Organizational Culture and Monetary Incentives:

Management Practices in an Identity-Based Principal-Agent Framework

Abstract

Firms make costly investments in organizational culture that provide no pecuniary incentives. Building on the idea in Akerlof and Kranton (2005) that these investments strengthen employee identification, this paper presents an identity-based principal-agent model that addresses the open questions of 1) why not all firms make such investments and 2) how these investments interact with monetary incentives of various intensities. When the firm invests, it is shown that organizational culture and monetary incentives could be substitutes or complements. The latter case fits the previously unexplained observation of companies that combine such investments with strong monetary incentives. The model also yields four testable predictions about conditions under which organizations are more likely to invest.

1 Introduction

> *"There is all the difference imaginable between the grudging distrustful, half-forced cooperation and the eager, whole-hearted, vigorous, happy cooperation of men working together for a common purpose"*
>
> – James F. Lincoln's Observation on Management, Fast and Berg (1975)

Modern management practices aimed at improving employee motivation extend well beyond monetary incentives. For example, Lincoln Electric, an American multi-national that manufactures welding products, invested in installing large stainless steel letters to spell the company motto that stretched 30 feet across the wall at the entrance to its plant and offices. Trice and Beyer (1984) and Alvesson (2002) document the widespread management practice of organizing office Christmas parties, annual picnic and anniversary celebrations[1], and suggest these activities are "identity-facilitating". To establish "culture unlike any in corporate America", Google provides complete gourmet meal for its employees three times a day, and installed lava lamps and large rubber balls around its offices (Edelman and Eisenmann, 2010). In Huajian, a Chinese factory in Ethiopia that manufactures designer shoes, both Ethiopian and Chinese workers participate in morning training, marching, and singing the "Song of Huajian" in Chinese[2](Hamlin and Davison, 2014). To the extent these investments and activities across sectors and countries are intended to provide employee motivation, they present a puzzle for standard models where workers are only motivated by pecuniary rewards.

Akerlof and Kranton (2005) offers a promising approach to explain this phenomenon by suggesting that *identity* - a person's sense of self - can be an additional source of motivation. The paper introduces two identities within the firm, *insiders* who "identify with the goals of the firm" and *outsiders* who do not. These identities differ in their associated *ideals,* the way a person should behave, with insiders assumed to adopt higher ideal effort as they "act in the interest of the firm". Therefore, the costly investments and activities are used to establish an organizational culture where workers become insiders who internalize higher

[1]For example, Enator, a Swedish computer consultancy company, supported regular activities including a chorus, art club and navigation course that took place in the corporate building outside Stockholm, and financed outdoor activities such as hiking, sailing, and diving every third month in its various units.

[2]Slogans followed: "Unite as one." "Improvement together." "Civilized and efficient." Inside the factory, slogans such as "Absolute Concentration" and "Punctuality is Integrity" cover the walls in English, Chinese and Amharic.

ideals[3], potentially leading to higher performance (and fitting the second group in Lincoln's observation). This paper extends the existing model to address two related questions that naturally follow - if these practices are effective and often easy to imitate, why are they not adopted by all firms[4]? Moreover, how do firms combine investment in organizational culture with monetary incentive of various intensities? Huajian, for example, combines its non-productive activities with the use of strong monetary incentives. Similarly, Lincoln Electric has employed an Incentive Performance System since the early twentieth century (Fast and Berg, 1975). On the other hand, other organizations including non-profit combine motivation by identity with low-powered incentives. In the extreme case of the Brazilian manufacturer Semco, workers face no monetary incentives and are allowed to choose their own salaries (Charness et al., 2012). Akerlof and Kranton (2005) abstracts from the first and provides only a partial answer to the second question.

In a principal-agent framework, this paper presents a theoretical model that incorporates identity to address why some firms invest in organizational culture and how it interacts with monetary incentives. Key innovations to Akerlof and Kranton (2005) are twofold. We first relax the binary effort assumption and allow continuous effort. With this set-up, we then allow for monetary incentives to interact with the worker's perception of ideal effort as called for by her identity. While there is a substantial line of research on how incentives may affect psychological motivations (modelled, for example, in Benabou and Tirole, 2003), models of identity have so far assumed away an interaction between incentives and identity ideals. We discuss two plausible mechanisms, signalling and peer effect, through which a higher level of incentives could interact positively with identity-related motivations. For example, investments in organizational culture bring workers closer together as a group and thereby amplify peer effects; those who have adopted the insider identity care more about other people within the firm and are more conscious of contributing their part to the team. Therefore, when incentives are raised, insiders more readily adjust their effort ideals upwards to keep up with their peers. In the analysis, we first capture the resulting positive interaction in a reduced form way without modelling the aforementioned mechanisms explicitly by assuming a positive effect of incentives on the effort ideal.

[3]This definition of organizational culture is closely linked with previous definitions. In the business context, for example, Camerer and Vepsalainen (1988) defines corporate culture as "a set of broad, tacitly understood rules which tell employees what to do under a wide variety of unimaginable circumstances". Under the identity-based framework, this definition can be summarized as the ideal behaviour, and therefore we consider *organizational culture* as the *insider identity* within the firm and use these two terms synonymously.

[4]Bloom and Van Reenen (2010), for example, documents substantial variations in management practices across firms and countries.

Under the assumption that investments instill insider identity, we show that investments in organizational culture and monetary incentives are not necessarily substitutes. This contrasts with the result of Akerlof and Kranton (2005) that these practices are always substitutes, and could fit the observation of Lincoln Electric where the firm combines strong monetary incentives and organizational culture. When outsiders internalize minimum effort as ideal and the firm has limited influence over the ideal adopted by insiders, it is optimal to combine these management practices, as either one alone would not be effective in motivating workers. On the other hand, if the firm could ensure the adoption of a high effort ideal by insiders, then the two management practices are seen as substitutes - the firm can induce optimal effort through investment in organizational culture, using only low-powered monetary incentives. The model also predicts situations in which the organization is more likely to invest in culture: when the outsider culture is to significantly underperform, when cost of establishing organizational culture is low, and/or when the firm can foster a hardworking insider culture.

One extension considers heterogeneity in agents' outsider identity. This would correspond to a situation in which some workers come from a culture of underperforming but others come from a culture of high motivation. In this case, we derive the fourth condition for the firm to be more likely to invest: when facing heterogeneous agents, there is a larger gain from investing in organizational culture than in the case of homogenous agents. This could fit evidence in Bloom and Van Reenen (2010) that multinational corporations (MNCs) often transport their management practices abroad - not only might they have a lower cost of implementation, they also reap greater benefit from introducing insider culture as they are likely to have hired from a range of professional and cultural backgrounds.

In another extension we solve the model allowing effort ideal to be fully endogenous, where the firm has total influence over the ideal adopted by insiders. The firm is shown to always ensure the adoption of a high ideal by insiders; therefore in this case, investments in organizational culture and monetary incentives are always substitutes. To weaken the strong assumption made on functional form of the ideal effort, we provide an extension of the model in which the ideal effort is determined endogenously through peer effect. We show that organizational culture and monetary incentives are again substitutes if we assume culture simply increases the ideal level of effort; however, if culture had an effect on the responsiveness to identity of agents, then organizational culture and monetary incentives

are complements for low and substitutes for high ideal levels.

Finally, we discuss the implications of the reverse condition where incentives have a negative effect on effort ideals. This is not likely under the existing set-up where signalling and peer effect lead to a positive dependency, but could arise if alternative mechanisms become relevant. The role identity plays remains unchanged – insiders are inclined to perceive incentives more positively (or less negatively) and react in the way intended by management. Therefore, even under the reverse condition, similar results follow as the benefit of investing in insider culture relative to outsider culture stays the same.

The rest of the paper is organized as follows. Section 2 reviews related literature. Section 3 introduces the model, extending Akerlof and Kranton (2005) to continuous effort. Section 4 details the main idea of the paper, exploring pay-dependency of effort ideals. The subsequent sections discuss comparative statics, and several extensions including heterogeneous agents and endogenous ideals. Section 8 concludes and outlines avenues for future research.

2 Related Literature

This paper builds on the identity framework developed by Akerlof and Kranton (2005). To incorporate the notion of identity[5], Akerlof and Kranton (2005) describes a principal-agent model where agents' utility depends on their identities, leading them to behave more or less in line with the goals of their organization. Two identities are possible in the baseline model: that of an insider who internalizes the principal's values and that of an outsider who does not. The identity of an agent becomes relevant to the principal's economic decisions through the effort ideal, which dictates how a person should behave. For example, insiders, understanding better and caring more about firm's goals, set higher effort as their ideal. As agents experience disutility when their behaviour departs from the ideal for their particular identity, insiders are more likely to exert high effort. Therefore, firms have incentive to make identity investments and establish organizational culture to change the identity of their workers from outsiders to insiders.

The agent's utility function (3.1) in our model closely follows that of Akerlof and Kranton (2005). It incorporates utility or disutility derived from four sources: utility from income, disutility from cost of effort, utility from belonging to an identity category, and disutility

[5]Akerlof and Kranton (2010) discusses the relevance of identity in various other settings, both in and outside of the workplace. Both papers mentioned follow the seminal work Akerlof and Kranton (2000), which considers how identity, a person's sense of self, affects economic outcomes.

from divergence between actual effort and the effort ideal for a given identity. With a standard hidden action set-up, Akerlof and Kranton (2005) describes a situation where effort and output are both binary and only output is observed. Risk-averse agents can choose either the high effort action A or the low effort action B, with A leading to higher probability of high output. The effort ideals for both insiders and outsiders are independent of monetary incentives and set to action A for insiders and action B for outsiders. Because of their higher ideal, insiders are more likely to undertake action A; therefore, the power of incentives is lower for insiders, implying the use of identity investment as a substitute for monetary compensation. With its binary effort and exogenous ideal assumptions, this model is a useful framework but offers an overly blunt account of the interplay of management practices. It fails to fit the observation of Huajian or Lincoln Electric where firms combine investment in corporate culture and strong monetary incentives.

Alternative models that incorporate non-monetary motives could explain the implementation of corporate culture. Ramalingam and Rauh (2010) constructs a model where agents experience guilt when their action falls short of the work ethic chosen by the principal. Here firms operate with only corporate culture and without any monetary incentives, therefore the model provides no insight into the interaction of the two. Kosfeld and von Siemens (2011) assumes that workers differ in their social preferences. While selfish workers respond only to monetary incentives and conditionally cooperative workers derive intrinsic satisfaction from mutual cooperation, the model shows that a separating equilibrium in which workers sort into firms of different culture and incentive intensities always exists. Incentive and corporate culture are again substitutes - firms can attract cooperative agents by inducing a corporate culture of teamwork and offering weak incentives. Unfortunately, these non-identity based models also struggle to explain the apparent complementarity of monetary incentives and identity investments.

