

Buying to Sell: A Theory of Private Equity

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Agenda

- Introduction
- Model
- Extensions and robustness
- Takeaways

Introduction

Private equity funds

- Important owners of assets
- Buy with the intent of selling
 - 10-14 year funds
 - Median holding period 6 years
 - Trade sale most common (38%, KS09)

Exit is important

- How can you tell when a private equity dealmaker walks into the room?

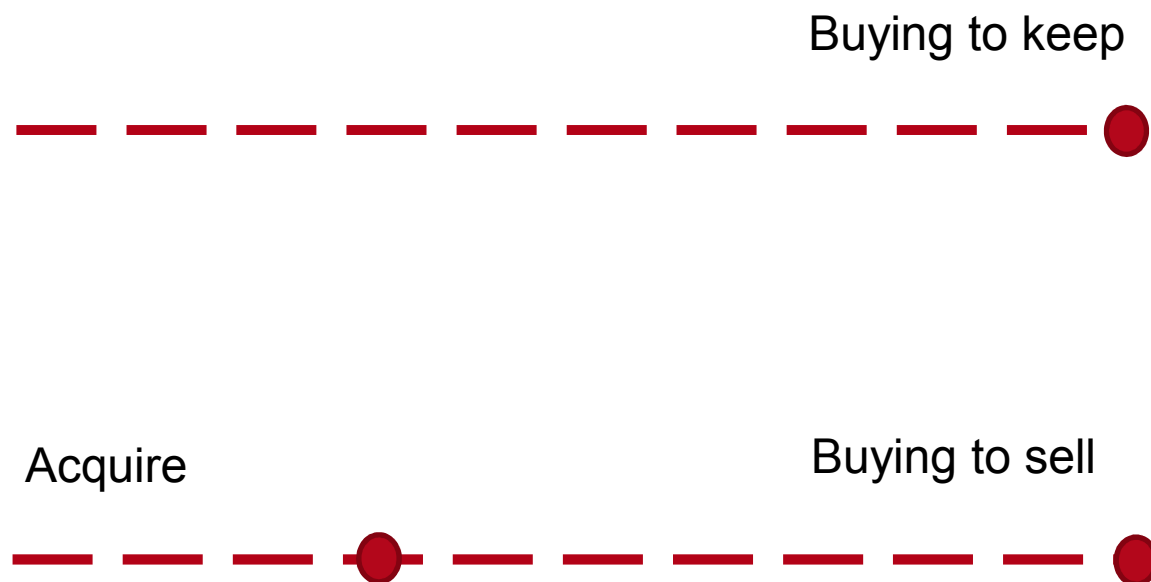
Exit is important

- How can you tell when a private equity dealmaker walks into the room?
- He will start looking for the best exit almost immediately.

