
This type of incentive set-up has been lately employed by different corporations in order to attract the employees for the firm's success. One of the latest example is the case of the insurance company Prudential Financial which announced in February 2014 that 44,000 of its employees who do not normally participate in equity compensation programs will receive a $1,300 bonus for helping the company to attain its profitability goal ("Prudential Workers Get $57 Million as CEO Beats Target," Bloomberg News Feb. 6, 2014). Regarding this action John Nadel, an analyst at Sterne Agee and Leach commented that: "rewarding the general, non-executive-management, is a smart move [..] and has to go a long way towards further solidifying morale and loyalty."

[2] Tirole (2001) models self-dealing in a very simple way: the manager has to decide whether to use firm's resources for private benefit. If the manager uses B for investment the project suceeds with probability p_H, if he uses B for personal enjoyment the project suceeds with a lower probability p_L. Thus, in order to make the manager not to use these resources for private benefit the investor compensates him more in case of success than in case of failure.With risk neutrality, it is optimal for the manager to receive 0 in case of failure and some compensation w in case of success but B is foregone. That is, the net expected managerial payoff of this scheme (i.e. the reduction $p_H - p_L$, in the probability of success times the reward in case of success, w) must outweigh the private benefit B. The optimal executive compensation thus is set at $\frac{B}{p_H - p_L}$ and the investor's net payoff is $p_H \left(I(1+r) - \frac{B}{p_H - p_L} \right) - I$.

Our model consists of two levels of moral hazard. First, the investor cannot contract the amount of discretionary funds the manager will share with the workers. Second, the manager cannot observe the actual amount of effort exerted by the employees and must condition payment on the basis of an observed outcome. Here, we can see that the manager acts both as an agent and as a principal simultaneously in two different subgames; it is necessary to model this extra layer to recognize the existence an environment consisting of agents whose actions will have an impact on the success of the firm.

The set-up is a three players model with an investor, a manager and the employees of the firm and I restrain myself from issues of moral hazard in teams.

Model Scheme



The total effort of the employees determines a particular probability of success $p(N)$. This probability function $p(N)$ could be scaled up by a constant p in order to capture the success of the project when no effort is exerted, but without loss of generality we set this constant to zero. The effort is exerted at a cost $c(N)$.

We assume a quadratic and separable cost of effort $c(N) = m\frac{(N)^2}{2}$ and a linear and increasing probability of success $p(N) = N$.

The parameter m could be interpreted as a social indicator representing the ease of exerting exceptional effort by the employees. This could be specific to the employee in terms of training, abilities or specific to the firm, or the industry. At a more general level the cost of effort could be characteristics to different geographic community and could be due to different education systems, literacy, cultural paths, social norms, ethnicity or even past patterns of migration

The investor, in this model, in turn, will maximize his expected return by setting a wage for the manager that increases his incentive to offer more to the employees. The game has a Stackelberg timing.

2.2 Optimal Contracts

2.2.1 First Best

First, I will look at the first best case where both the amount available to the manager B and the effort level are contractible. The optimal effort is straightforward to calculate:

$$N^* = \arg\max_N N\left[I\left(1+r\right)\right] - I - m\frac{\left(N\right)^2}{2} \tag{1}$$

with first order conditions:

$$\frac{I\left(1+r\right)}{m} = N^* \tag{2}$$

In this case the manager is left with nothing at his discretion and the investors contract the employees. However the compensation offered to the employees has no allocative rule. The employees receive a constant minimum pay in all states of the world, which makes them exert effort. This case however is hypothetical only as the investor has no executive role in the firm.

Next, we look at the allocative role of the contracts (when both B and N are not contractible) so that both the manager and the investor achieve the highest possible payoffs. In this process, the employees achieve also higher than otherwise possible expected payoffs.