To overcome these shortcomings, we consider an extension of Akerlof and Kranton (2005) that incorporates the psychological effect of incentives[6]. More precisely, we assume a positive effect of incentives on effort ideals. With exogenous effort ideals and an additive separable utility function in monetary and identity terms, Akerlof and Kranton (2005) considers only

[6]Several experiments show evidence for the psychological effect of incentives. Gneezy and Rustichini (2000) provides experimental evidence for the non-monotonicity of incentives, where offering incentives proves to be negative relative to no incentives, but larger amount yields a higher performance. In a field experiment where students are hired for data entry, Kvaloy et al. (2015) finds an increase in performance only when combining performance pay and motivational talk. This suggests possible interaction of the psychological effects of monetary and non-monetary incentives, as they each alone have negative or no effect on performance.

the psychological effect of identity and does not include that of incentives. To incorporate the positive psychological effect of incentives into the identity-based framework[7] and make sense of this non-standard assumption, we consider two plausible mechanisms through which the effect could take place - signalling and peer effect - and the role identity plays. Signalling closely follows the idea of Benabou and Tirole (2003), in which the agent takes the choice of incentives as a signal from the privately informed principal. Specifically, workers might take a high level of incentives as a signal of a high value of the task to the principal and thus adopt a high effort ideal. Therefore, higher incentives not only provide extrinsic motivation but also signal the firm's preference for higher effort. Upon receiving the signal, agents of all identities adjust their effort ideals accordingly, but their degrees of internalization differ; insiders more readily adjust their ideals upwards as they care more about the firm and its goals.

Depending on what they signal about the principal's information, incentives could also have a negative psychological effect. This may happen, as modelled in Benabou and Tirole (2003), if incentives signal boring task or low ability of the agent. We consider the negative pay-dependency of effort ideals and its implications as a part of robustness checks.

Peer effect is another mechanism through which incentives could have a psychological effect. This relates to the theoretical work of Kandel and Lazear (1992) on partnerships, which shows that peer effect could mitigate the free-rider problem through norms, mutual monitoring, and psychological costs. The relevance of peer effect in the workplace has also been documented in empirical studies, both in lab and field experiments such as in Mas and Moretti (2009), Falk and Ichino (2006) and Kaur et al. (2010), and survey in the case of Ichino and Maggi (2000). These studies provide evidence that people try to conform to the effort of their peers.

Incentive pay could increase the effort ideal through its influence on the agent's peers if the agent adopts as ideal the average effort of her peers (or a function that incorporates peer effect). Concerned with keeping up with others, an agent will adjust ideal effort upwards when incentives are raised[8]. Insiders, caring about the company and their coworkers, are more concerned with keeping a positive image and would not fall behind their peers. There-

[7] The relevance of identity has been shown in other context. Masella et al. (2012) conducts field experiment to show that control by someone from the in-group is perceived more negatively than otherwise. This suggests identity plays a role in psychological effect of the cost of control.

[8] This assumes agent believes that others will respond positively to incentives - she has no reason to believe otherwise under the current set-up. The principal will not raise incentives if it has an adverse effect on effort of all workers.

fore, facing a stronger peer effect, insiders internalize effort ideals that are more responsive to monetary incentives.

3 Exogenous Effort Ideals

This section introduces the identity-based principal-agent framework and explores its implications in two benchmark cases. In Akerlof and Kranton (2005), effort is assumed to be binary and not observable, with effort ideals exogenous and independent of the incentive pay set by P. Here we relax the first assumption from binary to continuous effort in a model with no hidden action. This set-up allows us to examine the interplay of management practices in the simplest model possible and easily incorporate the pay-dependency of effort ideals in Section 4.

3.1 Set-up

We consider a simple principal-agent model where the principal contracts with a single agent. The timing of the events is as follows:

1) Worker (A) with known ability (c) is hired.

2) Firm (P) decides whether to establish organizational culture, through an identity investment at fixed cost F>0. As in standard models, P also chooses fixed pay α and incentive pay β.

3a) If an identity investment is made, the worker chooses identity (d) to adopt and optimal effort (e) to exert. In this simple model, the worker faces a binary choice for identity $d \in \{O, N\}$ where O = outsider identity and N = insider identity. Effort is continuous and positive, $e \in [0, \bar{e}]$, where $\bar{e}$ is the maximum effort possible.

b) If identity investment is not made, the worker stays as an outsider (d = O) and chooses only the effort e to exert.

4) The firm observes effort and pays worker $\beta e + \alpha$.

In this setting, if P makes an identity investment (3a), then A has the choice to become an insider. As efforts are observable, P could induce a particular level of effort e through only monetary incentives, or combine it with identity investment if it is a more profitable option. This set-up without hidden action allows us to easily incorporate the psychological

effect of incentives and examine the interplay of management practices in the simplest model possible[9].

If no identity investment is made (3b), A faces no identity choice and stays an outsider. This scenario can also be interpreted as P adopting the outsider culture within the firm, and therefore making outsider and insider identities equivalent. Even though A chooses only effort here, identity is still relevant. The level of effort chosen and thus the monetary incentives offered depend on the outsider identity.

We assume a linear contract as in existing models. This is the simplest contract possible that includes both incentive and fixed pay components and in practice is easy to understand and implement.

3.2 Agent's Problem

The utility function of the worker is characterized as:

$$U = \alpha + \beta e - C(e) + I_d - \frac{t_d}{2}[e^*(d) - e]^2 \tag{3.1}$$

where

α = fixed pay: wage/fixed salary

β = incentive pay: piece rate/bonus

$C(e)$ = cost of effort: a weakly increasing, convex function of effort e (so $C'(e) \geq 0$ and $C''(e) \geq 0$)

I_d = intrinsic value of identity d: values of insider and outsider identities I_N and I_o are assumed to be fixed and known to both P and A.

$e^*(d)$ = ideal effort level for identity d

t_d = responsiveness to ideal level for a chosen identity d: $t_d \geq 0$ as agent incurs disutility when deviating from the ideal

This utility function closely follows that introduced in Akerlof and Kranton (2005), with

[9] In a standard model with hidden action and risk-averse agents, principal faces the trade-off between insurance and incentive. Therefore investment in organizational culture has an additional benefit in a hidden action setting - principal could avoid facing the insurance/incentives trade-off by fostering an insider culture of high effort ideal.

adjustments made to incorporate a linear contract and allow for continuous effort[10]. The first three terms are standard in principal-agent models, describing utility gained from income and disutility from exerting effort; the last two are innovations of the identity-based framework. The intrinsic value of identity I_d is the utility agent gains for having the identity d. This value affects only agent's choice of identity and has no direct effect on effort choice; therefore we abstract from this term by assuming it is the same for both insiders and outsiders in subsequent analysis, and focus on the more interesting second identity term. The second term involves the square of the difference between effort ideal and actual effort choice, multiplied by the responsiveness coefficient t_d (and two for normalization). This means the agent experiences disutility when her effort choice deviates from the ideal of her identity. This effect is larger when an agent cares more about conforming to the ideal (i.e. larger t_d); as this parameter increases, agent will place heavier emphasis on conforming to the ideal over monetary and effort cost concerns.

Following the notation of Akerlof and Kranton (2005), the effort ideals for the insider and the outsider are $e^*(N)$ and $e^*(O)$ respectively. The term $e^*(O)$ could be interpreted as the company standard from previous work experience, the industry average effort, or the local norm. Therefore, in the case where an identity investment is made (3a), P introduces a particular company culture $e^*(N)$ different from $e^*(O)$ outside the firm. A chooses both identity (d) and effort level (e) to maximize her utility. Otherwise, A assumes outsider (O) identity and chooses only effort.

While income and identity utility are additively separable, this does not mean that this set-up does not allow for their interactions. In Section 4, we introduce pay-dependent ideals by allowing $e^*(d)$ to depend on incentive pay.

Agents are assumed to be risk-neutral in money. Under the current set-up with no hidden action, this assumption can be relaxed with subsequent results following easily. In a situation with hidden action and risk-averse agent, principal further benefits from investing in organizational culture as it poses no trade-off between insurance and incentive. However, this does not mean that monetary incentives will not be used. With positive pay-dependency of effort ideals, the principal may still combine the two management practices to ensure that the agent adopts a high effort ideal. As we will see in Section 4, the mechanisms to be

[10] Agent's utility function in Akerlof and Kranton (2005) is $U = \ln(y) - e + I_d - t_d|e^*(d) - e|$, where U is the worker's utility, y is her income, e is her actual effort, and d is her identity. Compare this with (3.1), the Akerlof and Kranton (2005) model assumes cost of effort C(e)=e, and a linear loss from deviation from effort ideal. The absolute value function presents problems with differentiability in the case of continuous effort, and therefore is replaced by the quadratic function.

discussed could lead to the complementarity of management practices regardless of agent's risk preferences.

Here effort e can be broadly interpreted, for example as hours worked, the number of overtime hours, number of tasks completed, or quality of work. In the context of the shoe factory in Ethiopia, expectations of working hours in China and Ethiopia differ as mentioned in Sanderson (2013). A natural interpretation for effort then relates to overtime hours worked, with different working hour ideals represented by different values for $e^*(N)$ and $e^*(O)$. In this context, e is constrained to real numbers in an interval, $e \in [0, h]$, where h is the maximum working hours possible.

3.3 Principal's Problem

The firm's profit π is:

$$\pi = R(e) - \alpha - \beta e - F * J_\epsilon \tag{3.2}$$

where

$R(e)$ = revenue: a weakly increasing, concave function of effort e (so $R'(e) \geq 0$ and $R''(e) \leq 0$)

α = fixed pay: wage/fixed salary

β = incentive pay: piece rate/bonus

J_ϵ = indicator function (J used to avoid confusion with intrinsic value of identity I_d)

$J\epsilon = 1$ if the firm makes the identity investment

$J\epsilon = 0$ if the firm makes no identity investment

F = cost of identity investment establishing organizational culture, $F > 0$

We consider only identity of the agent and assume the principal has no intrinsic preferences over identities. The profit function is standard with an additional cost term if P invests in organizational culture.

3.4 Solution

We will present two cases in this section, one without identity considerations and one with fully exogenous effort ideals. The first corresponds to the standard model without

identity, and the second to the baseline model in Akerlof and Kranton (2005) but with continuous effort.