Exit is important

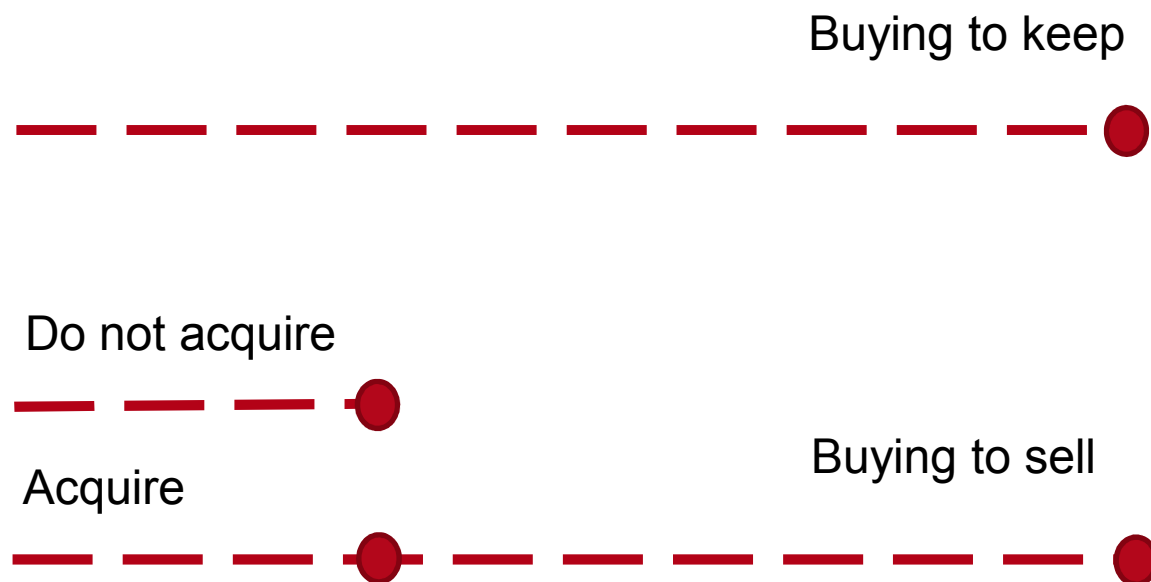
- Can buying to sell have real effects on target firms?
- Intuition: buying to sell should not matter

Intuition: B2S does not matter



Our Contribution

Buying to sell matters



Buying to sell matters

- Stronger incentives to restructure firms
 - Managerial ownership higher
 - Leverage higher
 - Productivity higher
 - Outbidding incumbents can be hard
