A Theory of Predation Based on Agency Problems in Financial Contracting

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The Borrower-Lender Relationship

- When a bank grants a loan to a borrower, both parties typically sign a contract...
- Bolton and Scharfstein study a repeated borrower-lender relationship in which the threat of termination by the lender provides incentives for the borrower to repay the loan. This termination threat, however, is costly in a competitive environment.
Contracting Without Predation

- Consider firm B and investor I

**Period 0**
- I: take-it-or-leave-it contract
- B: accepts / refuses
Contracting Without Predation (1)

- **Period 1**

  B: 1) gross profit $\pi_1$ (with prob. $\theta$) or $\pi_2(1-\theta)$
  
  $\pi_2 > \pi_1$

  2) cost $F$

  $\pi_1 < F$

  $\bar{\pi} \equiv \theta \pi_1 + (1-\theta)\pi_2 > F$
Contracting Without Predation (2)

- **Period 1**
  1. Receives $R_i$ if manager reports profit $\pi_i$
  2. With probability $\beta_i \in [0,1]$ gives the firm $F$ to fund second-period production

- **Period 2**
  B: Reports profit
  I: Receives $R_i$
Optimal Contract (1)

\[
\max_{\{\beta_i, R_i, R_i^{'}\}} -F + \theta \left[ R_1 + \beta_1 (R^1 - F) \right] + (1 - \theta) \left[ R_2 + \beta_2 (R^2 - F) \right]
\]

subject to

(1) \( \pi_2 - R_2 + \beta_2 (\bar{\pi} - R^2) \geq \pi_2 - R_1 + \beta_1 (\bar{\pi} - R^1) \)

incentive compatibility

(2) \( \pi_i \geq R_i \)

(2') \( \pi_i - R_i + \pi_1 \geq R^i \) limited liability

(3) \( \theta \left[ \pi_1 - R_1 + \beta_1 (\bar{\pi} - R^1) \right] + (1 - \theta) \left[ \pi_2 - R_2 + \beta_2 (\bar{\pi} - R^2) \right] \geq 0 \)

individual rationality
Optimal Contract (2)

- PROPOSITION 1: The investor invests at date 0, if and only if \( F < \bar{\pi} - (\bar{\pi} - \pi_1)/(2 - \theta) \) (positive profit condition)

In this case, \( R_1^* = \pi_1 \quad R_2^* = \bar{\pi} \)
\[
\beta_1^* = 0 \quad \beta_2^* = 1
\]

the firm operates in the second period if and only if its first-period profits are \( \pi_2 \)
Predation and the Optimal Contract

- Firms A and B compete in periods 1 and 2

**Period 0**
- I: contract
- B: accepts / refuses
- A: observe the contract / cannot observe

**Period 1**
- A: preys for a cost c>0: θ -> μ / doesn’t prey
- B: \( \pi_1 \) or \( \pi_2 \)
- I: \( R_i, \beta_i \)

**Period 2**
- B: exits / remains
- A: monopolist -> \( \pi^m \) / \( \pi^d \)
- I: \( R^i \)
Observable Contracts

“no-predation constraint”:

\[(\beta_2 - \beta_1)(\mu - \theta)(\pi^m - \pi^d) \leq c \quad \text{or} \quad (\beta_2 - \beta_1) \leq \Delta\]

PROPOSITION 2: Firm B enters if and only if

\[\pi_1 - F + \max\{(1 - \theta)\Delta, 1 - \mu\}(\bar{\pi} - F) > 0\]

(positive profit condition)

If B enters, and \((1 - \theta)\Delta \geq 1 - \mu\) the optimal contract deters predation. In this case

\[\beta_1^* = 0 \quad R_1^* = \pi_1\]
\[\beta_2^* = \Delta \quad R_2^* = \Delta\bar{\pi} + (1 - \Delta)\pi_1\]

If firm B enters and \((1 - \theta)\Delta < 1 - \mu\), the contract is as given in Proposition 1 and firm A preys.
Unobservable Contracts

- When contracts are unobservable, it is as if the investor and the predator play a simultaneous move game.

- PROPOSITION 3: Firm B enters if and only if
  \[ \pi_1 - F + (1 - \mu)(\bar{\pi} - F) > 0 \]
  (positive profit condition)
  If the firm enters, the contract is as given in Proposition 1 and firm A preys.
Conclusion

The central argument of this paper is that agency problems in financial contracting can give rise to rational predation. The financial contract that minimizes agency problems also maximizes rivals’ incentives to prey.
Appendix (1)

Positive profit condition in Proposition 1: Given the optimal contract, the investor’s expected profits are:

$$
\theta (\pi_1 - F) + (1-\theta)(\bar{\pi} - F + \pi_1 - F) = \pi_1 - F + (1-\theta)(\bar{\pi} - F) > 0
$$

Thus

$$
F < \bar{\pi} - (\bar{\pi} - \pi_1)/(2-\theta)
$$
Appendix (2)

- Proposition 1: there is an ex post inefficiency; the firm is liquidated when first-period profit is \( \pi_1 \) even though \( \bar{\pi} > F \) and it is efficient to operate.
- Predation can induce liquidation and exit because it adversely affects the agency relationship between the rival’s investors and manager. This may force the firm to rely more on internal sources of capital than on external ones. But, this reduces the extent to which outside investors monitor the firm and increases the possibility of managerial slack.