3.4.1 No Identity Considerations

This section presents the result of standard models where utility function of agents is a special case of (3.1). Here the identity terms are irrelevant to the agent (t_d and I_d both zero), so her utility function can be characterized as:

$$U = \alpha + \beta e - C(e) \tag{3.3}$$

To find a relationship between optimal effort to induce and incentive pay, we solve for the first order condition (FOC) of (3.3) with respect to e and obtain:

$$\beta = C'(e) \tag{3.4}$$

Since cost of the identity investment F is non-zero, the firm trivially has no incentive to make an identity investment. Therefore P maximizes profit subject to incentive compatibility (IC) and individual rationality (IR) constraints for the agent. Fixed pay is set to satisfy IR, $\alpha = \bar{u} - \beta e + C(e)$, where $\bar{u}$ is the agent's reservation utility. Substituting this expression for fixed pay into (3.2), principal's profit function can be rewritten as $\pi = R(e) + \bar{u} - C(e)$. Dropping the constant, the principal maximizes the following with respect to e:

$$max\ R(e) - C(e) \tag{3.5}$$

The optimal effort e to induce can be found by solving the FOC of (3.5) with respect to e:

$$R'(e) = C'(e) \tag{3.6}$$

Combining (3.4) and (3.6), we can find the incentive pay set to induce the optimal effort:

$$\beta = R'(e) \tag{3.7}$$

Incentive pay is set to equal to the marginal revenue at the optimal effort. This aligns

the interests of the agent and the principal.

3.4.2 Solution with Fully Exogenous Effort Ideals

This section considers the role of identity and presents the result for the situation where effort ideals are exogenous. That is, insider and outsider face fixed effort ideals $e^*(N)$ and $e^*(O)$ respectively, and incentives have no psychological effect.

We first make the assumption that insiders face a higher effort ideal, $e^*(N) > e^*(O)$ and solve the agent's problem. Solving for the FOC of agent's utility function (3.1) with respect to effort e yields:

$$\beta - C'(e) + t_d(e^*(d) - e) = 0 \tag{3.8}$$

Since (3.1) is the sum of functions concave in e and therefore is itself concave, the second order condition (SOC) is satisfied and e that solves FOC maximizes utility.

Rearrange (3.8) to see the effect of incentive pay and identity on optimal effort:

$$\beta + t_d(e^*(d)) = t_d e + C'(e) \tag{3.9}$$

Note that the right-hand side (RHS) $te + C'(e)$ is increasing in e as t > 0 and C(e) is an increasing, convex function of e. Therefore, an increase in the left-hand side (LHS) will lead to an increase in optimal effort; that is, effort can be increased through higher incentive, higher ideal effort level, or higher responsiveness to ideal.

Now assume C(e) $= \frac{c}{2}e^2$, a known function with known parameter c. This specific increasing, convex function is a simplifying assumption that allows us to solve for close-form solutions, and is not crucial to findings of the model[11].

Substitute the expression for cost of effort into the first-order condition (3.8) and solve for the optimal effort to induce for each identity e_d, we obtain:

$$e_d = \frac{\beta + t_d(e^*(d))}{c + t_d} \tag{3.10}$$

For any given incentive, insiders would always exert higher effort because of their higher ideals. Therefore, the optimal effort to induce is higher for insiders than outsiders.

Note the marginal effect of incentive on effort:

[11] Commonly used in standard models, this quadratic effort cost function conveniently mirrors the quadratic disutility of deviation from ideals. The psychologic costs of exerting effort and deviating from ideals are assumed to be of the same order, different from that of material gain/loss.

$$\frac{\partial e_d}{\partial \beta} = \frac{1}{c + t_d} \tag{3.11}$$

Increases in incentive have a direct, positive effect on the agent's optimal effort. This effect is smaller when the cost of effort is high and/or the agent is more concerned with conforming to her identity ideal (and therefore is less responsive to monetary incentives which have no psychological effect here).

The difference in utility for an insider and an outsider is $\triangle U = U_N\text{-}U_O = \beta(e_N - e_O) - \frac{c}{2}(e_N^2 - e_O^2) + (I_N - I_O) - [\frac{t_N}{2}(e^*(N) - e_N)^2 - \frac{t_O}{2}(e^*(O) - e_O)^2]$. A worker will choose insider identity if $\triangle U > 0$. This depends on standard parameters such as incentive pay and cost of effort, as well as identity terms - the intrinsic value, ideal and responsiveness to ideal of both the insider and outsider identities.

We assume that the effort ideals have values such that if P invests in organizational culture, then A will adopt the insider identity. In other words, the insider ideal is not unreasonably high that it becomes unattainable and deters agents from becoming insiders. In Section 4 with pay-dependent ideals, we find conditions under which A adopts the insider identity, and show that it is actually the case that when P invests, A will always adopt the insider identity.

We now turn to the principal's problem. The individual rationality constraint is satisfied by fixed pay set to a level that meets the agent's reservation utility:

$$\alpha = \bar{u} - \beta e + C(e) - I_d + \frac{t_d}{2}[e^*(d) - e]^2 \tag{3.12}$$

Substitute (3.12) into principal's profit function (3.2) and we obtain the general expression for profit which the firm maximizes:

$$\pi = R(e) - C(e) + I_d - \frac{t_d}{2}[e^*(d) - e]^2 \tag{3.13}$$

First we solve the subgame where P invests in organizational culture and A adopts an insider identity. The FOC of (3.1) with respect to effort for an insider is (3.8) with N subscripts:

$$\beta_N - C'(e_N) + t_N(e^*(N) - e_N) = 0 \tag{3.14}$$

We find the optimal effort e_N to induce by solving the FOC of (3.13) with respect to effort:

$$R'(e_N) - C'(e_N) + t_N(e^*(N) - e_N) = 0 \tag{3.15}$$

Comparing (3.14) and (3.15), we obtain:

$$\beta_N = R'(e_N) \tag{3.16}$$

If P does not make the identity investment, A stays as an outsider. We can similarly solve for the level of incentives and the optimal effort to induce from (3.8) with O subscripts and (3.13), which give:

$$\beta_O = R'(e_O) \tag{3.17}$$

Therefore, the relationship between optimal effort and incentive pay (3.7) $\beta = R'(e)$ holds under identity considerations as well. Note that although the relationship is summarized by the same function, the incentive pay is not the same - the optimal effort induced diverges from that in the previous section, and differs between insiders and outsiders.

In the case where R(e) = γe, the optimal incentive is the same as in standard models $\beta = \gamma$, but the level of effort will vary according to the ideal level $e^*(d)$ and responsiveness t_d.

In more general functions of revenue, since R(e) is concave, higher e will lead to lower $R'(e)$. Therefore, the optimal incentive for insiders is lower-powered with smaller incentive pay. This corresponds to the results of Akerlof and Kranton (2005), as we maintained their assumption that ideal levels $e^*(d)$ are exogenous.

4 Pay-dependent Effort Ideals

Now we relax the second assumption in Akerlof and Kranton (2005) that ideals are exogenous and introduce pay-dependency - ideal effort levels depend positively on incentives (β) set, so $e^*(N)$ and $e^*(O)$ are both endogenous to P. Two plausible mechanisms, signalling and peer effect, could account for this positive pay-dependency.

4.1 Two Mechanisms for Positive Pay-dependency

In this section, we describe signalling and peer effect, and their implications in the identity-based framework. These mechanisms allow us to consider the role of identity in different dimensions - signalling depends only the interaction between agent and principal, while peer effect involves also the possible interaction among agents within the firm.

4.1.1 Signalling

Signalling is relevant when a worker has imperfect information about the ideal effort level that maximizes the firm's profit, or in other words, the norm of behaviour in the workplace. This information asymmetry might arise from uncertainties associated with other factors of production such as material costs, or with consumer demand. For example, in an interview at the shoe factory in Ethiopia, the plant manager remarked that overtime largely depends on demand as the volume of customer orders fluctuates. A firm may pay higher overtime rates when large orders are received. Higher monetary incentive could act a credible signal of a higher standard to workers when higher effort is needed as it conveys the marginal value of effort.

How this signal is perceived, however, depends on the identity of the worker. On the one hand, an insider, as someone who cares about company goals, better internalizes the standard; an outsider, on the other hand, may choose to ignore the signal or internalize it to a more limited extent. Therefore, the ideal effort internalized by an insider will be more responsive to the incentive signal than the ideal effort internalized by an outsider.

4.1.2 Peer effect

If an agent cares about the action of other employees, then peer effect is another mechanism through which incentives affect effort ideals. Concerned with keeping up with others when incentives are raised, the agent will adjust ideal effort upwards accordingly.

Identity could affect this dependency as insiders and outsiders face different degrees of peer effect. For example, an insider might be more involved on the job and care more about other employees in the firm; therefore, she might be more concerned with keeping a positive image and would not lag behind her peers. An outsider might be more aloof and stays content with exerting minimal effort even if her peers become more hardworking.

Investment in organizational culture allows firms to strengthen this peer effect. For exam-

ple, Christmas parties and company events allow employees to develop closer relationships with each other. Other activities, such as morning exercises, provide an avenue through which workers identity and accept others in the factory as relevant peers.

4.1.3 Partial Influence over Insider Effort Ideal

Both mechanisms discussed lead to positive dependency of ideals on incentives, and higher responsiveness to incentives of insider ideals than that of outsiders. They are not mutually exclusive and could be present at the same time and reinforce each other. Therefore, in Section 4.2 below we capture the positive pay-dependency of ideals in reduced form, where $e^*(d)$ is assumed to be a linear function of β with positive coefficients.

In the subsequent analysis, we assume that the firm does not have total influence over the ideal adopted by insiders - organizational culture creates the insider identity but by no means completely dictate the ideal insiders internalize. This naturally follows if the firm does not operate in isolation. Environmental factors that the principal cannot control may also play a role in affecting the effort ideals. In the context of a local subsidiary of a foreign multinational corporation (MNC), we can interpret the outsider identity as simply conforming to the local culture. Although the MNC could implement consistent corporate culture across all its subsidiaries, the local culture would still have an anchoring effect; the existence of such location-driven "ideal stickiness" means that corporate culture can only partially affect the effort ideals of insiders, $e^*(N)$. In summary, the ideal adopted is a function of the identity of the agent, dynamics within the firm and external factors such the local culture. With limited influence over $e^*(N)$ through corporate culture alone, the firm uses incentive pay to change effort ideal, through either signalling or peer effect as previously discussed. To model this in Section 4.3, we assume that the positive coefficients in the linear function for both $e^*(N)$ and $e^*(O)$ are fixed and exogenous, with a higher coefficient for insiders.

In Section 7.1, we solve the model allowing the effort ideal of insiders to be fully endogenous, where the firm freely sets the ideal adopted by insiders. The firm is shown to always ensure, through the use of organizational culture and low-powered incentives, that insiders adopt a high effort ideal. This scenario allows the firm to completely influence the ideal internalized by insiders. To avoid making this strong assumption, we proceed with the analysis assuming limited influence of the firm on insider ideals.

4.1.4 Alternative Mechanisms

Before solving the model, we consider other possible psychological mechanisms that could affect the effort ideal.

