Managing Relational Contracts

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Teaching note

This paper can be taught when talking about the following topics:

- **Incentives in hierarchies**: how effort is incentivized in hierarchical organizations that operate in informal environments

- **Management**: how to reward managers who may be susceptible to corruption

- **Corruption**: how to set governance policies in organizations that use informal incentives in corrupt environments

- **Development**: how reliance on relational contracts can limit firm growth and facilitate corruption

Introduction

- Informal relationships play a crucial role within and between firms
- These relationships are often delegated to managers who may want to use the informal relationships to collude against the firm's interests
- Aéropostale provides an example of the situation we are capturing in our model

Aéropostale

- Aéropostale is a retailer of teen apparel
- In 2006, the firm accused its chief merchandising manager Christopher Finazzo of:
  - inflating prices to its main supplier, South Bay
  - receiving more than $25 million in kickbacks from that supplier

Aéropostale

Finazzo argued that:

- South Bay's products were of higher quality
- South Bay was willing to hold and store inventory, which allowed Aéropostale to "*quickly start printing new styles*" $\Longrightarrow$ very valuable to adapt to its "*fickle*" teenage customer base
- Aéropostale is "*loyal*" and "*committed*" to long–time vendors even when those vendors "*encountered production difficulties*" and even if that meant "*paying higher prices*" Case No. 14-3213-cr(L)

Aéropostale

- Finazzo and South Bay were found guilty of fraud in 2013
  - restitution $\rightarrow$ *"the value of the kickbacks"* was used as *"a reasonable measure of the pecuniary loss suffered"*
- They appealed the restitution amount and in 2017 the Court of Appeals for the Second Circuit demanded a recalculation
- Judge Droney argued that:
  - it was possible "*that Aéropostale did not lose money as a result of this corrupt arrangement*"
  - Finazzo's *"conduct may have reduced transactions costs for South Bay"* and the relationship may have made it profitable for South Bay to pay kickbacks even at non-inflated prices

Procurement relationships and trust

- Relational contracts between organizations are ubiquitous and are crucial for enforcing promises
- Indeed, *"lack of trust and commitment"* is behind most supplier collaboration failures Webb (2017)

Procurement relationships and trust

- The task of maintaining these relationships is often delegated to a manager like Finazzo
- As ilustrated by Aéropostale's case, the firm can never guarantee that the manager will exclusively act in the firm's best interest
- What happens if this trust is used by managers to collude with suppliers?

This paper

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- The principal delegates the implementation of the incentive relational contract to a manager
  - Same technology: everything the manager does, the principal can do it herself if she does not delegate
  - In particular, the manager is self-interested, strategic and carries out payments without commitment just as the principal would
  - Key difference: she receives a share of the principal's payoff

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- Manager can engage in taking (relational) bribes from agent

Questions and answers

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- Is it still the case that a more valuable relationship sustains more effort?

$\Longrightarrow$ No, a more valuable relationship can lead to less effort

- Should a principal delegate relational contracts?

$\Longrightarrow$ Yes, when relational contracts are difficult

Literature

Relational contracts

- Extend Levin (2003) by adding a manager
- Literature focuses on delegation to agent (Goldlucke & Kranz 2012; Li et.al., 2014)
- Exception: in Fong and Li (2016) a non-strategic manager can garble agent's evaluations intertemporally

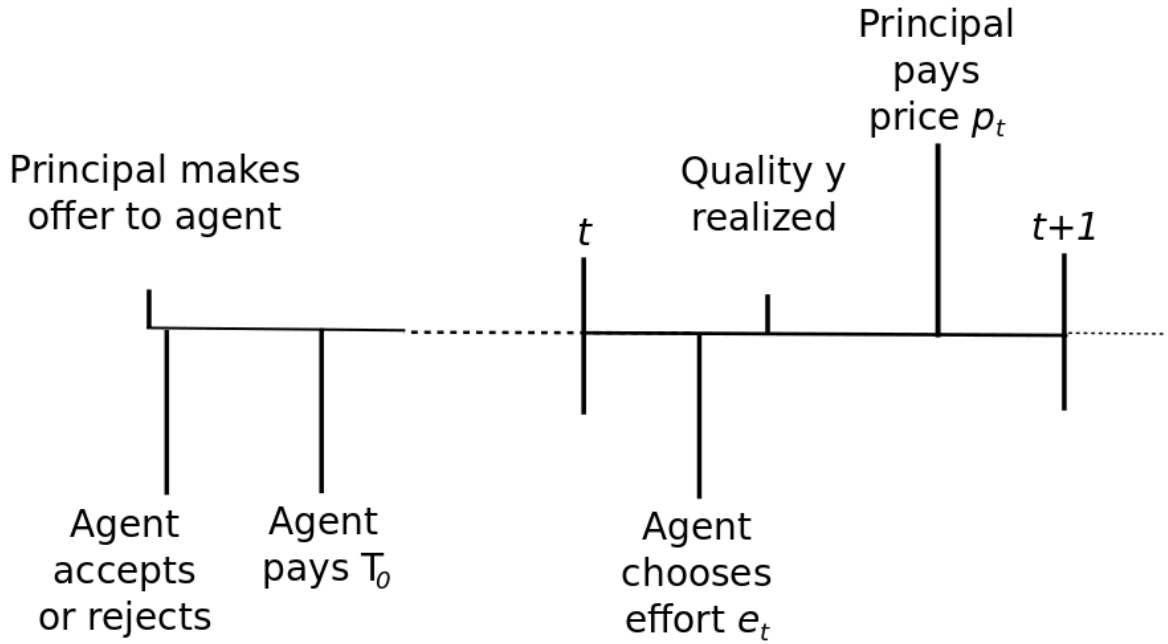
Collusion in hierarchies

- Many models assume enforcement of collusion (e.g. Tirole, 1986; Banerjee, 2012). Few exceptions (Martimort 1999, Buccirossi and Spagnolo 2001). None considers good side of repeated interaction (new role for bribes).
- Supervisor has the same "technology" as principal, but a different payoff as in the **delegation** literature (e.g. Vickers, 1985; Katz 1991). First to consider corruption as a tool to influence the manager's payoff