2.2.2 Second Best (B and N non-contractible)

First level of moral hazard

The investor's optimal contracting problem under moral hazard:

$$\max_w N\left[\left(I-B\right)\left(1+r\right)-w\right] - I \tag{3}$$

subject to:

1. Individual rationality constraint for the manager:

$$\left(1-N\right)B + N\left(w+B-B^E\right) \geq \bar{u} \text{ or} \tag{4}$$

$$B + N\left(w-B^E\right) \geq \bar{u} \tag{5}$$

This constraint introduces the labor market conditions in our model. The manager' outside option is $\bar{u}$ and in a buoyant labor market $\bar{u}$ is high. Thus the manager's expected net payoff needs to be higher than the exit option. In a pessimistic labor market the manager's outside options are low so the compensations are set at lower levels as well.

2. *The second level of moral hazard* or the incentive compatibility constraint for the

manager.

The manager maximizes his expected payoff by offering to the employees a share of his private benefit $B^E \leq B$ as a payment towards their effort. Thus, the manager's - who is the principal in this case - optimal contracting problem under moral hazard is:

$$\max_{B^E} (1-N)\, B + N\left(w + B - B^E\right) \text{ or} \tag{6}$$

$$\max_{B^E} B + N\left(w - B^E\right) \tag{7}$$

subject to:

1. availability of funds constraint as the manager cannot distribute more than he has to the employees:

$$B^E \leq B$$

2. limited liability constraint for the employees:

$$B^E \geq 0$$

3. participation constraints for the employees which imposes that the net expected benefit of the employees is positive:

$$NB^E - m\frac{(N)^2}{2} \geq 0$$

4. incentive compatibility constraint for the employees which states that the effort exerted maximize their private payoff net of their cost of effort:

$$\max_{N} NB^E - m\frac{(N)^2}{2}$$

This second level of moral hazard reflects the relation between the amount the manager decides to share with the employees and his monetary benefits which take two forms: a part of the unaccounted cash, $B - B^E$ and a wage earned when the project is successful. Basically, here the incentive scheme implemented compensates the manger more at success which in turn motivates the manager to distribute more out the discretionary amount for increasing this enterprise's success. Through this incentive scheme, the manager effectively says: I will forgo a part of sure B in the favour of my employees if the investor will compensate me more when the project is realized.

Below I summarize the solution of this double level of moral hazard problem. Detailed profs are in the appendix. There are different values for the optimal contracts $\left(\bar{w}, \bar{B}_p\right)$ and $\left(\bar{B}^E, \bar{N}\right)$ based on different levels of uncontractible amounts available to the manager B and various level of market conditions reflected in the social characteristic m and outside option

for the manager $\bar{u}$. Essentially the results are tabulated in two tables.

In Table 1. we look at a situation where the amount available to the manager is relatively low and $B \leq \frac{I(1+r)}{4+(1+r)}$.

This corresponds to a situation in which the availability of funds constraint in the second level of moral hazard fails at the optimal of choice parameters. In this case the manager disburses all the funds available to him towards the employees while his private benefit is zero. We further split this case into two separate market conditions:a regular labor market where the individual rationality constraint is satisfied and the managerial compensation is determined optimally through the incentive compatibility scheme. And a buoyant labor market conditions where the manager's individual rationality makes the investor to offer him a higher than otherwise optimal compensation so that he stays with the firm.

$B \leq \frac{I(1+r)}{4+(1+r)}$: Manager disburses all B		
	IR satisfied	IR binds
	$\bar{u} \leq \frac{4B^2+B}{2m}$	$\bar{u} > \frac{4B^2+B}{2m}$
N	$\frac{B}{m}$	$\frac{B}{m}$
B^E	B	B
B^P	0	0
w	$2B$	$\sqrt{2m\left(\bar{u}-B\right)}$
Π	$\frac{B}{m}\left[\left(I-B\right)\left(1+r\right)-2B\right]-I$	$\frac{B}{m}\left[\left(I-B\right)\left(1+r\right)-\sqrt{2m\left(\bar{u}-B\right)}\right]-I$

We see that within this incentive structure, all managerial private benefit is sacrificed for increasing the success of the project. This further translates in maximum level of effort exerted by the employees as they receive all the private benefit and a managerial compensation equal with double the uncontractible amount available in the firm.