One possible consideration is the effect of fixed pay on effort ideals. However, this does not arise naturally under our current set-up. Under the signalling mechanism, incentive pay is an effective signal because it provides information on the marginal value of effort. As fixed pay does not provide this information, it is unlikely for the agent to deduce the preferences of the principal from the wage offered. When peer effect is relevant, higher incentive pay creates an upward pressure on effort ideals. Increased fixed pay provides no such financial incentive for greater effort; therefore the agent has no reason to expect peers pressure for higher effort.

Even though the two mechanisms discussed above do not lead to wage-dependent ideals, this does not exclude the possibility of other ways wage may affect the ideal level of effort. One popular theory is gift exchange. In Akerlof (1982), effort depends upon the workplace norm, which could be affected by wage, so firms consistently pay above market-clearing wage to induce higher norms. Empirical evidence of gift exchange is ambiguous, however. Although some papers show positive results for short-term interactions in the laboratory[12], Gneezy and List (2006) establish that there is no evidence for gift exchange after the initial few hours using field evidence from data entry for university library and door-to-door fundraising for research center. Similarly, in Davies and Fafchamps (2015), agents choose to exert low effort despite high wage offers in a relational contracting experiment in Ghana.

Under the signalling mechanism, incentive is used to signal the principal's preferred effort. The firm can also communicate its goals by setting a company standard and directly communicating with its workers. This could complement incentive pay, but alone may not be effective as there may be hidden costs of control as in Falk and Kosfeld (2006). A set standard may be seen as a restriction on the agent's effort choice and interpreted as distrust from the principal, and therefore leading to negative response from the agent. Incentives, on the other hand, do not pose a particular level of effort that the agent has to exert. The agent is awarded for her extra effort, and is under no pressure to choose any particular effort level.

[12]For example, Fehr et al. (1993), the seminal paper on gift-exchange game, reports positive reciprocity in a laboratory experiment. Fehr and Gachter (2000) provides a survey and discussion of positive and negative reciprocity.

The positive dependency assumption might not hold under information asymmetry other than those discussed above, however. For example, in Sliwka (2007), with three types of agents (selfish agents, fair agents and conformists) and uncertainty in the distribution of types, incentive pay signals P's belief on the distribution of types, and could negatively or positively affect the norm depending on prior beliefs. In Benabou and Tirole (2003), incentives could have a crowding out effect if they signal a tedious task and P has better information on A's cost of effort. Therefore, to test the robustness of our model, we discuss the possibility of negative pay-dependency and its implications in Section 7.2.

Under assumptions of known ability and types of agent, we proceed with the set-up under positive pay-dependency.

4.2 Set-up

Under the general set-up presented in Section 3.1, we assume $e^*(O) = M_O\dot{e}$ and $e^*(N) = M_N\dot{e}$, where $\dot{e}$ denote the optimal level of effort without identity considerations (as in Section 3.4.1), and M_d is the ideal coefficient for identity d. This reflects the ideal level of effort for identity d as a percentage of $\dot{e}$. In this section we assume the ideal coefficients for both insiders and outsiders are exogenous, and later explore endogenous ideal coefficient for insiders in Section 7.1. Note that $M_d < 1$ can be interpreted as a standard that promotes working below the optimal effort level, whereas $M_d > 1$ promotes ideal effort higher than the level without identity considerations.

In the case where A's ability (c) is known and effort cost is quadratic, we have $e^*(d) = M_d\frac{\beta}{c}$. The effort ideal depends linearly on the incentive pay. Note that the linearity assumption is made for its simplicity and could be relaxed as subsequent results follow from positive pay-dependency, not the specific functional form assumed.

4.3 Solution with Exogenous Ideal Coefficient

Here we assume that the principal can influence the effort ideal through the level of incentives, but does not have complete freedom to set the ideal. As discussed above, this could reflect "ideal stickiness" where other environmental factors affect the ideal, leading to the principal's partial influence over $e^*(N)$. Specifically, we assume that the ideal is a linear function of incentive pay, $e^*(O) = M_O\frac{\beta}{c}$ and $e^*(N) = M_N\frac{\beta}{c}$, with both ideal coefficients M_N and M_O exogenous.

We assume $M_O < M_N$ as the firm tries to induce an effort standard higher than the level existing outside the firm and consider the case where the outsider identity is to underperform, $M_O < 1$. This allows us to examine how monetary incentives and identity investments interact to mitigate this problem of underperformance.

Note that $e^*(d)$ is variable and depends on β set by the firm, where higher β leads to higher effort ideals for both identities. However, because of differences in M_d, the ideal effort for an outsider is persistently lower than the ideal effort for an insider.

4.3.1 Solution to Agent's Problem

The method of solving the agent's problem is the same as that presented in Section 3.4.2. Here we note that the exogenous ideals are replaced with pay-dependent ideals. Therefore, substituting $e^*(d) = M_d\frac{\beta}{c}$ into the agent's utility function (3.1), the agent maximizes the following with respect to effort:

$$U = \alpha + \beta e - \frac{c}{2}e^2 + I_d - \frac{t_d}{2}[\frac{M_d\beta}{c} - e]^2 \tag{4.1}$$

We can solve for the optimal effort from the FOC of (4.1), or directly substitute $e^*(d) = M_d\frac{\beta}{c}$ into the expression for optimal effort (3.10):

$$e = \frac{\beta + t_d\frac{\beta}{c}M_d}{c + t_d}$$

$$e = \frac{\beta}{c}(\frac{c + t_dM_d}{c + t_d}) \tag{4.2}$$

As in Section 3.4.2, we find the effect of the incentive pay β on A's optimal effort by differentiating (4.2) with respect to β:

$$\frac{\partial e}{\partial \beta} = \frac{1}{c}(\frac{c + t_dM_d}{c + t_d}) \tag{4.3}$$

$$\frac{\partial e}{\partial \beta} = \underbrace{\frac{1}{c + t_d}}_{\text{direct effect}} + \underbrace{\frac{t_dM_d}{c(c + t_d)}}_{\text{reinforcement effect}}$$

The effect of β on optimal effort now has two components. The first component is the direct effect, which mirrors the right-hand side of (3.11) as discussed in the case of exogenous

ideal level in Section 3.4.2. The second component arises from the increased effort ideal, which further increases optimal effort. This **reinforcement effect** holds for any identity type d - higher β leads to higher ideal level, which further increases effort in addition to the direct effect. This is a direct consequence of pay-dependency discussed in Section 4.1.

Turning to the worker's choice of identity given monetary incentives and ideals, worker chooses N if:

$$\alpha+\beta e_N-C(e_N)+I_N-\frac{t_N}{2}[e^*(N)-e_N]^2 \geq \alpha+\beta e_O-C(e_O)+I_O-\frac{t_O}{2}[e^*(O)-e_O]^2 \quad (4.4)$$

In subsequent analysis, we assume $t_N = t_O = t$ and $I_N = I_O = 0$ to isolate the effect of ideals. Note that identity and ideals become synonymous - an agent's identity can be characterized by the ideal she internalizes.

Assuming a quadratic cost function to find close-form solutions, we can rewrite inequality (4.4). Substitute C(e) = $\frac{c}{2}e^2$ and simplify, the worker chooses the insider identity N if:

$$\beta(e_N-e_O)-\frac{c}{2}(e_N^2-e_O^2)-\frac{t}{2}[(\frac{\beta}{c}M_N-e_N)^2-(\frac{\beta}{c}M_O-e_O)^2] \geq 0 \quad (4.5)$$

Further simplifying this inequality we get:

$$2t(M_N-M_O)-(M_N+M_O)t(M_N-M_O)-c[(M_N-1)^2-(M_O-1)^2] \geq 0 \quad (4.6)$$

This is the **Identity Selection (IS)** constraint for worker to adopt the insider identity. Note that monetary incentive is irrelevant to the worker in their choice of identity to adopt. The next lemma presents conditions equivalent to (4.6) to facilitate interpretation of this constraint.

Lemma. *For $M_O < M_N$, IS is satisfied if and only if either of the below inequalities hold:*

$$M_N + M_O \leq 2 \quad (4.7)$$

$$(M_N-1)^2 \leq (M_O-1)^2 \quad (4.8)$$

Proof. Suppose the IS constraint holds (so worker decides to adopt N), then clearly either $M_N + M_O \leq 2$ or $(M_N-1)^2 \leq (M_O-1)^2$ holds.

Now suppose either $M_N + M_O \leq 2$ or $(M_N-1)^2 \leq (M_O-1)^2$. Note that these two

are equivalent under the assumption $M_O < M_N$, so both inequalities hold and thus IS is satisfied. Therefore, $M_N + M_O \leq 2$ and $(M_N - 1)^2 \leq (M_O - 1)^2$ are both necessary and sufficient conditions for IS to hold. □

The implication of the IS constraint is best understood by examining inequality (4.8). It says that the worker will adopt an insider identity if the insider ideal is closer than the outsider ideal to $\dot{e}$ (optimal effort without identity considerations). Therefore, the IS can be interpreted as a requirement for the ideal chosen to be close to the efficient effort.

4.3.2 Solution to Principal's Problem

We now turn to the principal's problem. Using results from the previous section, we can solve for the optimal effort and combination of management practices to use.

Suppose the cost of identity investment is lower than its benefit so the firm establishes organizational culture. This presents the agent the option of choosing the insider identity. If $M_O < M_N < 1$, then by lemma in Section 4.3.1, the IS condition is satisfied and the agent will choose to adopt an insider identity. Her optimal effort can be found from the FOC of the utility function (4.1) for an insider with respect to effort:

$$\beta - C'(e) + t_N(e^*(N) - e) = 0 \tag{4.9}$$

The principal again maximizes profit (3.13). The key difference here is that now as we are solving for the FOC of (3.13) with respect to effort, $e^*(N)$ is no longer exogenous:

$$R'(e.) - C'(e) - t_N(e^*(N) - e)(\frac{\partial e^*}{\partial \beta}\frac{\partial \beta}{\partial e} - 1) = 0 \tag{4.10}$$

With quadratic cost C(e) = $\frac{c}{2}e^2$, we can solve for β from (4.9) and substitute it into (4.10). This gives us an expression for the optimal incentive:

$$\beta_N = R'(e_N)\frac{c + t_N M_N}{c + t_N M_N^2} \tag{4.11}$$

Substituting this expression into (4.2) $e = \frac{\beta}{c}(\frac{c+t_d M_d}{c+t_d})$ to solve for optimal effort:

$$e_N = \frac{R'(e_N)}{c}\frac{(c + t_N M_N)^2}{(c + t_N M_N^2)(c + t_N)} \tag{4.12}$$

Similarly we can solve for the optimal effort and incentives for an outsider:

$$\beta_O = R'(e_O)\frac{c + t_O M_O}{c + t_O M_O^2} \tag{4.13}$$

$$e_O = R'(e_O)\frac{(c + t_O M_O)^2}{c(c + t_O)(c + t_O M_O^2)} \tag{4.14}$$

The relationship between incentive pay and optimal effort is no longer described by (3.7) $\beta = R'(e)$. The identity parameters (t and M) are also relevant.