Model

No delegation

Principal and agent interact repeatedly as in Levin (AER,2003)



- Agent pays upfront transfer T_0
- Agent exerts private effort e_t at a cost $c(e_t)$
- Everyone observes a non-verifiable quality y with probability e_t (and no performance otherwise)
- Principal makes discretionary payments p_t

Delegation: initial period

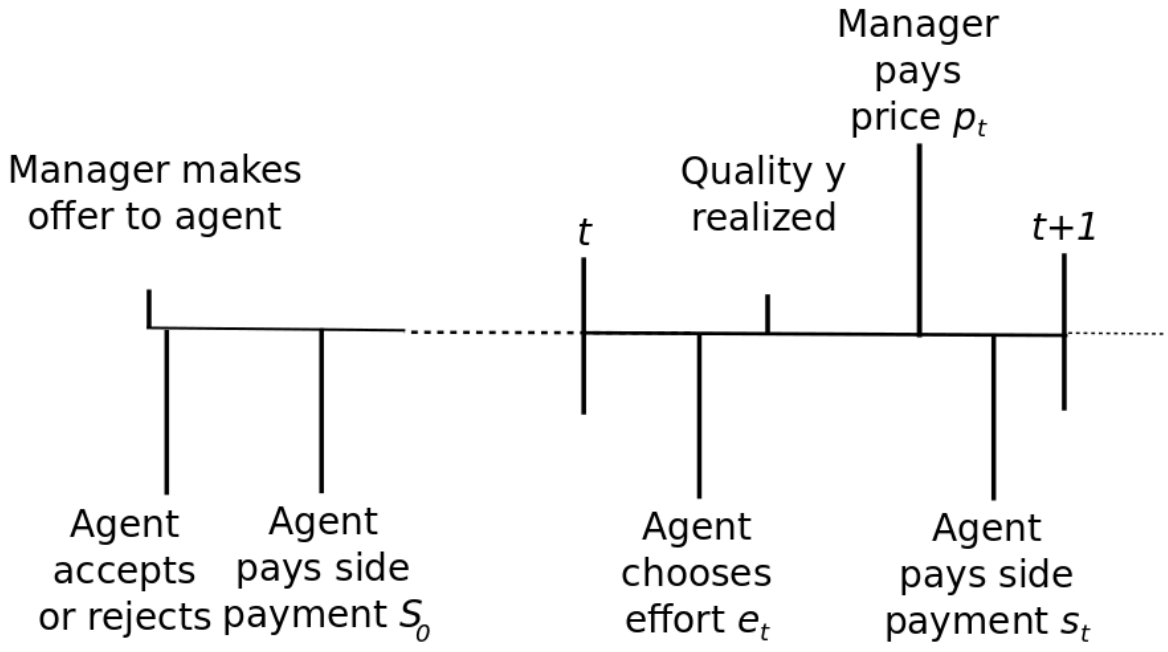
Principal hires a manager to incentivize the agent

At time $t = 0$:

- Principal chooses some parameters of the contract:
  - Share of her profits that the manager receives α
  - Limits the manager discretion by setting a maximum price $\overline{p}$
- All these are assumed to be stationary and can be enforced by the court
- Principal takes no further action
- In the model, we can have N agents

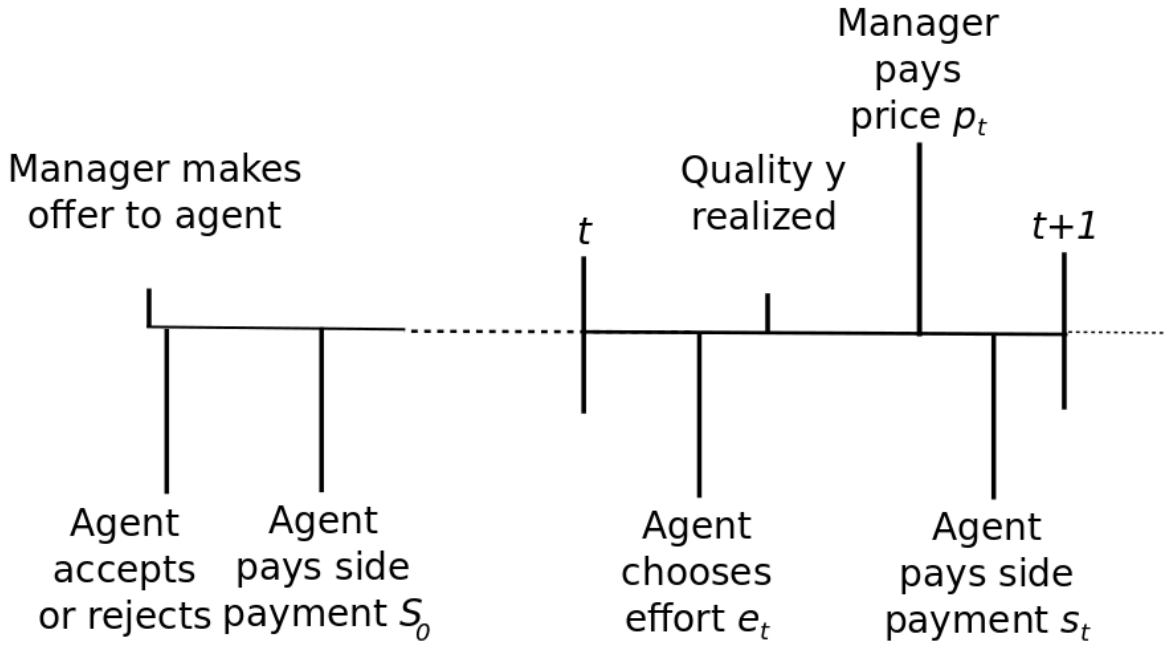
▸ More

Delegation: managed relational contract



- Manager/agent makes upfront side payment S_0
- Manager and agent interact repeatedly
- Agent exerts private effort e_t at a cost $c(e_t)$

