Protection of Intellectual Property while Outsourcing

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FOOD AND BEVERAGE COMPANIES NEED TO SHARE THEIR INTELLECTUAL PROPERTY (IP) WHEN THEY OUTSOURCE PRODUCTION AND/OR R&D TO CONTRACT AGENTS. IP SHARING CAN FACILITATE MISAPPROPRIATION AND THE CONTRACTOR MAY EVENTUALLY START COMPETING WITH THE PRINCIPAL. WE DESIGN AN INCENTIVE COMPATIBLE CONTRACT THAT CAN PROTECT THE PRINCIPAL. A TWO-STAGED STRATEGY IS PROPOSED: COMPANIES SHOULD SHARE LESS KNOW-HOW AND GIVE HIGHER INCENTIVE PAYMENTS TO DETER IP MISAPPROPRIATION. STRATEGIES LIKE PRODUCT DIFFERENTIATION MAY BE HIGHLY USEFUL TO DETER PIRACY.

OVERVIEW
• Companies are asking themselves - do we need to make “our” products ourselves?
• There are compelling economic benefits from outsourcing production and/or R&D
• However, IP protection may be a significant problem while outsourcing tasks

FB companies outsource different tasks/operations:
• Production (reasons: lack of manufacturing capacity, lower costs)
  Example: Whole Bakers developed a healthy gluten free cookie recipe but the bakery lacked large scale production capacity. Whole Bakers contracted production to Pac-Moore, a contract mixing, blending and packaging specialist.
• R&D (reasons: gain “access to technology/equipment”, lower costs)
  Information Technology
  “The outsourcing of our IT infrastructure and outsourcing management has allowed us to concentrate on our core competencies. And in a heated-up marketplace where every advantage counts, the ability to focus on what we're good at makes all the difference.” —Domino Foods Inc. CIO Don Whittington

Examples of successful outsourcing by FB companies
• Domino Foods outsources IT to Capgemi
• Kraft outsourcing certain IT operations to Capgemi
• Dean Foods outsources to Telx
• Companies work with Neraq to develop innovative R&D

Concerns with Production outsourcing
Outsourcing brings a loss of product control, dilutes or eliminates brand integrity, and opens the door to product recall

Concerns with R&D outsourcing
Firms that outsource R&D indicate that their most significant problem is loss of intellectual property. Brand identity is also difficult to maintain when there is IP loss.

RESEARCH QUESTIONS
1. In spite of the efficiencies, outsourcing is not favored by all companies. What explains this aversion to outsourcing among FB companies?
2. If a company wishes to outsource production and/or R&D, then how should it design an efficient contract that would reduce cost and protect its IP?

Model Development: Outsourcing
A company (Principal) can either do the production / R&D tasks in-house, or may outsource the tasks to an Agent through contracts.

- A R&D contract:
  \[ E^{\text{R&D contract}} = (e + k T_k) (1 - e - k T_k) \]
  and penalty for breach of contract is
  \[ \beta \]

- A D&M contract:
  \[ E^{\text{D&M contract}} = (e + k T_k) (1 - e - k T_k) - \frac{1}{2} \theta k^2 \]
  and penalty for breach of contract is
  \[ \beta \]

- Participation Constraint of Agent
  \[ \epsilon = \frac{h}{C} \text{ at } (e) = \frac{1}{2} \theta \]

- Participation Constraint of Principal
  \[ \epsilon = \frac{h}{C} \text{ with probability } \frac{1}{2} \theta \]

- Two-part tariffs and second-best contract
  \[ E^{\text{two-part tariff}} = (e + k T_k) (1 - e - k T_k) - \frac{1}{2} \theta k^2 \]
  and penalty for breach of contract is
  \[ \beta \]

Important Observations
• Expected profits depend on IP shared (k) by the Principal
• Agent’s outside option (R&D) is endogenous

First Best Solution: Profit is observable
- Maximize \([2] \) subject to \([1] \)
  \[ k^* = \frac{1}{2} \theta \]
  \[ e^{\theta} = \frac{C_A - C_I}{C_I} \]
  \[ T^* = T_k^* - \frac{1}{2} \theta k^* \]
  \[ \text{The optimal contract payment to the agent must be equal to cost of effort plus the outside option} \]

Second Best Solution: Profit is unobservable
- Maximize \([2] \) subject to \([1] \) and Incentive Compatibility Constraint:
  \[ \max_e \epsilon E^{\text{two-part tariff}} = (e + k T_k) (1 - e - k T_k) - \frac{1}{2} \theta k^2 \]

When effort is observable, the optimal contract payment should be contingent upon R&D results