Principal Agent Paradigm

Under an agency relationship, one party, the principal, hires another party, the agent, to perform some task.

Agency problems occur when the agent does not have the same preferences as the principal.

The agent faces a moral hazard problem because she is confronted with the dilemma of doing what's best for her or what's best for the principal. Economists put moral issues aside and assume that the agent does what’s best for her.

What can the principal do to address the problem? (a) Find a perfect agent: Selection or screening. (b) Get the right behavior: Incentive provision.
Short-Term Incentives: Piece Rates and Bonuses

Piece rates pay workers based on the amount of output they produce regardless of the amount of time actually worked.

Bonuses are lump-sum payments (made in addition to other forms of compensation) usually conditional on some kind of performance evaluation.

The common point to piece rate and bonus is that they provide short term performance incentives.
Short-Term Incentives: How does it work?

The principal (e.g. firm) cannot observe the agent’s (e.g. worker) effort or true contribution

The firm observes only an imperfect measure of effort (e.g. profits, sales...)

The performance measure is a function of the worker’s effort and also some random noise

For example, a CEO’s performance depends on the level of industry competition, a sales person performance depends on the product sold, a farmer’s output depends on the weather...
Two effort levels and two outcomes model

The worker can either supply high \((e_H)\) or low effort \((e_L)\) and this decision is not observed by the principal. The cost of effort \(e\) is \(g(e)\) such that \(g(e_H) > g(e_L)\) and we denote the incremental cost of effort \(c = g(e_H) - g(e_L)\). The worker has reservation utility \(u\)

The principal observes a performance outcome that can be either high or low. \(p_H\) and \(p_L\) are the probability of high performance under high and low efforts respectively. High effort is more likely to generate high performance \(p_H > p_L\). Perfect performance measure has \(p_H = 1\) and \(p_L = 0\)

The principal makes an offer which consists in a fixed salary \(s\) plus a bonus \(b\) if performance is high
Timing of events:

1. Firm sets the compensation policy

2. Worker chooses effort level

3. Nature draws performance according to probability conditional on effort

4. Worker gets compensated
Analysis

Assume there is no performance bonus \((b = 0)\)

Since \(s - c < s\) the worker prefers to supply low effort

The worker will not supply effort unless \(s + p_Hb - c > s + p_Lb\).

The lowest bonus such that \(e_H\) is incentive compatible is,

\[
b = \frac{c}{p_H - p_L}
\]

The incremental benefit of supplying effort has to be greater than (or equal to) the incremental cost of doing so

Under perfect performance measure \((p_H = 1, p_L = 0)\) the bonus is equal to the cost of effort \(b = c\)
The more noisy the performance measure (\(p_H - p_L\) low) the greater the bonus \(\frac{\partial b}{\partial (p_H - p_L)} < 0\).

The worker earns \(s + b\) with probability \(p_H\) and \(s\) with probability \(1 - p_H\). The principal sets the fixed salary \(s\) such that the worker is indifferent between working under contract \((s, b)\) and the outside option \(u = p_H(s + b) + (1 - p_H)s - g(e_H)\) or

\[
s = u + g(e_H) - p_Hb
\]

A risk averse worker gets disutility from incentive compatible compensation since pay is variable.
Understanding Firms: Key Questions

Boundaries of firms: Explain make-or-buy decisions. This corresponds to the choice between internal transaction (vertical integration), market transactions (vertical separation), and long-term contracts (intermediate).

Other questions: (a) explain why ownership matters, (b) give an economic meaning to authority, (c) explain the role of residual rights in corporate finance.

Different views of firms

Neoclassical theory: production theory has little to say about firms besides optimal production plant size based on concept of scale economies. Theory of production scale not of firm boundaries.
Agency view: incentives problems are addressed with contracts. However, contracts can be written within or across firms without distinctions.

Neither neoclassical theory or agency theory address the issue of firm boundaries and asset ownership.

Transaction Cost Economics (TCE): Study differences between internal and market transactions. Initiated by Coase (37) and developed by Williamson (79).