Delegation: managed relational contract



- Manager and agent observe a non-verifiable quality y with probability e_t (and no performance otherwise)
- Agent receives discretionary payments $p_t \leq \overline{p}$ chosen by the manager
- Manager/agent make discretionary side payments s_t

Payoffs with delegation

Principal's payoff:

$$\pi_t = E\left[(1-\delta)(1-\alpha)(y_t - p_t) + \delta\pi_{t+1}\right]$$

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Manager's payoff:

$$v_t = E\left[(1-\delta)\left[\alpha(y_t - p_t) + s_t\right] + \delta v_{t+1}\right]$$

Payoffs with delegation

Principal's payoff:

$$\pi_t = E\left[(1-\delta)(1-\alpha)(y_t - p_t) + \delta\pi_{t+1}\right]$$

Manager's payoff:

$$v_t = E\left[(1-\delta)\left[\alpha(y_t - p_t) + s_t\right] + \delta v_{t+1}\right]$$

Agent's payoff:

$$u_t = E\left[(1-\delta)\left[p_t - s_t - c(e_t)\right] + \delta u_{t+1}\right]$$

where the outside options are normalized to 0 and δ is the discount factor

Results

No delegation (Levin, 2003)

▷ Optimal contract is stationary: $p_l = 0$ and p_h limited by $-p_h + \frac{\delta\pi}{1-\delta} \geq 0$

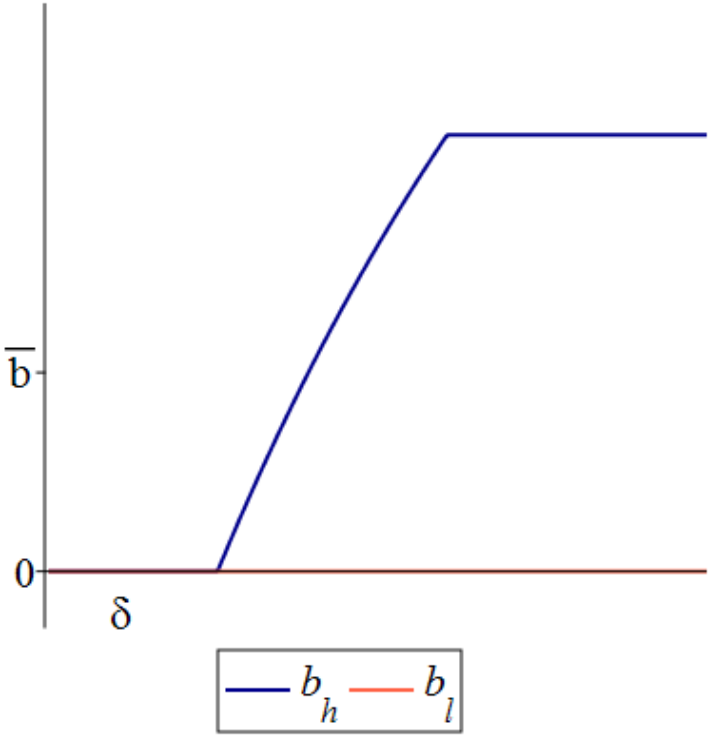


Figure: Price premium

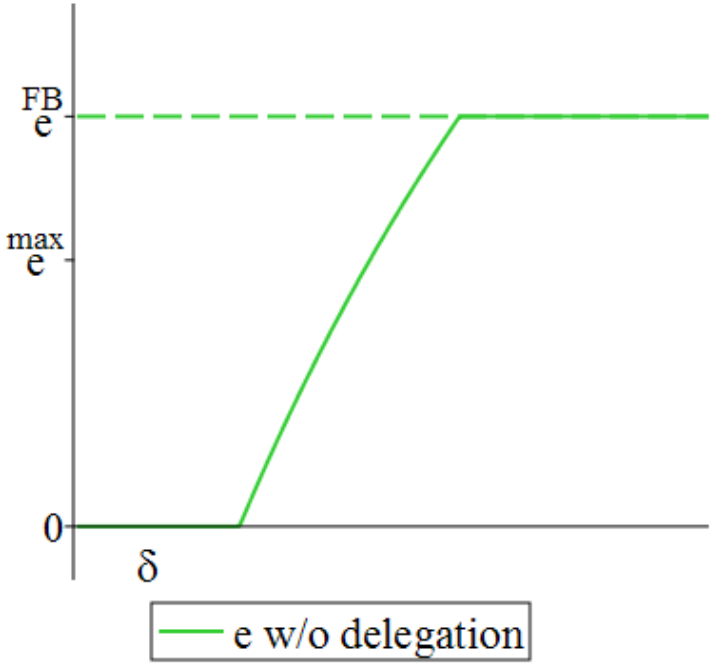


Figure: Effort

What is the optimal relational contract between the manager and the agent?