- Requires
 - Buying to sell
 - Trade sale considered
 - Two firms from same industry bid

Related literature

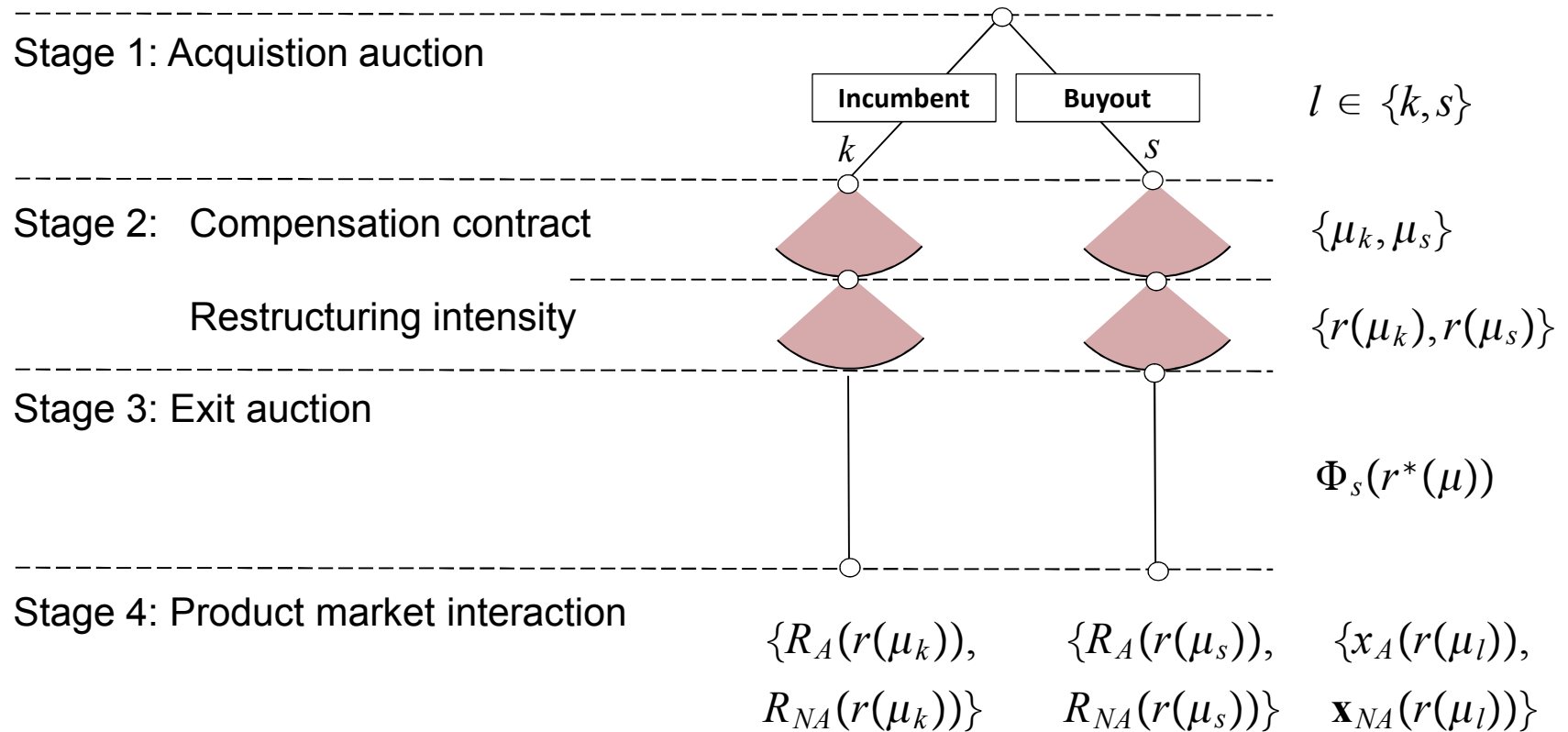
- Agency view on LBOs
 - Jensen 1986, 1989
- Auctions in finance
 - Dasgupta and Hansen 2007
 - Jehiel and Moldovanu 1999
- Product markets/Financial markets
 - Brander and Lewis 1986, 1988; Maksimovic, 1988; Bolton and Scharfstein, 1990; Phillips, 1995