In terms of comparative statics, if the uncontractible amount - B - available to the manager is small, by increasing it, more effort is exerted; as a result employees' benefit is higher. The managerial private benefit is set at zero but the managerial optimal compensation increases with B. This incentive scheme basically sets-up an uncertain higher bonus for forgoing a certain private benefit. Also, if the cost of effort due to social characteristics of employees is low the chances of success of the project in turn are high and the investor has a higher payoff. The employees benefit and managerial wage are unaffected and set at the maximum level B and $2B$ respectively. This cost of effort acts also as a mitigator between the firm and the manager as at low values, the chances that the manager's payoff hits his outside option bound are low and it is less likely that he will leave the firm.

It is also important to realize that this incentive scheme could results in Pareto superior outcomes to those resulted from a simple self-dealing selfish behavior as described in Tirole

(2001). In Tirole's model the investors sets a conditional managerial wage at $\frac{B}{p_H - p_L}$ where the $p_H - p_L$ is the difference in probability of success of the project when the manager doesn't uses B up as private benefit versus when he does. Hence the manager is incentivized to use B up for investment and not for private enjoyment. Investor's net payoff in this case is $p_H \left(I(1+r) - \frac{B}{p_H - p_L} \right) - I$ and the employees do not share in any of the uncontractible amounts.

One could easily assume that probability of success of the project with employees participation is higher than without ($\frac{B}{m} > p_H$) and further that the manager does not use up B for private benefit if expropriation has a dramatic effect in project's success, i.e. $p_H - p_L < \frac{1}{2}$. Under these (non-restrictive) assumptions, our model (with IR binding) offers Pareto superior outcomes as all three participants: investor, manager and employees have higher overall outcomes.

In Table 2. the amount available to the manager is relatively high and $B > \frac{I(1+r)}{4+(1+r)}$. Again we look at two different market conditions, when the managerial' individual rational constraint is satisfied or not.

$B > \frac{I(1+r)}{4+(1+r)}$: Manager does not disburse all B		
	IR satisfied	IR binds
	$8m\bar{u} \leq \left[(I-B)(1+r)\right]^2 + 8mB$	$8m\bar{u} > \left[(I-B)(1+r)\right]^2 + 8mB$
N	$\frac{[(I-B)(1+r)]}{4m}$	$\sqrt{\frac{(\bar{u}-B)}{2m}}$
B^E	$\frac{[(I-B)(1+r)]}{4}$	$\sqrt{\frac{m(\bar{u}-B)}{2}}$
B^P	$B - \frac{[(I-B)(1+r)]}{4}$	$B - \sqrt{\frac{m(\bar{u}-B)}{2}}$
w	$\frac{[(I-B)(1+r)]}{2}$	$\sqrt{2m(\bar{u}-B)}$
Π	$\frac{[(I-B)(1+r)]^2}{8m} - I$	$\sqrt{\frac{(\bar{u}-B)}{2m}} \left[(I-B)(1+r) - \sqrt{2m(\bar{u}-B)} \right] - I$

If the amount available to the manager is above a threshold, he will start distributing a lower share to the employees. In this case both the wage and the employees' benefit decrease with B while the private benefit increases with B.

This result suggests that, when B exceeds a minimum threshold, increasing B leads to a disparity in earnings of the manager vis à vis the benefits shared with employees- i.e. when more of the investment takes an uncontractible form, the greater the inequality will be. The wage is set at lower levels but the manager is compensated with higher personal benefit. In other words, beyond a certain level, the existence of B can no longer be exploited to incentivize the manager. This high uncontractibility of B could be due to the nature of the ownership of the firm (small and dispersed shareholders are less likely to get involved in the activity of the manager), or even due to the nature of firm's activity for example R&D centers

where it is not possible to contract due to the uncertainty of the activity. It may also be an outcome of the legal environment, where regulations for accounting disclosure are either less stringent or are poorly enforced or even the structure of the firm where CEOs hold great executive powers. In this case, the investor might wish to design different incentive schemes such that the manager uses the entire discretionary amount B to complement the existing investment instead of sharing it with the employees or keeping for his own use respectively. This would be just a simple model of moral hazard in which the manager's wage is set at high enough levels such that he has no incentives to deter B from investment as in Tirole (2001).