Managed relational contract

▷ Manager can motivate agent with price premium, $p_h \geq p_l$, AND side payments $s_l \geq s_h$

▷ Manager has a comparative advantage enforcing p_h

$$-\alpha p_h + s_h + \frac{\delta v}{1-\delta} \geq 0 \qquad (DE_{price})$$

Managed relational contract

▷ Manager can motivate agent with price premium, $p_h \geq p_l$, AND side payments $s_l \geq s_h$

▷ Manager has a comparative advantage e[illegible]

No delegation case: $-p_h + \frac{\delta\pi}{1-\delta} \geq 0$

$$-\alpha p_h + s_h + \frac{\delta v}{1-\delta} \geq 0 \qquad (DE_{price})$$

▷ Cole and Tran (2011) document how side payments are used as an enforcing mechanism

> *When* **quality is not contractible**, *the client holds "back roughly 20 percent of the contract value (...), until the client is satisfied that the product meets the specified quality". However, the* **"kickback is paid only after all contract payments have been made"**

The problem

- We show that the manager and agent maximize their joint surplus:

$$g = \alpha e y + (1-\alpha)(e p_h + (1-e) p_l) - c(e)$$

- For a given e:
  $\Longrightarrow$ Side payments do not affect surplus
  $\Longrightarrow$ Price premiums increase surplus: $\downarrow p_l$ helps incentive provision but directly lowers surplus
  $\Longrightarrow$ Side payments first, price premiums last! ▸ Full problem

▸ More

Delegation

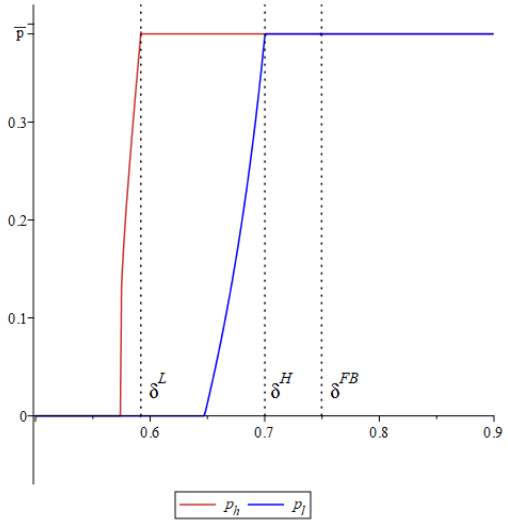


Figure: Price premium

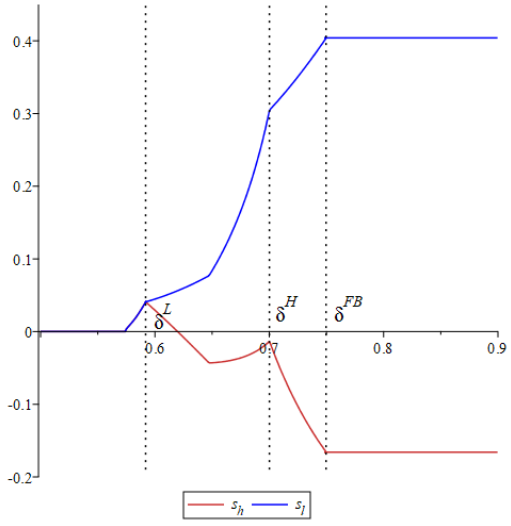


Figure: Side Payments

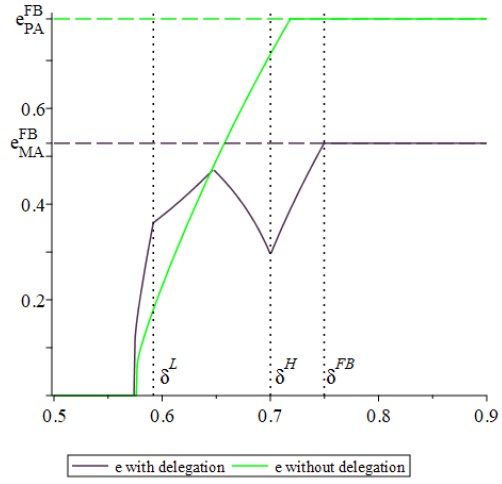
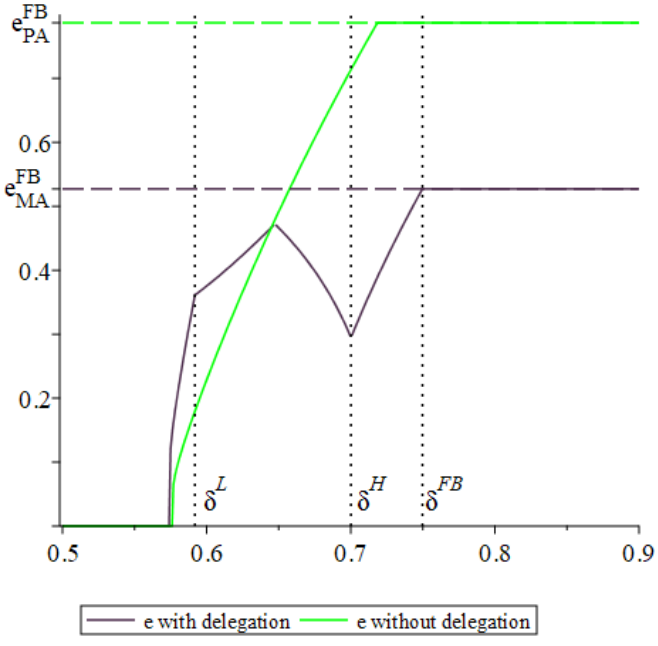


Figure: Effort

Encouraging relationships and effort



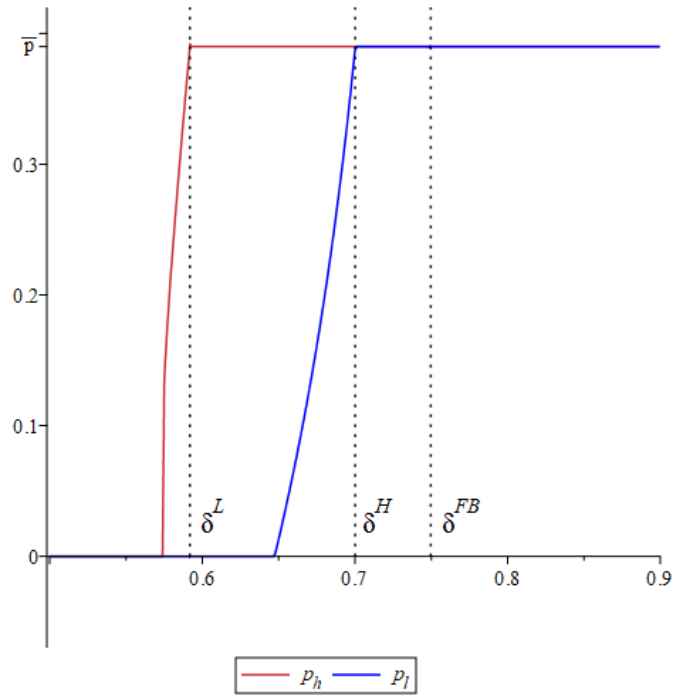
Guanxi is a system of trust-based informal relationships used to enforce contracts in China