The Model

Setup

- Oligopolistic product market
- Competitive acquisition/exit auction
- PE buy to sell
- Trade sale only (IPO later)
- Governance, financial and operational engineering

Structure and Timing



Stage 4: Product Market Competition

- Firms maximize: $\Pi_i(x_i, \mathbf{x}_{-i}, r, z)$
- Nash-Equilibrium : $\frac{\partial \Pi_i}{\partial x_i}(x_i^*, \mathbf{x}_{-i}^*; r, z) = 0$
- Reduced form profits:

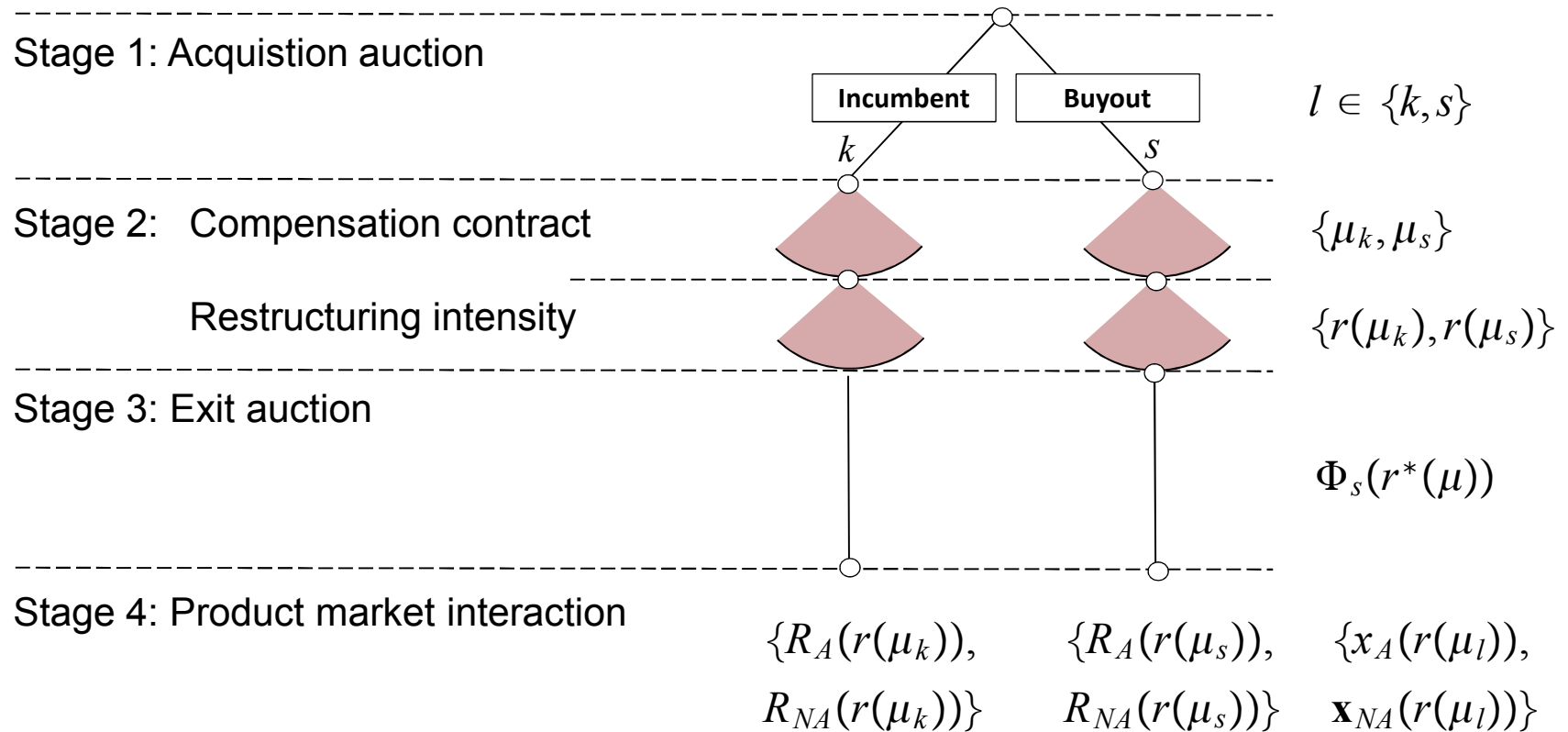
$$R_A(r) \equiv \Pi_A(x_A^*(r), \underbrace{x_{NA}^*(r), \dots, x_{NA}^*(r)}_{n-1}, r), \text{ and}$$

$$R_{NA}(r) \equiv \Pi_{NA}(x_{NA}^*(r), \underbrace{x_{NA}^*(r), \dots, x_{NA}^*(r)}_{n-2}, x_A^*(r), r).$$