To make the decision whether to invest, the firm compares the profit under the costly identity investment that fosters insider culture, with that where workers stay as outsiders but the firm saves on the investment cost. Therefore, P chooses to invest in organizational culture if $[R(e_N) - R(e_O)] - \frac{c}{2}(e_N^2 - e_O^2) - \frac{t}{2}[e^*(N) - e_N]^2 + \frac{t}{2}[e^*(O) - e_o]^2 \geq F$.

Now we are in a position to ask how optimal incentives relate to identity and cost parameters. In the case of linear revenue R(e) = γe, we have explicit expressions for effort and piece rate:

$$\beta_N = \gamma\frac{c + t_N M_N}{c + t_N M_N^2} \tag{4.15}$$

$$e_N = \frac{\gamma}{c}\frac{(c + t_N M_N)^2}{(c + t_N M_N^2)(c + t_N)} \tag{4.16}$$

Similar results hold for outsiders with O subscripts.

The level of the ideal coefficient M has implications for the optimal incentive. To see the effect of higher M, we can drop the identity subscripts as the expression is the same for insiders and outsiders and differentiate (4.15) with respect to M:

$$\frac{\partial\beta}{\partial M} = \frac{\gamma t(c + tM^2) - \gamma(c + tM)(2tM)}{(c + tM^2)^2}$$

$$= k[c(1 - 2M) - M^2 t] \tag{4.17}$$

where k is a positive number.

Observe that the part in square brackets $[c(1 - 2M) - M^2 t]$ is a downward parabola with one positive ($\frac{-c+\sqrt{c^2+ct}}{t}$) and one negative root ($\frac{-c-\sqrt{c^2+ct}}{t}$) as shown in Figure 4.1. Therefore, the derivative is positive for all values of M between 0 and the positive root, and

negative for all values larger than the positive root:

$\frac{\partial \beta}{\partial M} > 0$ for $0 <$ M $< \frac{-c+\sqrt{c^2+ct}}{t}$

$\frac{\partial \beta}{\partial M} < 0$ for M $> \frac{-c+\sqrt{c^2+ct}}{t}$

This result says that if the ideal coefficient is very low, then an (exogenous) increase in the ideal could be accompanied by higher optimal monetary incentive.

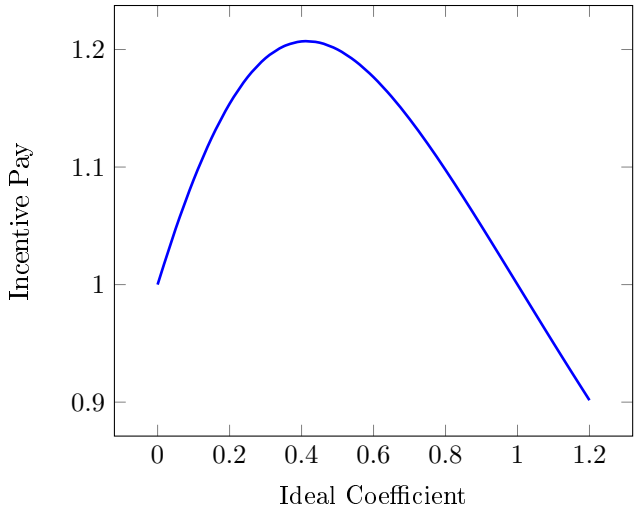

Figure 4.1: Incentive Pay and Ideal Coefficient

Figure 4.1 shows β as a function of M for $\gamma = t = c = 1$ in the relevant positive range of M. The non-monotonic relationship holds for general R(e) concave, with different threshold values (e.g. for R(e) $= \sqrt{e}$, the threshold shifts to the left). An interpretation is that for low values of M, effort is low and the revenue function could be approximated by a linear function. Therefore, the positive relationship between β and M still holds for low values of M.

Note that the threshold at which $\frac{\partial \beta}{\partial M}$ changes sign is always smaller than 0.5 for positive c and t:

$$\frac{-c+\sqrt{c^2+ct}}{t} \leq \frac{-c+\sqrt{c^2+ct+1/4t}}{t} = \frac{1}{2} \tag{4.18}$$

For a small range of values of M in the interval $[0, 1]$, β actually increases with the ideal coefficient. This shows that although monetary incentives and identity investments are substitutes as in Akerlof and Kranton (2005) for a larger range of values in the interval $[0, 1]$ of the ideal coefficient, these management practices could also be complements.

4.4 Discussion of Results

This model could fit evidence that firms spend resources on developing and maintaining organizational culture, in some cases with high and other cases with low-powered incentives. Assuming the outsider identity involves underperformance, P makes costly identity investment to increase effort to a level in line with results from standard models.

In the case where firm faces pay-dependency but the insider coefficient (M_N) is exogenous, the relationship between M and monetary incentive is non-monotonic because of two conflicting effects:

- The **reinforcement effect** arises from the positive pay-dependency of ideals, where the agent adjusts her effort ideal upwards with higher β, and the higher ideal in turn encourages higher effort. At M = 0, optimal β is low because this secondary effect does not exist. As M increases, the reinforcement effect becomes relevant and a higher β becomes optimal.

- The **attainability effect** arises because there is a particular optimal level of effort to induce as determined by the revenue functions R(e) and effort cost function C(e). In the case where R(e) is linear, the optimal effort to induce is $\frac{\gamma}{c}$. As M increases, it is not optimal to use high power incentives as they will lead to a high ideal effort that is hard to attain, resulting in high disutility for the agent from not achieving the ideal. The principal then internalizes this effect as a higher fixed pay would be needed to satisfy the individual rationality (IR) constraint. Therefore, lower β becomes optimal.

The reinforcement effect is stronger for smaller values of M and is eventually overpowered by the attainability effect. As shown in Section 4.3, we observe the maximum for β at $\bar{M} = \frac{-c+\sqrt{c^2+ct}}{t}$ in the case of linear revenue.

Unlike in Akerlof and Kranton (2005), monetary incentives and identity investments are not necessarily substitutes. In the range $M_N \leq \bar{M}$, identity investment and monetary incentives are complements. This could explain the contrast between management practices at Huajian and practices at locally owned and operated Ethiopian companies. The foreign factory combines a high-powered incentive structure and strong corporate culture, while local firms use low financial incentive without investing in corporate culture.

For $M_N \geq \bar{M}$, monetary incentives and identity investments are substitutes. Compare a management consulting firm (or academia) and a 9 to 5 office work, the former is often said

to have strong organizational culture and involves long hours of unpaid overtime. Overtime in the latter, however, is significantly compensated (e.g. 1.5 times the regular pay). These could be represented in Figure 4.1, where both organizations are to the right of $\bar{M}$, but the former that involves low incentive and strong culture is further to the right than the latter that uses stronger incentive and lower investments in corporate culture.

Note that $\frac{d\beta}{dt} = M(c + tM^2) - M^2(c + tM) = cM(1 - M)$, so we have

$\frac{d\beta}{dt} > 0$ for M<1

$\frac{d\beta}{dt} < 0$ for M>1

$\frac{d\beta}{dt} = 0$ for M=1

Furthermore, as a consequence of the non-monotonic relationship between β and M, there is a non-monotonic relationship between incentive and effort (where each point correspond to a particular value of M):

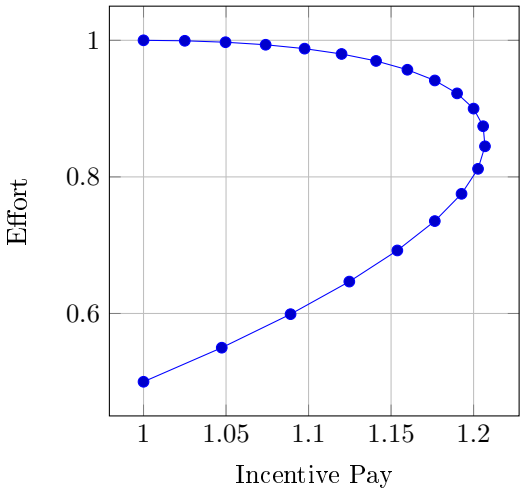

Figure 4.2: Effort and Incentive Pay

It is therefore possible to observe significantly different effort levels of homogenous agents in two organizations even though they are providing the same monetary incentive. This could be explained by different insider ideals (characterized byM_N) and could fit the observation in Bartel et al. (2004) of a U.S. bank, where cross-branch differences in attitudes are highly correlated with sales performance of the branches. Each branch adopts the same formal practices including the compensation scheme, but does not make the same investment to foster organizational culture. This result would be puzzling without identity considerations in standard models, but is readily explained by different ideal effort levels across different branches of the bank.

To explore the effect of ideal coefficient on a number of other endogenous variables, we discuss the comparative statics in the next section.

5 Comparative Statics

A few comparative stats are relevant in understanding the implications of the model. We explore how the ideal coefficient M affects endogenous variables including effort, ideal effort, revenue and profit. From the lemma and the proposition that follows, we find that profit is increasing in M for $M \leq 1$ and concave for $\bar{M} \leq M \leq 1$. This result implies conditions under which the firm is more likely to invest in organizational culture.

Lemma. *The following results hold for $M \leq 1$:*

a) Effort is increasing for general R(e).

b) Effort is concave in M for $\bar{N} \leq M \leq 1$, where $\bar{N} \leq 0.5$.

c) Effort ideal is increasing in M and always smaller than actual effort.

e) Revenue R(e) is increasing in M.

f) R(e) is concave in M for $\bar{N} \leq M \leq 1$.

Proof. a) Effort is increasing for general R(e).

We found the expressions for optimal effort (4.12) and (4.14) in Section 4.3. Dropping identity subscripts, we have: this

$$e = R'(e)\frac{(c+tM)^2}{c(c+t)(c+tM^2)} \tag{5.1}$$

Rearrange (5.1) and differentiate $e/R'(e)$ with respect to M:

$$\frac{\partial[e/R'(e)]}{\partial M} = \frac{2tc(c+tM)(1-M)}{(c+tM^2)^2} \tag{5.2}$$

Since $e/R'(e)$ is an increasing function of e, effort is increasing if the RHS is non-negative. This is true for all values of $M \leq 1$.

b) Effort is concave in M for $\bar{N} \leq M \leq 1$, where $\bar{N} \leq 0.5$.