"it would be naive to think—as many Western executives do—that the more guanxi you have on the front lines in China, the better". It can "divide the loyalties of the sales and procurement people" Vanhonacker (2004)

Back to Aéropostale

- In 2005 and 2006, South Bay had delivery delays "*that cost Aéropostale approximately $1.8 million in lost sales*"
- A product manager suggested discounts "*to compensate for the delays*" but Finazzo refused it

Our model suggest that ...
Finazzo had very
high surplus



What is the optimal delegation arrangement?

Governing managed relational contracts

- How should the principal set α and $\overline{p}$?

Governing managed relational contracts

- How should the principal set α and $\overline{p}$?
- To prevent the manager colluding with the agent to pay a premium price for low quality $p_l > 0$
- When the "collusive" motive appears, the principal limits $\overline{p} \rightarrow$ in the limit, the agent will have no discretion
- At this point, incentives are provided exclusively via side payments $\rightarrow$ Ledeneva (2013) finds evidence that, in Russian procurement, kickbacks were "*linked to performance and facilitated the quality of service*"
- Collusion is still costly for the principal because it forces her to decrease the discretion available to the manager

▸ More

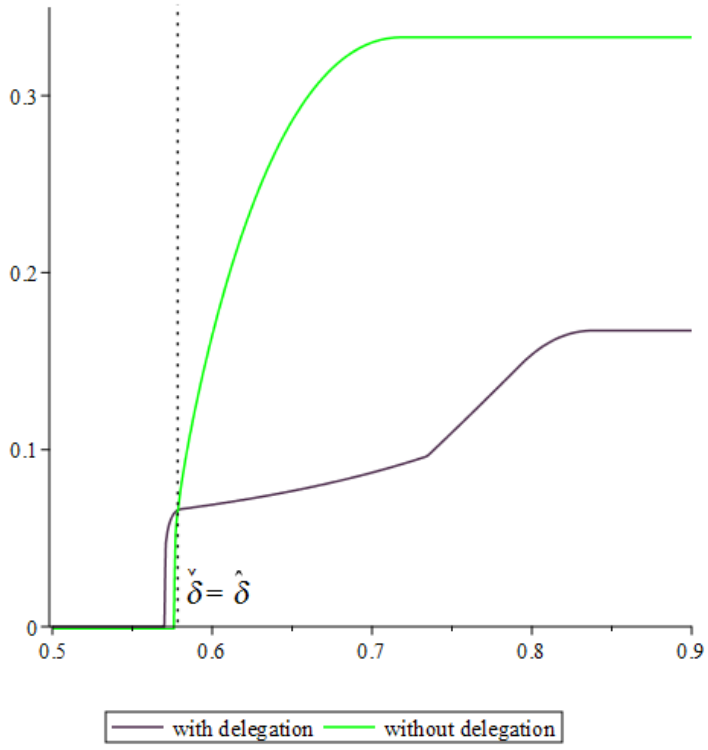
When should the principal employ a manager?

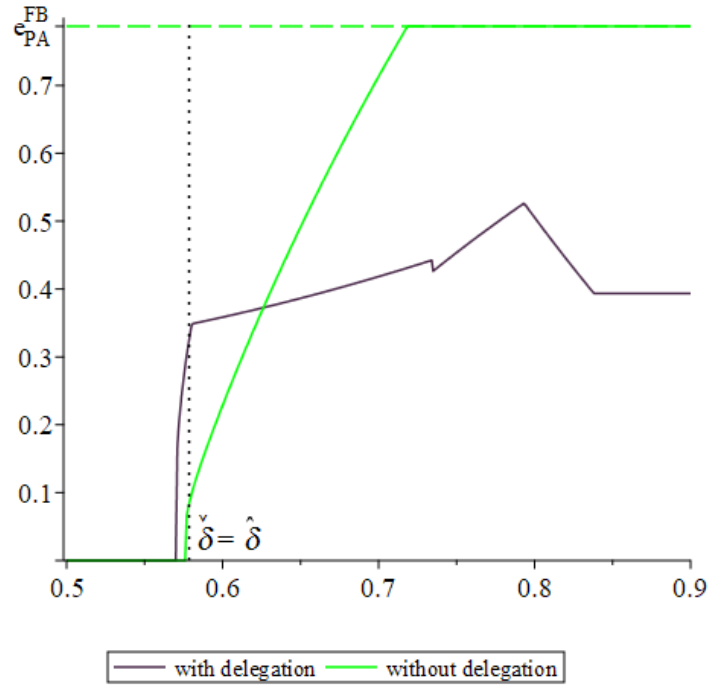
When should the principal employ a manager?

- Sometimes the principal must entrust the relationship to the manager...
  ... but sometimes she can choose to manage it herself
- Potential collusion is a concern: Indian firm-owners "*were concerned if they let their plant managers procure yarn they may do so at inflated rates from friends and receive kickbacks*" Bloom et al. (2013)

When should the principal employ a manager?