Restructuring improves productivity

$$\frac{dR_A(r)}{dr} > 0 \text{ and } \frac{dR_{NA}(r)}{dr} < 0$$

Structure and Timing

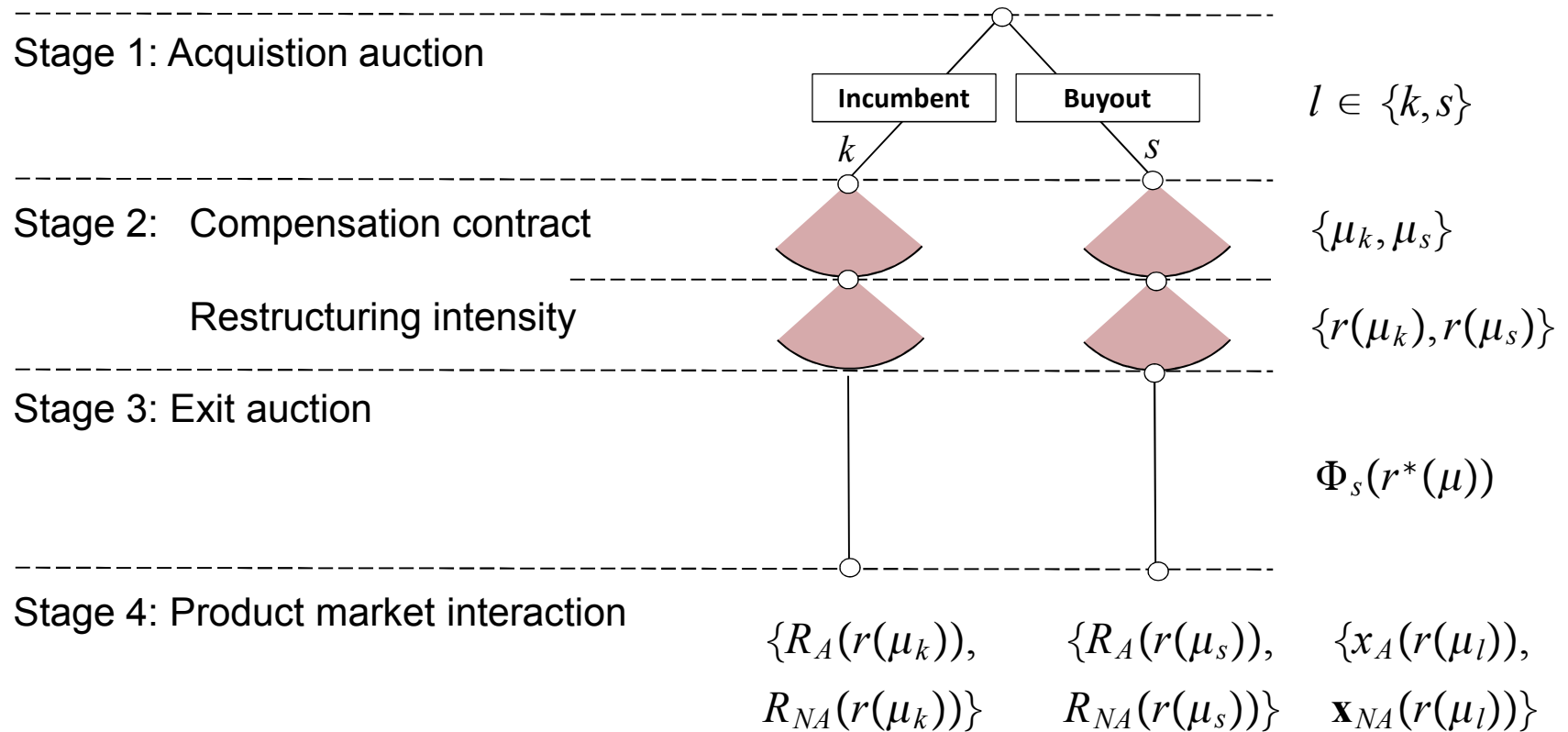


Stage 3: Exit (Trade Sale)

- First price perfect information auction
- Incumbent valuation: $\Phi_s(r) = R_A(r) - R_{NA}(r)$

Lemma 1: Sales price is $\Phi_s^*(r) = R_A(r) - R_{NA}(r)$

Structure and Timing



Stage 2: Compensation contract

- CARA preferences: $u(w, r) = -e^{-\eta[w(b, \mu) - C(r)]}$

- Linear contract: $w(b, \mu) = b + \mu[R_A(r) - F + \varepsilon]$

- Maximization

$$r^* = \arg \max_r E[u(w, r)] = \arg \max_r [b + \mu[R_A(r) - F] - C(r) - \Omega(\mu)]$$

$$\Rightarrow \mu \frac{dR_A}{dr} = C'(r^*) \quad \frac{dr^*}{d\mu} = -\frac{R'_{A,r}}{\mu R''_{A,rr} - C''} > 0$$