It appears from this simplified example that the level of uncontractible amount available to the manager and employees' cost of exerting effort are important factors in determining the optimal nature of contract for the manager. Designing incentive schemes ignoring the social structure in which the company operates (which the existing literature has done so far) might result however in inefficient allocation of resources than otherwise feasible. This is due not only to the inability of using all the available resources but also to the design of wrong incentives offered to the manager in the form of inappropriate compensation which is too high to incentivize him to look for alternative sources of increasing profitability.

3 Conclusion

In the contract theory literature, self dealing is described as a circumstance where a manager has access to uncontractible resources and needs therefore to be compensated for not expropriating funds from the company. In a simple theoretical model we extend this approach by considering the existence of an extra organizational layer: the employees. The employees could increase the chance of success of the project by receiving parts of the available resources. Our results offer an incentive scheme (optimal managerial compensation) through which the manager is made to share the discretionary resources with the employees. In this context, self-dealing thus loses the negative connotation from the current contracts literature as the manager shares the private benefits for increasing the overall efficiency.

To a more practical end, this paper offers a basic policy framework for transnational corporations in terms of setting the appropriate ratio of managerial wage to managerial slack based on the location of activity (in terms of the interplay between anti self-dealing regulations and social norms). In other words heterogeneity in legal and cultures differences should play a central role in determining the governance mechanisms and wage contracts offered by investors. While this model brings a new view on self-dealing, we do not detach ourselves from the conventional investor protection mechanism but we look at means of

improving them when different legal and cultural conditions are present.

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4 Appendix

4.1 Proof of the results in section 3

We solve for the optimal contract by backward induction.

The incentive compatibility constraint for the employees, or the employees' maximization problem is:

$$\max_{N} NB^E - m\frac{(N)^2}{2}$$

with first order condition: $\bar{N}\left(B^E\right) = \frac{B^E}{m}$.

For this value of effort the participation constraint of the employees is always satisfied as at the optimum level of effort their net payoff becomes $\frac{\left(B^E\right)^2}{2m}$which is positive for any $m > 0$.

Moving on to the next level of optimization, the manager's decision problem becomes:

$$\max_{B^E}\left[B + \frac{B^E}{m}\left(w - B^E\right)\right]$$

with maximum managerial payoff satisfied at $\bar{B}^E(w) = \frac{w}{2}$. This result shows that there is a positive relation between manager's wage and the employees' compensation.

There are two remaining constraints to be satisfied at the optimum level of compensation for the employees:

- limited liability constraint for the employees: $\bar{B}^E(w) \geq 0$ or $\frac{w}{2} \geq 0$ which is satisfied for any positive wage, and
- availability of funds constraint: $\bar{B}^E(w) \leq B$ or $w \leq 2B$ which depends on the level of w. At the corner when $\bar{B}^E(w) = B$, the wage needs to be constraint at $2B$ such that the positive relation between B^E and w remains preserved.