Here we prove the result for linear revenue, with subscripts omitted for simplicity. Taking expression (5.1) with linear revenue, we have:

$$e = \frac{\gamma(c+tM)^2}{c(c+t)(c+tM^2)} \tag{5.3}$$

As in part a), differentiate with respect to M:

$$\frac{\partial e}{\partial M} = k_1 \frac{2(c+tM)t(c+tM^2) - (c+tM^2)(2tM)}{(c+tM^2)^2}$$

$$= k_1 \frac{2tc(c+tM)(1-M)}{(c+tM^2)^2}$$

$$= k_2 \frac{(c+tM)(1-M)}{(c+tM^2)^2}$$

Here k_1 and k_2 are both constants independent of M. Differentiate again:

$$\frac{\partial^2 e}{\partial M^2} = \frac{k_2}{(c+tM^2)^4}\{\frac{\partial (c+tM)(1-M)}{\partial M}(c+tM^2)^2 - (c+tM)(1-M)2(c+tM^2)(2tM)\}$$

$$= \frac{k_2}{(c+tM^2)^3}[(t-c-2tM)(c+tM^2) - 4tM(c+tM)(1-M)] \tag{5.4}$$

Examine the part in square brackets $[(t-c-2tM)(c+tM^2) - 4tM(c+tM)(1-M)]$ in (5.4): for $M \leq 1$, $\frac{\partial^2 e}{\partial M^2} \leq 0$ if $(t-c-2tM) \leq 0$. So in the range of M such that $M \geq \frac{t-c}{2t} = \frac{1}{2} - \frac{c}{2t} = \bar{N}$, e is concave in M. Note that if $t \leq c$, then e is concave in M for the entire range $M \leq 1$. This can be interpreted as the situation where the psychological cost of deviation from ideal is smaller than the cost of exerting effort.

Figure 5.1 shows effort as a function of M for $\gamma = t = c = 1$ for linear revenue function:

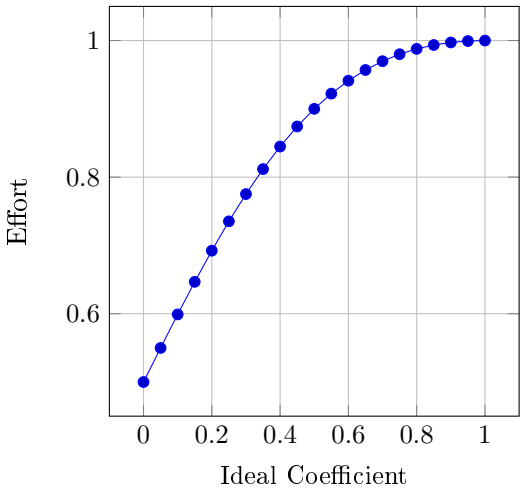

Figure 5.1: Effort and Ideal Coefficient for Linear Revenue

Figure 5.2 shows effort as a function of M for the square root revenue function R(e) =

$\sqrt{e}$, with $t = c = 1$. Note that effort is concave for the entire range $M \leq 1$ as in the case of linear revenue function.

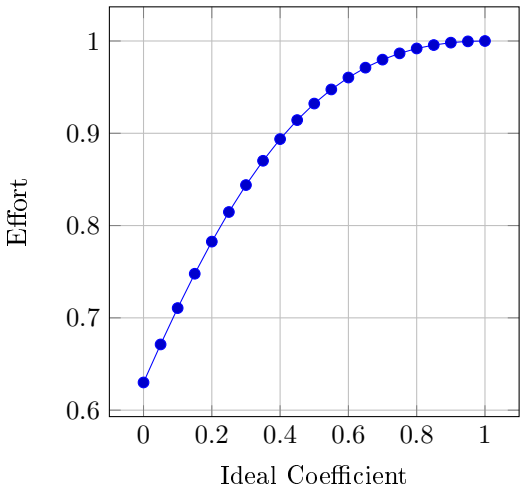

Figure 5.2: Effort and Ideal Coefficient for Non-linear Revenue

c) Effort ideal is increasing in M and always smaller than actual effort.

Substitute the expression for optimal incentive into the effort ideal $e^*(d)$, we have:

$$e^*(d) = \frac{M_d \beta}{c} = M_d \frac{R'(e_d)}{c} \frac{c + t_d M_d}{c + t_d M_d^2} = e_d \frac{M_d(c + t_d)}{c + t_d M_d} \tag{5.5}$$

For $M_d \leq 1$, $\frac{M_d(c+t_d)}{c+t_d M_d} \leq 1$, so $e^*(d) \leq e_d$. Equality holds at M=1.

To show that the effort ideal is increasing, we find the first derivative from (5.5):

$$\frac{\partial e^*}{\partial M} = \frac{\partial e}{\partial M}\left(\frac{M(c+t)}{c+tM}\right) + e\frac{\partial\left(\frac{M(c+t)}{c+tM}\right)}{\partial M} \tag{5.6}$$

We have proven in part a) that $\frac{\partial e}{\partial M} \geq 0$ and note that $\frac{\partial\left(\frac{M(c+t)}{c+tM}\right)}{\partial M} = \frac{c(c+t)}{c+tM} \geq 0$. Therefore, $\frac{\partial e^*}{\partial M} \geq 0$ so effort ideal is increasing in M.

d) Revenue R(e) is increasing in M for $M \leq 1$.

This holds since R(e) is an increasing function of e by assumption and e is increasing in M for $M \leq 1$ from part a).

e) R(e) is concave in M for $\bar{N} \leq M \leq 1$.

This holds because R(e) is non-decreasing and concave in e, and e is non-decreasing and concave in M. Therefore their composition is concave. □

With results of the lemma, we now prove a proposition that allows us to derive conditions under which the firm is more likely to invest in organizational culture.

Proposition. *Profit is increasing in M for $M \leq 1$ and concave for $\bar{M} \leq M \leq 1$ for any values of t and c and concave function $R(e)$, where $\bar{M} \leq 0.5$ is the threshold. For $R(e)$ linear, $\bar{M} = \frac{-c+\sqrt{c^2+ct}}{t}$.*

Figure 5.3 shows the profit function for $\gamma = t = c = 1$:

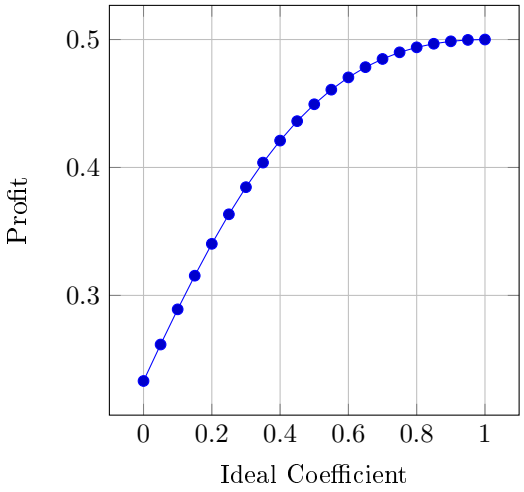

Figure 5.3: Profit and Ideal Coefficient

Proof. First, note that profit is increasing in effort for $M \leq 1$. From the lemma, we know that the optimal effort is increasing in M; therefore, profit is increasing in M.

Now to prove concavity in the range $\bar{M} \leq M \leq 1$, we write the expression for profit (3.13) without its identity subscripts d for simplicity:

$$\pi = R(e) - C(e) + I - \frac{t}{2}[e^* - e]^2 \tag{5.7}$$

By the Envelope Theorem:

$$\frac{d\pi}{dM} = \frac{\partial \pi}{\partial M} = R'(e)\frac{\partial e}{\partial M} - C'(e)\frac{\partial e}{\partial M} - t(e^* - e)(\frac{\partial e^*}{\partial M} - \frac{\partial e}{\partial M})$$

To check concavity, differentiate again:

$$\frac{d^2\pi}{dM^2} = R''(e)(\frac{\partial e}{\partial M})^2 + R'(e)\frac{\partial^2 e}{\partial M^2} - C''(e)(\frac{\partial e}{\partial M})^2 - C'(e)\frac{\partial^2 e}{\partial M^2} - t(\frac{\partial e^*}{\partial M} - \frac{\partial e}{\partial M})^2 - t(e^* - e)(\frac{\partial^2 e^*}{\partial M^2} - \frac{\partial^2 e}{\partial M^2})$$

Rearrange:

$$\frac{\partial^2\pi}{\partial M^2} = \underbrace{[R''(e)(\frac{\partial e}{\partial M})^2 - C''(e)(\frac{\partial e}{\partial M})^2 - t(\frac{\partial e^*}{\partial M} - \frac{\partial e}{\partial M})^2]}_{\text{(A)}} + \underbrace{R'(e)\frac{\partial^2 e}{\partial M^2} - C'(e)\frac{\partial^2 e}{\partial M^2} - t(e^* - e)(\frac{\partial^2 e^*}{\partial M^2} - \frac{\partial^2 e}{\partial M^2})}_{\text{(B)}}$$

Note that the first part in the square brackets (A) $[R''(e)(\frac{\partial e}{\partial M})^2 - C''(e)(\frac{\partial e}{\partial M})^2 - t(\frac{\partial e^*}{\partial M} - \frac{\partial e}{\partial M})^2]$ is always negative by concavity of R(e)and convexity of C(e).

Now let L = $\frac{M(c+t)}{c+tM}$, then $e^* = eL$. Differentiate twice:

$$\frac{\partial e^*}{\partial M} = L\frac{\partial e}{\partial M} + e\frac{\partial L}{\partial M}$$

$$\frac{\partial^2 e^*}{\partial M^2} = L\frac{\partial^2 e}{\partial M^2} + 2\frac{\partial L}{\partial M}\frac{\partial e}{\partial M} + e\frac{\partial^2 L}{\partial M^2}$$

So the second part (B) of $\frac{\partial^2\pi}{\partial M^2}$ is:

$$R'(e)\frac{\partial^2 e}{\partial M^2} - C'(e)\frac{\partial^2 e}{\partial M^2} - t(e^* - e)(\frac{\partial^2 e^*}{\partial M^2} - \frac{\partial^2 e}{\partial M^2})$$

$$= R'(e)\frac{\partial^2 e}{\partial M^2} - C'(e)\frac{\partial^2 e}{\partial M^2} - t(e^* - e)(L\frac{\partial^2 e}{\partial M^2} + 2\frac{\partial L}{\partial M}\frac{\partial e}{\partial M} + e\frac{\partial^2 L}{\partial M^2} - \frac{\partial^2 e}{\partial M^2})$$

Rearrange:

$$\underbrace{[R'(e) - C'(e) - t(e^* - e)(L-1)]}_{=0}\frac{\partial^2 e}{\partial M^2} - t(e^* - e)[2\frac{\partial L}{\partial M}\frac{\partial e}{\partial M} + e\frac{\partial^2 L}{\partial M^2}] = -t(e^* - e)[2\frac{\partial L}{\partial M}\frac{\partial e}{\partial M} + e\frac{\partial^2 L}{\partial M^2}]$$

Equality follows because the first part in bracket equals to 0 from the FOC of (3.5) with respect to effort, $R'(e) - C'(e) - t(e^* - e)(\frac{\partial e^*}{\partial e} - 1) = R'(e) - C'(e) - t(e^* - e)(L-1) = 0$.