The principal benefits from delegating if relational contracting is difficult: δ or y is low or $\underline{u}$ is high





Costly corruption

- Suppose that when the agent pays S, the manager only receives κS for $0 < \kappa \leq 1$
- Manager has bargaining power
- When side-payments are more costly ($\kappa \downarrow$), principal shares less profit with the manager, delegation is more attractive, and it involves greater effort
  - If risk of corruption $\downarrow \Longrightarrow$ principal can set a lower α and still avoid $p_l > 0$
  - Since α is lower, manager-agent relational contracting is easier $\Longrightarrow$ principal can transfer less surplus to the manager
- Bloom, Sadun and Van Reenen (2012): firms delegate more when there is stronger rule of law or better monitoring practice

Take-away messages

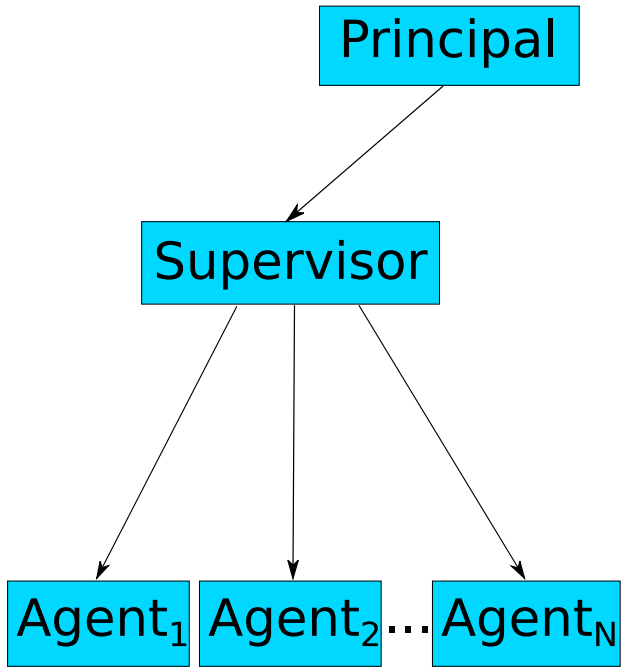
- First to study the impact of collusion on relational contracts
- Collusion can crowd out productive effort when the relationship between manager and agent is too strong
- When trust is a scarce resource, managed relational contracts are more credible and can incentivize more quality than direct relational contracts
- A principal delegating optimally will constrain the manager's discretion so as to prevent overpayment $\rightarrow$ delegation may or may not benefit the principal
- The model backs Judge Droney's argument that the *"negative correlation"* between kickbacks and loss may not exist

Multi-tasking

- Suppose the agent can undertake two tasks:
  - e_1 that benefits the principal by generating y with probability e_1
  - e_2 that benefits the manager by an amount $f(e_2)$
- The tasks are substitutes $c(e_1, e_2)$
- For simplicity, the manager observes so $p = c(e_1, e_2)$
- The manager's payoff: $\alpha(ye_1 - b) + f(e_2)$
- We show that if relational contracts are difficult, $\downarrow \alpha$ is beneficial for the principal because it facilitates e_1
- Mechanism: $\uparrow$ the value placed on collusion as compared to the principal, enhances the manager credibility

Many agents

- Principal, manager and N technologically independent agents
- Bilateral relational contracting with each agent by Levin (2002)



Many agents

- e_{it} only observed by agent i
- y_{it} observed by agent i and manager but non-verifiable
- $Y_t = \sum_{i=1}^{i=N} y_{it} + \epsilon_t, \epsilon_t$ iid with $E(\epsilon_t) = 0$ observable & verifiable

$\Longrightarrow$ The results are unaffected in this new model

$\Longrightarrow$ Output-sharing with the agents:

- $(+)$ Agents are also motivated with the output share $\rightarrow$ relational contracts are relaxed $\rightarrow -$ effective as $\uparrow N$ because moral hazard in teams
- $(-)$ Each manager-agent relation has now less joint surplus $\rightarrow$ relational contracts are tightened $\rightarrow +$ important as $\uparrow N$

$\Longrightarrow$ If N is large enough, it is optimal to share output only with the manager Back

Complete problem

- Consider a manager-agent contract that in its first period calls for payments $p(y)$, $s(y)$ and effort e
- If the offer is made and accepted and the discretionary payments made, the continuation contract gives payoffs $u(y)$, $v(y)$ as a function of the observed outcome y
- Let u, v be the expected payoffs under this contract:

$$u \equiv (1-\delta)E\left[p(y) - s(y) - c(e)|e\right] + \delta E\left[u(y)|e\right]$$
$$v \equiv (1-\delta)E\left[\alpha(y - p(y)) + s(y)|e\right] + \delta E\left[v(y)|e\right]$$

- We follow Levin (2003) in defining this contract as *self-enforcing* if and only if the following conditions hold

A self-enforcing contract satisfies:

i Parties willing to initiate the contract: $u \geq \underline{u}$ and $v \geq 0$

ii The agent is willing to choose e:

$$e \in \arg\max_{e} E\left[p(y) - s(y) + \frac{\delta}{1-\delta}u(y)|e\right] - c(e)$$

iii For all y, both parties willing to pay p:

$$(1-\delta)\left(-\alpha p(y) + s(y)\right) + \delta v(y) \geq 0 \qquad (DE_{price})$$

$$(1-\delta)\left(p(y) - s(y)\right) + \delta u(y) \geq \delta \underline{u} \qquad (X)$$

iv For all y, both parties willing to pay s:

$$(1-\delta)s(y) + \delta v(y) \geq 0 \qquad (X)$$

$$-(1-\delta)s(y) + \delta u(y) \geq \delta \underline{u} \qquad (DE_{bribe})$$

v Each continuation contract is self-enforcing: $u(y)$, $v(y)$ correspond to a self-enforcing contract that will be initiated in the next period ▸ Back