Property Right Theory (PRT): Study who should own what asset? Grossman-Hart (86) and Hart (95).
TCE and PRT: Main Concepts

(1) Specific investment and lock-in. (2) Incomplete contract and bounded rationality. (3) Quasi rent and hold-up problem. (5) Survivor principle

Specific investment and lock-in

Investment in transaction specific assets that improve the efficiency of a given transaction more than other transactions. Examples include site specificity (mine mouth), specialized equipment or skill (GM and Bodyparts), dedicated capacity (reliance on single buyer)

As a consequence, the value of a relationship is greater than the value of outside alternatives
Incomplete contracts

Impossibility to contract on all future contingencies. This could be because of difficulty to specify or verify all future states of the world, bounded rationality, or unforeseen contingencies

States of the world or actions may be observable but not contractible

There will be a desire to renegotiate to capture all gains from trade that materialize after the specific investments have been made

Quasi rent and hold-up
Quasi rents are rents from relationship relative to next best alternative. A firm holds-up its partner or behaves opportunistically if it tries to renegotiate the terms of a deal to capture the value of investments made by its partner

**Survivor Principle**

Inefficient governance structures are weeded out by competitive forces. Selection implies that only those structures that maximize social welfare should survive. Compare social welfare under different governance structures and predict that those that generate the highest surplus should survive

**What distinguishes TCE and PRT?**

TCE and PRT differ in how they factor in contract incompleteness
TCE assumes that the ex-post bargaining costs depend on ownership structure (internal organization reduces these costs).

PRT assumes that the nature of the ex-post bargaining game is identical in all ownership structures, but outside options are different and depend on ownership structure.
Transaction Cost Economics: Theory

Coase asked why firms exists given efficiency of competitive market mechanism. His answer was that there were transaction cost of using the market (e.g. negotiating, writing and enforcing contracts) and internal organization could save on transaction costs. He pointed out toward a trade-off between low-powered incentives under integration and ex-post haggling cost over quasi-rents (and these costs will depend on the level of quasi-rents) as well as ex-ante under-investment in quasi-rents under separation. Although vertical integration reduces inefficient opportunistic behavior to capture quasi-rents, and internalizes the value of transaction specific investments, it does not provide strong incentives.

A model of hold-up (see BD 12.3)
The hold-up problem not only generate haggling costs under market transactions but also generate inefficient investments. To illustrate, consider a buyer and seller who invest $a_b$ and $a_s$ to increase the value of future trade. Under these investments, the buyer and seller can produce a good worth $R(a_b)$ to the buyer at cost $c(a_s)$ to the seller with $R' > 0$, $R'' < 0$ and $c' < 0$, $c'' > 0$. If trade takes place at transfer price $t$ the buyer gets $R(a_b) - a_b - t$ while the seller gets $t - c(a_s) - a_s$. Investments are non-contractible are relationship specific.

The first best investment maximizes $R(a_b) - a_b - c(a_s) - a_s$ and set $R'(a_b^*) = 1$ and $c'(a_s^*) = -1$.

Assume both parties make investments ex-ante anticipating that they will negotiate over the surplus ex-post. Assume they split the surplus equally (Nash bargaining). Then the buyers maximizes $\frac{1}{2}(R(a_b) - c(a_s)) - a_b$ while the seller maximizes...
\[ \frac{1}{2}(R(a_b) - c(a_s)) - a_s. \] Let \( a_b^m \) and \( a_b^s \) represent the investments under market transaction.

Investments are inefficiently low under ex-post negotiation

\[ a_b^m < a_b^* \text{ and } a_s^m < a_s^* \]

This is known as the hold up problem. The inability to contract ex-ante on investments together with ex-post opportunism causes under-investment.

**Prediction**

Identify measures of potential opportunistic behavior due to specificity (quasi-rents) and ambiguity (incompleteness): lock-in, product specificity, contract incompleteness.
Identify vertical choice: integration versus separation, length of contract, repeated interaction

Study association between specificity/incompleteness and vertical relation (integration, separation, length of contract)

**Evidence**


See also review in Chiappori-Salanie (Hubbard (1999) finds that spot arrangement in trucking are more common in thicker markets.  Croker-Masten (1988) finds that price ceiling shorten contract duration by half)
Joskow

Specificity: Site specificity (mine mouth), Physical asset specificity (plant designed for a specific type of coal), Dedicated asset specificity (contract for large annual quantities)

Hypothesis: “Buyers and sellers make longer ex-ante commitment to the terms of future trade, and rely less on repeated negotiations over time, when relationship investments are more important.”

Study relationship between contract length and level of asset specificity. For example: co-location increases asset specificity and quasi-rents $\Rightarrow$ more likely to sign longer contracts
Endogeneity problems: (a) Mine-mouth is endogenous, (b) Focus on subsample of non-integrated firms, (c) Unobserved factors could influence both the decision to locate in plant mine-mouth and the length of the contract. Therefore, need to correct for endogeneity.