Now the expression is negative if and only if $[2\frac{\partial L}{\partial M}\frac{\partial e}{\partial M} + e\frac{\partial^2 L}{\partial M^2}] \leq 0$ since $e^*(d) \leq e_d$. Calculate $\frac{\partial L}{\partial M}$ and $\frac{\partial^2 L}{\partial M^2}$ and substitute, we have:

$$2\frac{\partial L}{\partial M}\frac{\partial e}{\partial M} + e\frac{\partial^2 L}{\partial M^2} = \frac{2c(c+t)}{(c+Mt)^2}[\frac{\partial e}{\partial M} - \frac{et}{c+Mt}]$$

For R(e) linear, we can substitute in actual expressions for $\frac{\partial e}{\partial M}$ and $\frac{et}{c+Mt}$. After simplification, $[2\frac{\partial L}{\partial M}\frac{\partial e}{\partial M} + e\frac{\partial^2 L}{\partial M^2}] \leq 0$ if and only if $c(1-2M) - M^2 t \leq 0$. The equality is a quadratic equation with one negative root and one positive root, and we have inequality

hold for M $> \frac{-c+\sqrt{c^2+ct}}{t}$. So the $\frac{\partial^2 \pi}{\partial M^2} \leq 0$ for $1 >$ M $> \frac{-c+\sqrt{c^2+ct}}{t}$. □

Note that this threshold M is also where $\frac{\partial \beta}{\partial M}$ changes signs. M higher than the threshold is a sufficient condition for concavity of profit. It is possible for profit to be concave even if M is smaller than the threshold value since first part of the second derivative is always negative by concavity of R(e) and convexity of C(e).

These results allow us to derive conditions under which the firm is more likely to invest in organizational culture. Since profit is increasing in M and identity investment incurs a fixed cost, firms are more likely to implement an organizational culture if the difference between insider and outsider identities is large. Therefore, when the outsider culture is to significantly underperform and the firm could ensure a hardworking insider culture, the firm invest in organizational culture.

In the range of M where profit is concave, P is more likely to implement organizational culture if M_O is relatively small. When M_O is large (and close to 1), the gain from implementation is small as the outsider culture is already near the optimal. It could explain why not all firms implement a strong company culture - the benefit is not significant enough to cover the cost of implementation.

Another factor to consider is that not all firms face the same cost F of implementing organizational culture. Multi-national corporations (MNCs), for example, may be more experienced in identity investment, and therefore face a lower F in its foreign subsidiary than a small local firm. The MNC may have written materials, videos, and personnel readily available to establish a distinct organizational culture in a new branch. In this case, even if both firms can introduce the same M_N, only the MNC actually introduces corporate culture in its workplace. With data on management practices across the world over 10 years, the World Management Survey shows that workers behave similarly in multinational corporations (MNC) across cultures in different countries, as summarized in Bloom and Van Reenen (2010). These MNCs implement similar corporate culture across countries, and the corporate culture dominates local work attitude.

We derived three conditions in the current set-up for the principal to make the identity investment: when the outsider culture is to significantly underperform, when cost of establishing organizational culture is low, and/or when the firm can foster a hardworking insider culture. Next, using the result of the proposition, we consider an extension of the model.

This allows us to state the fourth condition under which the firm is more likely to invest in organizational culture.

6 Extension with Heterogeneous Outsider Identity

Suppose there are two agents with different outsider identities, where their effort ideals can be characterized by coefficients M_{O1} and M_{O2}. By concavity of the profit function for M not too small, the average profit from not implementing the organizational culture (i.e. agents keeping outsider identity) is smaller than the profit from homogenous agents with outsider identity $(M_{O1} + M_{O2})/2$. The gain from implementing M_N is higher; therefore, the firm is more likely to implement under heterogeneity of outsider identity.

This result similarly holds for a continuum of agents with different values of M_{Oi}. All other things equal, the distribution with larger variance will lead to greater benefit of implementing organizational culture.

The prediction that the firm experiences a greater profit increase from uniform insider culture with heterogeneous agents follows from the proposition without any additional assumptions on the interaction among agents[13]. This could fit evidence from Bloom and Van Reenen (2010) that multinational corporations often transport their management practices abroad – not only they might have a lower cost of implementing organizational culture, they also reap greater benefit from implementation as they are more likely to have hired people from a range of professional and cultural backgrounds.

7 Robustness

To test robustness to alternative assumptions, we explore two extensions in which effort ideal is fully endogenous, and discuss the implications of negative pay-dependency of ideals. The first extension allows us to examine the implications of principal's full influence over insiders' effort ideal. We show that this scenario could be easily incorporated as a special case of the framework with partial influence, and it implies that identity investments and monetary incentives are always substitutes. We then set up and solve for a model in which the effort ideal is endogenously determined through peer effect. Finally, we turn to consider

[13]The benefits of insider culture may be even greater if we model possible conflicts among agents with heterogeneous outsider identities.

the reverse of our crucial positive pay-dependency assumption and explain why similar results would still hold.

7.1 Full Influence over Insider Effort Ideal

In Section 4.1.3, we discussed the principal's partial influence over insiders' effort ideal. Now we assume that the firm have complete influence over the ideal insiders internalize. As the effort ideal is fully endogenous, the firm maximizes its profit subject to three constraints:

Incentive compatibility constraint (IC): Agent chooses effort and identity to maximize (3.1), that is e, d = arg $max\ \alpha + \beta e - C(e) + I_d - \frac{t_d}{2}[e^*(d) - e]^2$.

Individual rationality (IR): $\alpha + \beta e - C(e) + I_d - \frac{t_d}{2}[e^*(d) - e]^2 \geqslant \bar{u}$, where $\bar{u}$ is reservation utility. Choose fixed pay α so IR binds.

Identity selection (IS): $2t(M_N - M_O) - (M_N + M_O)t(M_N - M_O) - c[(M_N - 1)^2 - (M_O - 1)^2] \geq 0$. That is, inequality (4.6) or its equivalent conditions (4.7) and (4.8) should hold in the case where P decides to invest in organizational culture.

To make the decision of whether to invest, P compares profit under two schemes: only providing monetary incentives and A always follows the outsider ideal, or establishing organizational culture and giving worker the option of choosing an insider identity.

First, we solve the case where P does not establish organizational culture. As in the exogenous ideal coefficient analysis, the binding IR is substituted into the firm's profit function (3.2) to obtain (3.13). The firm takes M_O as given, and maximizes profit with respect to β and α:

$$max\ \pi = R(e) - C(e) + I_O - \frac{t_O}{2}[e^*(O) - e]^2 \tag{7.1}$$

We now solve the FOC of (7.1) with respect to β (dropping the O subscripts for simplicity):

$$0 = R'(e)\frac{\partial e}{\partial \beta} - ce\frac{\partial e}{\partial \beta} - t(\frac{M\beta}{c} - e)(\frac{M}{c} - \frac{\partial e}{\partial \beta})$$

Substituting (4.3) $\frac{\partial e}{\partial \beta} = \frac{1}{c}(\frac{c+tM}{c+t})$ to simplify and solve for β, we obtain:

$$\beta_O = R'(e)\frac{c + t_O M_O}{c + t_O M_O^2} \tag{7.2}$$

This is the same expression as (4.13), which we found before by solving FOC with respect to effort. The results are the same regardless of the method used because here we have a

one-to-one mapping between the optimal effort and incentive pay.

Now we turn to the more interesting case where P tries to establish a company culture. Substitute the binding IR into (3.2), the firm maximizes profit with respect to M_N, β and α:

$$max\ \pi = R(e) - C(e) + I_N - \frac{t_N}{2}[e^*(N) - e]^2 - FJ_\epsilon \tag{7.3}$$

The FOC[14] with respect to β is the same calculation as the no company culture case, and gives:

$$\beta_N = R'(e)\frac{c + t_N M_N}{c + t_N M_N^2} \tag{7.4}$$

The FOC of profit with respect to M_N (dropping the N subscripts) is:

$$0 = R'(e)\frac{\partial e}{\partial M} - ce\frac{\partial e}{\partial M} - t(\frac{M\beta}{c} - e)(\frac{\beta}{c} - \frac{\partial e}{\partial M}) \tag{7.5}$$

Substituting $\frac{\partial e}{\partial M} = \frac{1}{c}(\frac{\beta t}{c+t})$ into (7.5) and simplify, we get:

$$M_N = \frac{R'(e_N)}{\beta} \tag{7.6}$$

Substituting (7.4) into (7.6) and solve for M_N and β:

$$M_N = 1 \tag{7.7}$$

$$\beta = R'(e_N) \tag{7.8}$$

Note that for $M_N = 1$, $M_O \leq M_N$, $M_N + M_O \leq 2$ and $(M_N - 1)^2 = 0 \leq (M_O - 1)^2$. This satisfies the Identity Selection constraint; therefore if the firm decides to establish organizational culture, the worker will always adopt the insider identity.

Results (7.7) and (7.8) imply that the firm implements β to align the worker's interest with her own, and sets the insider ideal to minimize the worker's disutility from not attaining the ideal level. She has no incentive to set ideals any higher than $\dot{e}$ without identity considerations.

The firm chooses to invest in organizational culture if the additional profit from imple-

[14]Since revenue is concave in effort and effort is linear in β and M, the second-order conditions (SOCs) are satisfied and FOCs will give optimal values.

mentation is higher than the cost:

$$[R(e_N) - R(e_O)] - [C(e_N) - C(e_O)] - 0 + \frac{t}{2}[e^*(O) - e_o]^2 \geq F \tag{7.9}$$

There is no loss from not being able to attain identity ideal for the insider since M_N is set such that $\frac{t_N}{2}[e^*(N) - e]^2 = 0$.

Substituting expressions of β for outsiders (7.2) and insiders (7.4) into (4.2) $e = \frac{\beta}{c}(\frac{c+t_d M_d}{c+t_d})$ to solve for optimal effort to induce:

$$e_O = R'(e_O)\frac{(c + t_O M_O)^2}{c(c + t_O)(c + t_O M_O^2)} \tag{7.10}$$

$$e_N = \frac{R'(e_N)}{c} \tag{7.11}$$

Rearrange these two expressions we obtain:

$$\frac{e_O}{R'(e_O)} = \frac{1}{c}\frac{(c + t_O M_O)^2}{(c + t_O)(c + t_O M_O^2)} \tag{7.12}$$

$$\frac{e_N}{R'(e_N)} = \frac{1}{c} \tag{7.13}$$

We have $e_N \geq e_O$ as $\frac{(c+t_O M_O)^2}{(c+t_O)(c+t_O M_O^2)} \leq 1$ and R'(e) is concave. Note that this holds for any value of M_O.