Types of contracts

Proposition

For a given α and $\overline{p}$, $\exists \left(\delta^L, \delta^H\right)$ s.t. optimal manager-agent relational contract is characterized as follows:

- *If $\delta \geq \delta^H$: Prices are not used to induce effort and effort is weakly increasing in δ*
- *If $\delta^H > \delta > \delta^L$: Both side payments and prices are used to induce effort. If $p_l > 0$, then effort is decreasing in δ, and otherwise it is increasing in δ*
- *If $\delta \leq \delta^L$: Side payments are not used to induce effort and effort is weakly increasing in δ*

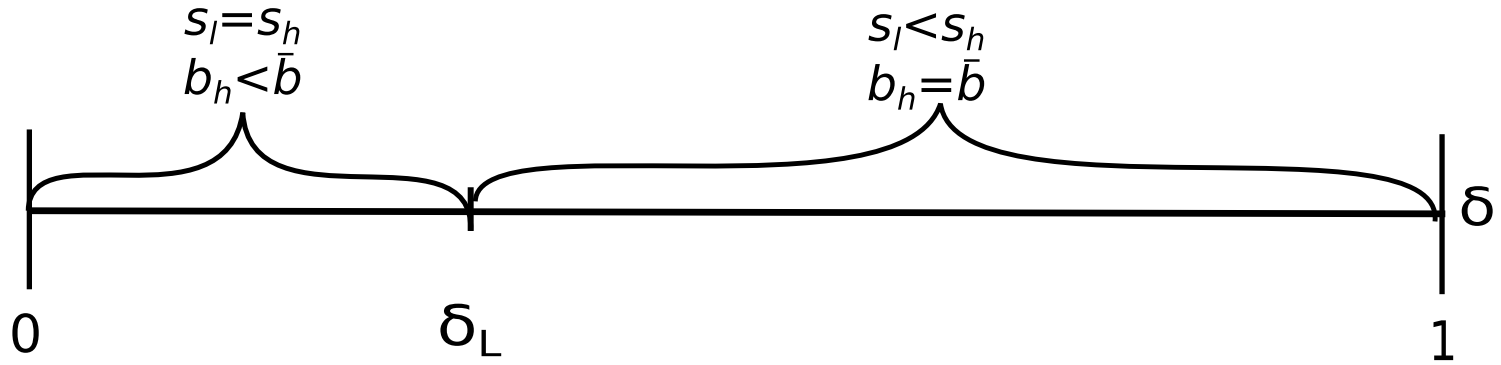
Sketch proof of Proposition 1

Finding δ^L

- Effort and surplus are increasing p_h
- $\uparrow p_h$ and $\uparrow s_h$ by the same amount without violating (DE_{bonus})
  $\Longrightarrow$ Hence, $\uparrow p_h$ up to $\overline{p}$, unless $\uparrow s_h$ is not possible (i.e. $s_h = s_l$). Then p_h is bounded by $(IC - DE)$:

$$p_h = \min\{\overline{p}, \frac{1}{\alpha}\frac{\delta g}{1-\delta}\}$$

- Since g is increasing in δ, δ^L uniquely defined by: $\overline{p} = \frac{1}{\alpha}\frac{\delta^L g}{1-\delta^L}$



Sketch proof of Proposition 1

Finding $\delta^{\mathbf{H}}$

- If $\delta^L \leq \delta$, manager solves:

$$\max_e g(e, \overline{p}, p_I) \text{ subject to}$$

$$p_I = \frac{\delta g(e, \overline{p}, p_I)}{1-\delta} + (1-\alpha)\overline{p} - c'(e) \text{ by } (IC - DE)$$

$$0 \leq p_I \leq \overline{p}$$

- We show that:
  - if $p_I = 0$ at δ, then $p_I = 0$ for all δ below
  - if $p_I = \overline{b}$ at δ, then $p_I = \overline{p}$ for all higher δ
- δ^H is the smallest δ such that the optimal solution is $p_I = \overline{p}$

Sketch proof of Proposition 1

Relationship between e and δ

- If $\delta \geq \delta^H$, then e is given by $(IC - DE)$: $\frac{c'(e)+\alpha\overline{p}}{g(e,\overline{p},\overline{p})} = \frac{\delta}{1-\delta} \Longrightarrow$ LHS is increasing in e so $\uparrow \delta \Longrightarrow \uparrow e$
- If $\delta \leq \delta^L$ and $p_l = 0$, then e maximizes $g(e, \frac{1}{\alpha}\frac{\delta g}{1-\delta}, 0) \Longrightarrow \uparrow \delta \Longrightarrow \uparrow$credible p_h and hence $\uparrow e$
- If $\delta^L < \delta < \delta^H$, then p_l and e given by:

$$p_l = \frac{1-\alpha}{\alpha}(1-e)\,c''(e) - y + \frac{1}{\alpha}\frac{\delta g(e, p_h, p_l)}{1-\delta} \text{ or } p_l = 0$$

$$c'(e) = \overline{p} - p_l + \frac{\delta g(e, \overline{p}, p_l)}{1-\delta} - \alpha\overline{p} \quad (IC - DE)$$

$\Longrightarrow$ When $p_l = 0$, from $(IC - DE)$ we see that $\uparrow \delta \Longrightarrow \uparrow e$

$\Longrightarrow$ When $p_l > 0$,

$c'(e) + \frac{1-\alpha}{\alpha}(1-e)\,c''(e) = (1-\alpha)\,\overline{p} + y - \frac{1-\alpha}{\alpha}\frac{\delta g(e,\overline{p},p_l)}{1-\delta}$ and

$c'(e) + \frac{1-\alpha}{\alpha}(1-e)\,c''(e) \uparrow$ if p_l interior, hence $\uparrow \delta \Longrightarrow \downarrow e$