Next we look at the investor maximization problem which becomes:

$$\max_{w} \frac{w}{2m}\left[(I - B)(1 + r) - w\right] - I$$

The optimum level of managerial wage (in the case of an interior solution) hence is:

$$\bar{w} = \frac{\left[(I - B)(1 + r)\right]}{2}$$

which determines in turn the optimal level of employees' compensation, the managerial

private benefit and the effort exerted

$$\begin{aligned}\bar{B}^E &= \frac{[(I-B)(1+r)]}{4} \\ \bar{B}^p &= B - \frac{[(I-B)(1+r)]}{4} \\ N &= \frac{[(I-B)(1+r)]}{4m}\end{aligned}$$

There are two final constraints that need to be verified at the optimal level of managerial compensation are:

1. the availability of funds constraint: $\bar{B}^E(\bar{w}) \leq B$ or $\bar{w} \leq 2B$. In order to have indeed an interior solution for $\bar{B}^E$ then $\frac{[(I-B)(1+r)]}{2} < 2B$ or

$$B > \frac{I(1+r)}{4+(1+r)}$$

When $\bar{B}^E(\bar{w}) \geq B$ or $B \leq \frac{I(1+r)}{4+(1+r)}$, the optimal employees' compensation is limited at the maximum amount available to the manager$\bar{B}^E = B$. In this case the optimum wage becomes $2B$.

2. the individual rationality (IR)constraint of the manager at optimum level of wage becomes:

$$B + \frac{\bar{w}^2}{2m} \geq \bar{u}$$

or

$$\bar{w} \geq \sqrt{2m(\bar{u}-B)}$$

For an interior solution for $\bar{B}^E$ (the condition 1 above is satisfied) manager's IR constraint becomes:

$$[(I-B)(1+r)]^2 \geq 8m(\bar{u}-B)$$

or

$$8m\bar{u} \leq [(I-B)(1+r)]^2 + 8mB$$

For a corner solution $\bar{B}^E = B$ (the condition 1 above is fails) manager's IR constraint becomes:

$$\begin{aligned}2B &\geq \sqrt{2m(\bar{u}-B)} \text{ or} \\ m\bar{u} &\leq \frac{4B^2+B}{2}\end{aligned}$$

Summarising all these results:

a. If both of these conditions are satisfied :

$$\begin{aligned} N &= \frac{[(I-B)(1+r)]}{4m} \\ B^E &= \frac{[(I-B)(1+r)]}{4} \\ B^p &= B - \frac{[(I-B)(1+r)]}{4} \\ w &= \frac{[(I-B)(1+r)]}{2} \\ \Pi &= \frac{[(I-B)(1+r)]^2}{8m} - I \end{aligned}$$

b. If availability if funds constraint binds or $B < \frac{I(1+r)}{4+(1+r)}$ but condition 2 (manager' s IR constraint) is satisfied, or $m\bar{u} \leq \frac{4B^2+B}{2}$ then:

$$\begin{aligned} N &= \frac{B}{m} \\ B^E &= B \\ B^P &= 0 \\ w &= 2B \\ \Pi &= \frac{B}{m}[(I-B)(1+r) - 2B] - I \end{aligned}$$

c. If availability if funds constraint binds or $B < \frac{I(1+r)}{4+(1+r)}$ and condition 2 is not satisfied (manager's IR constraint binds) or $m\bar{u} > \frac{4B^2+B}{2}$, then:

$$\begin{aligned} N &= \frac{B}{m} \\ B^E &= B \\ B^P &= 0 \\ w &= \sqrt{2m(\bar{u}-B)} \\ \Pi &= \frac{B}{m}[(I-B)(1+r) - 2B] - I \end{aligned}$$

d. If condition 1 is satisfied or $B \geq \frac{I(1+r)}{4+(1+r)}$ and condition 2 failscondition 2 is not satisfied (manager's IR constraint binds) then:

$$
\begin{aligned}
N &= \sqrt{\frac{(\bar{u}-B)}{2m}} \\
B^E &= \sqrt{\frac{m\,(\bar{u}-B)}{2}} \\
B^P &= B - \sqrt{\frac{m\,(\bar{u}-B)}{2}} \\
w &= \sqrt{2m\,(\bar{u}-B)} \\
\Pi &= \sqrt{\frac{(\bar{u}-B)}{2m}}\left[(I-B)\,(1+r) - \sqrt{2m\,(\bar{u}-B)}\right] - I
\end{aligned}
$$