From (7.2) $\beta_O = R'(e_O)\frac{c+t_O M_O}{c+t_O M_O^2}$ and (7.8) $\beta_N = R'(e_N)$, we can compare the monetary incentives under the two schemes. For $M_O < 1$, we have $\beta_O > \beta_N$. This is because $\frac{c+t_O M_O}{c+t_O M_O^2} > 1$ and $R'(e_O) \geq R'(e_N)$ by concavity of R(e) and the fact that $e_N \geq e_O$. With investment in organizational culture, optimal monetary incentive is lower-powered, while inducing maximum effort. With fully endogenous insider ideal, P uses identity investment to replace the outside ideal of underperformance to induce the efficient level of effort. Parallel to the result from Akerlof and Kranton (2005), lower-power incentives are needed than without organizational culture. This means that when the firm has full influence over effort ideals, monetary incentives and identity investments are always substitutes.

Principal's full influence over agent's effort ideal may not be realistic as discussed in Section 4.1.3. Akerlof and Kranton (2005) cites examples from the military and notes that "military personnel are especially susceptible to indoctrination because of their isolation".

This rarely applies to the civilian workplace. Not only do people spend considerable amount of time outside their work, the firm is also a product of the environment it is in. External factors such as local culture could play a role in the effort ideals workers adopt and lead to "ideal stickiness".

Nonetheless, this robustness check shows the flexibility of our framework. The implications of fully endogenous ideals could be analyzed using exogenous ideal coefficient, where the coefficient M_N is set to 1.

7.2 Endogenous Effort Ideal under Peer Effect

The analysis in Section 4 makes the strong assumption that the ideal effort level is not only positively dependent on incentive pay (the relaxation of which we discuss in Section 7.3), but also depends linearly on both the incentive β and the ideal coefficient M. To relax this assumption, we provide an alternative set-up in which we directly model the peer effect mechanism that has been described previously.

Now assume a continuum of agents of mass 1, with the utility function:

$$U = \alpha + \beta e - \frac{c}{2}e^2 + I_d - \frac{t_d}{2}(M_d\hat{e} - e)^2 \tag{7.14}$$

Here $\hat{e}$ is the average effort of all workers in the firm, and therefore is determined endogenously in equilibrium.

This differs from Section 4 in that the ideal effort is a linear function of the average effort, instead of the previously assumed $\dot{e}$, the effort firm prefers the workers to exert. Therefore, M_d should be interpreted differently. A value of M_d=1 refers to a worker whose ideal effort is to perform at the average level, M_d<1 is a person who prefers to underperform, and M_d>1 refers to a worker who likes to exceed the average effort exerted by his peers.

As before, $e_d = \frac{\beta + t_d(e^*(d))}{c + t_d}$. Each agent takes $e^*(d)$ as exogenous since we have a continuum of agents, and each person's effort does not affect the average effort $\hat{e}$.

Using Rational Expectation Equilibrium and homogenous agents, we have $e^*(d) = e_d$. Dropping d subscripts for simplicity,

$$e = \frac{\beta + tMe}{c + t}$$

$$= \frac{\beta}{c + t(1 - M)}$$

And

$$e^* = M \frac{\beta}{c + t(1 - M)}$$

Clearly the ideal effort e^* is linear in β, and positively depends on M and β. The model that we solved in Section 4 makes assumptions that could be explained by the peer effect mechanism. The difference, however, is that e^* is not linear in M as assumed earlier. This, as we will see, will change the result that we have previously derived.

Now to solve for the monetary incentives provided by the firm, we proceed as before to maximize profit, which gives

$$\beta = \frac{\gamma(c + t - Mt)}{c}$$

$$e = \frac{\gamma}{c}$$

We again returns the result that monetary incentives and organizational culture are substitutes, as β and M are clearly inversely related, if we assume that organizational culture increases the identity coefficient. This should be no surprise. Previously, the effort ideal is assumed to be a fixed M proportion of the effort the firm would like the agents to work at; at low levels of M, monetary and non-monetary incentives need to be used jointly to increase the ideal as high as possible. Under the peer effect model, the firm can always induce the effort the firm would like the agents to work at, by using higher incentives if M_d is low. The effort induced is constant across all values of M_d.

Intuitively, when the ideal depends on the *average* effort, the firm has full control over the effort ideal - the ideal effort and the actual effort can be both simultaneously manipulated. However, in the partial control case when the ideal depends on the *optimal* effort, the agent prefers to underperform by assumption, and therefore the firm cannot successfully manipulate effort ideals to set effort to be $\frac{\gamma}{c}$.

However, if investments in identity changes the responsiveness to agents to identity, then these investments and monetary incentives could be substitutes or complements. The

non-monotonicity of $\frac{d\beta}{dt}$ is robust, and the same as before:

$\frac{d\beta}{dt} > 0$ for M<1

$\frac{d\beta}{dt} < 0$ for M>1

$\frac{d\beta}{dt} = 0$ for M=1

The interpretation, however, is slightly different because of the difference in effort ideal. The results say that if agents prefers to underperform, then any investments in organizational culture that increases responsiveness will be accompanied by larger monetary incentives as they become more effective in increasing the average effort; if agents prefer to overachieve, then with stronger organizational culture, it is better to use low-powered incentives so the workers are not overworked or burnt out.

7.3 Negative Pay-dependency of Ideals

Finally, we discuss the possible implications that arise from negative pay-dependency of ideals. In our current set-up, the two mechanisms discussed, signalling and peer effect, lead to a positive psychological effect. However, depending on the context, there may be other relevant psychological mechanisms through which incentives could have a psychological cost. For example, Benabou and Tirole (2003) shows that if the principal has more information on the nature of the task or the ability of the agent, incentives have a negative psychological effect under the sorting condition in which rewards act as a signal of boring task or low ability.

Even under this alternative assumption of negative pay-dependency, we could still derive similar results on the firm's decision to invest. This is because the role identity plays parallels the case where positive pay-dependency is assumed. Insiders, by definition, will perceive the action of management more positively (or less negatively) and are more likely to react in the way intended by the firm. Therefore, one extension of the model could incorporate psychological costs of incentives for outsiders while keeping other existing set-up including the psychological benefit of incentives for insiders. The other extension is to assume both insiders and outsiders face psychological cost of incentives, but this cost is lower for insiders. In either set-up, the results for conditions under which the firm invests will readily follow because they rest on the comparison between profits under insider and outsider culture, and this relative increase in profit with insider culture has not changed. The negative pay-dependency changes the absolute effect of incentive on ideals, but not the relative effect on

insider and outsider ideals.

For results on the interaction of management practices, the complementarity of identity investment and monetary incentives becomes more likely. This can be easily seen by examining the relationship between incentive and ideal coefficient that we have already derived. Extending Figure 4.1 into the second quadrant where the ideal coefficients M are negative, we can see that the implications are the same as that for M$<\bar{M} = \frac{-c+\sqrt{c^2+ct}}{t}$. This is one instance where negative pay-dependency leads to the complementarity of identity investment and monetary incentives. The answer is not straightforward in a more sophisticated set-up, for example, where the firm faces the insurance/incentives trade-off. An fruitful extension of our model could consider how the firm weigh the costs against the benefits of using strong monetary incentives with identity investment, and analyze the case in which the management practices are substitutes or complements.

8 Conclusion

This paper addresses two questions: 1) why some firms invest in organizational culture 2) how such investments interact with monetary incentives in an identity-based principal-agent framework. It incorporates the psychological effect of monetary incentives through signalling and peer effect, and considers the role identity plays in this process. By assuming a stronger positive effect of incentives on effort ideals internalized by insiders, we find that monetary incentives and investments in organizational culture are not necessarily substitutes. If there is an outsider culture of significant underperformance, these management practices are shown to be complements. The model and its extension yield four testable predictions about conditions under which organizations are more likely to invest in culture: when the outsider culture is to significantly underperform, when cost of implementing organizational culture is low, when the firm can promote a hardworking insider ideal and when the agents are of heterogeneous outsider identities.

To test the predictions of the model, the identity parameters (ideal coefficient M and responsiveness t) need to be measured. This could be done through panel data, surveying workers of different tenure and their perception of the company culture, their responsiveness to its ideals, and their conformity to the ideal level of effort/company standard. Relevant questions to ask include those on job satisfaction, feeling of loyalty towards organization, pride with one's work, and agreement with the values of the organization. If conducted

in several rounds, the survey allows us to examine the change in attitude and behaviour of workers as time progresses. A new hire is more likely to be an outsider than an employee who has stayed in the organization longer. Therefore we could use the data to see how a worker responds to management practices over time. The predictions related to the likelihood of a firm to invest in organizational culture and their use of monetary incentives can be tested through cross-sectional data. It would especially be fruitful to conduct a survey within an industry where both local and foreign firms operate using a range of management practices.

Experiments could shed light on the assumption that applies and test predictions of the model. For example, we could test the pay-dependency assumption in a field experiment by looking at how incentives affect the motivation of people with different identities. To examine the interaction between management practices, we could use an experiment where the subjects are assigned the role of a principal and given the task of motivating an agent of a given identity. We could then examine people's choices when they could use a combination of monetary and non-monetary incentives to motivate the agent, and when they are given the costly option of changing the agent they are dealing with, to one with a different identity.

As we abstracted from the intrinsic value of identity (I_d), the current model does not consider the cost of identity choice. One possible extension is to examine what happens when agents of different given identities interact in the firm setting. For example, in the situation of a merger or acquisition, agents may need to pay a cost to switch identities, which further complicates the identity choice. This can be easily implemented by setting intrinsic value I_d non-zero and not equal between different identities.

Identity also plays a role in various other principal-agent problems such as screening and career concern to be examined in future research. If firm has a preference for identity of the worker (identity as a source of heterogeneity in addition to ability), then this will affect the matching between firms and workers. In standard models, career concern in second period creates implicit incentive for workers to exert higher effort in the first period. This assumes agents' type is one-dimensional, but there could be a second dimension - whether the worker believes in firm's values. Career concern, therefore, has a second dimension if firm does not necessarily promote those with highest ability, but also considers their fit with the organizational culture. In the case where insiders are favoured, they are more likely to be awarded a promotion and a more beneficial package. This creates greater career concerns for insiders.

The implications of our model extend to how firms should implement organizational culture. To explore the peer effect mechanism, for example, management should foster a collaborative work environment. This provides an opportunity for employees to not only interact, but actually care about each other.

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