Back

Governing supervised relational contracts

Proposition

The principal sets α and $\overline{p}$ such that $p_l = 0$. $\exists$ (δ_L, δ_H) s.t. optimal manager-agent relational contract is characterized as follows:

- *If $\delta \geq \delta_H$: only side payments are used to induce effort and $\overline{p} = 0$*
- *If $\delta_H > \delta > \delta_L$: side payments and bonuses are used to induce effort*
- *If $\delta \leq \delta_L$: only bonuses are used to induce effort*

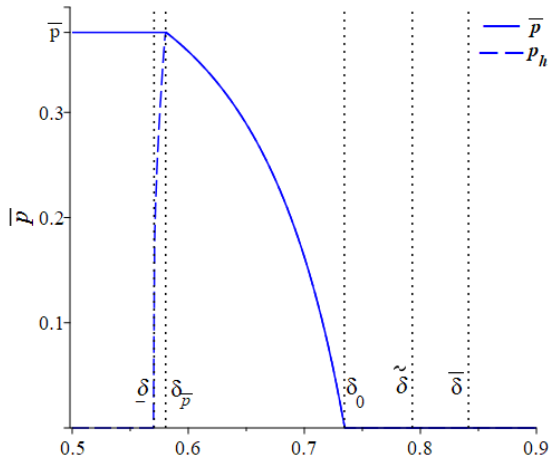


Figure: Price premium

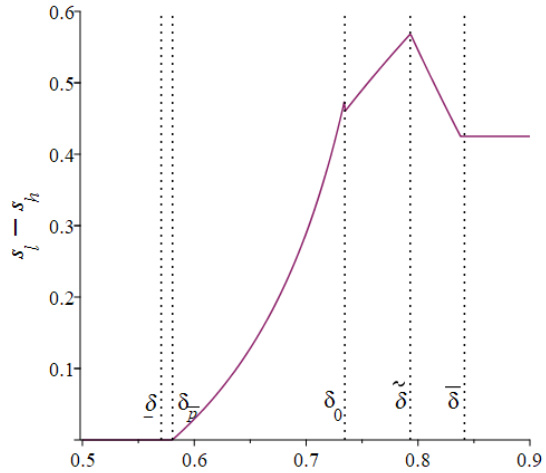


Figure: Side Payments

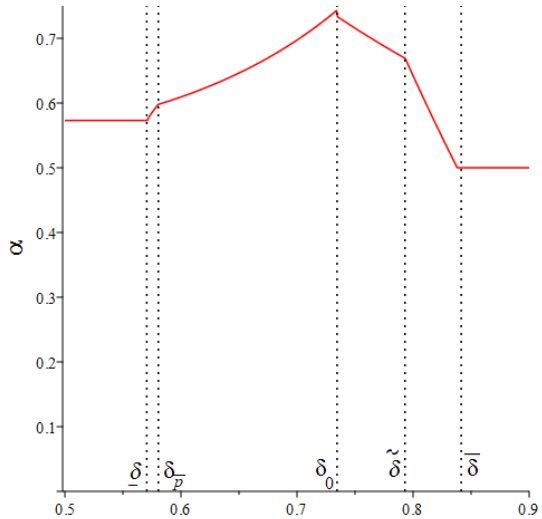


Figure: Alpha

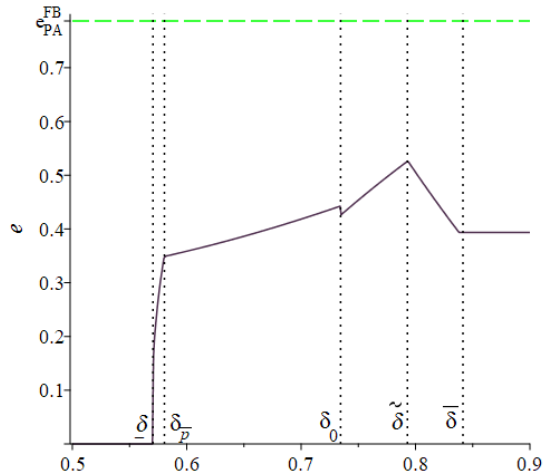


Figure: Effort

Credit Suisse First Boston

- The management of First Boston (FB), the manager, had been very successful at maintaining long-term relationships with its bankers

Credit Suisse First Boston

- The management of First Boston (FB), the manager, had been very successful at maintaining long-term relationships with its bankers
- **But also**, there was hierarchical collusion to oversell:

  "So much of communication wasn't captured in e-mails or directly mentioned in meetings. It was implicit—understood without words. If your chairman asked you to take a look at a stock, (...) you didn't need to be told explicitly what to say or write. It was understood, (...) that you were to comply by lavishing the stock or the deal with positive comments" Prins (2006)

Credit Suisse First Boston

- CS introduced measures to change the: *"freewheeling atmosphere (...) notable for an absence of the layers of controls... [and] for huge salaries and bonuses."* Stewart (1993)

Credit Suisse First Boston

- CS introduced measures to change the: *"freewheeling atmosphere (...) notable for an absence of the layers of controls... [and] for huge salaries and bonuses."* Stewart (1993)
- It imposed a tighter bonus cap, and as a result, FB top management could not longer pay bonuses they felt were sufficient to reward their employees $\Longrightarrow$ *one manager "was so upset over the bonuses for his people that he dipped into his own pocket to pay them more"* Stewart (1993)

Proof:

- If $p_l = p_h$, then $(IC - DE)$ is $c'(e) = \frac{\delta g}{1-\delta} - \alpha p_h \Longrightarrow$ principal can do better by setting $\overline{p} = 0$ and increasing α to keep g constant
- If $0 < p_l < p_h$, the principal chooses parameters so that the contract has $p_l = 0$
  - $\hookrightarrow$ Suppose $p_l > 0$, then she can $\downarrow \overline{p}$ and $\uparrow \alpha$ so the manager is forced to use the same price variation with $p_l = 0$

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