Stage 2: Managerial Ownership

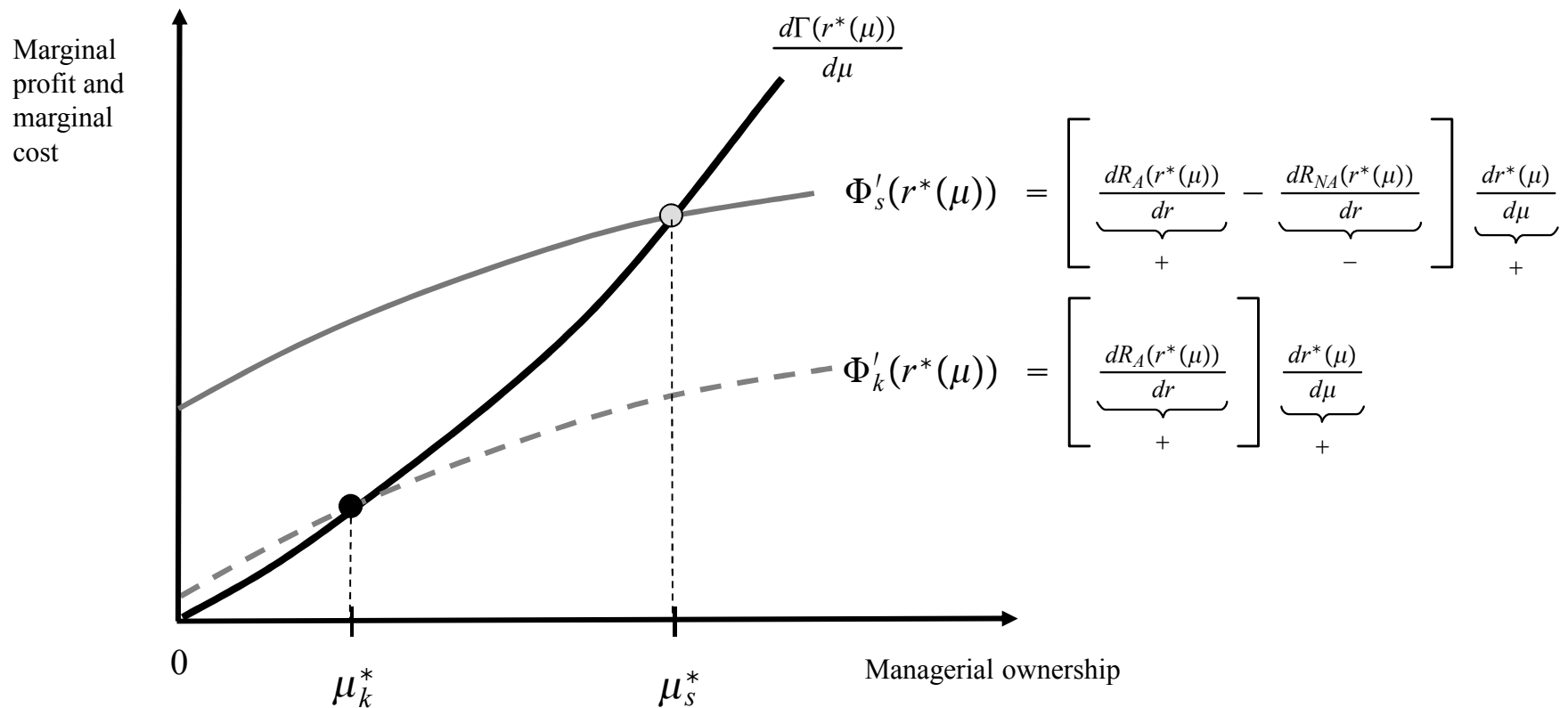
- Participation:

$$w(b, \mu) - C(r^*(\mu)) - \Omega(\mu) = \bar{w}$$

- Costs:

$$\Gamma_l(r^*(\mu)) = \Gamma(r^*(\mu)) = F + \bar{w} + C(r^*(\mu)) + \Omega(\mu)$$

Stage 2: Managerial Ownership



Proposition 1:

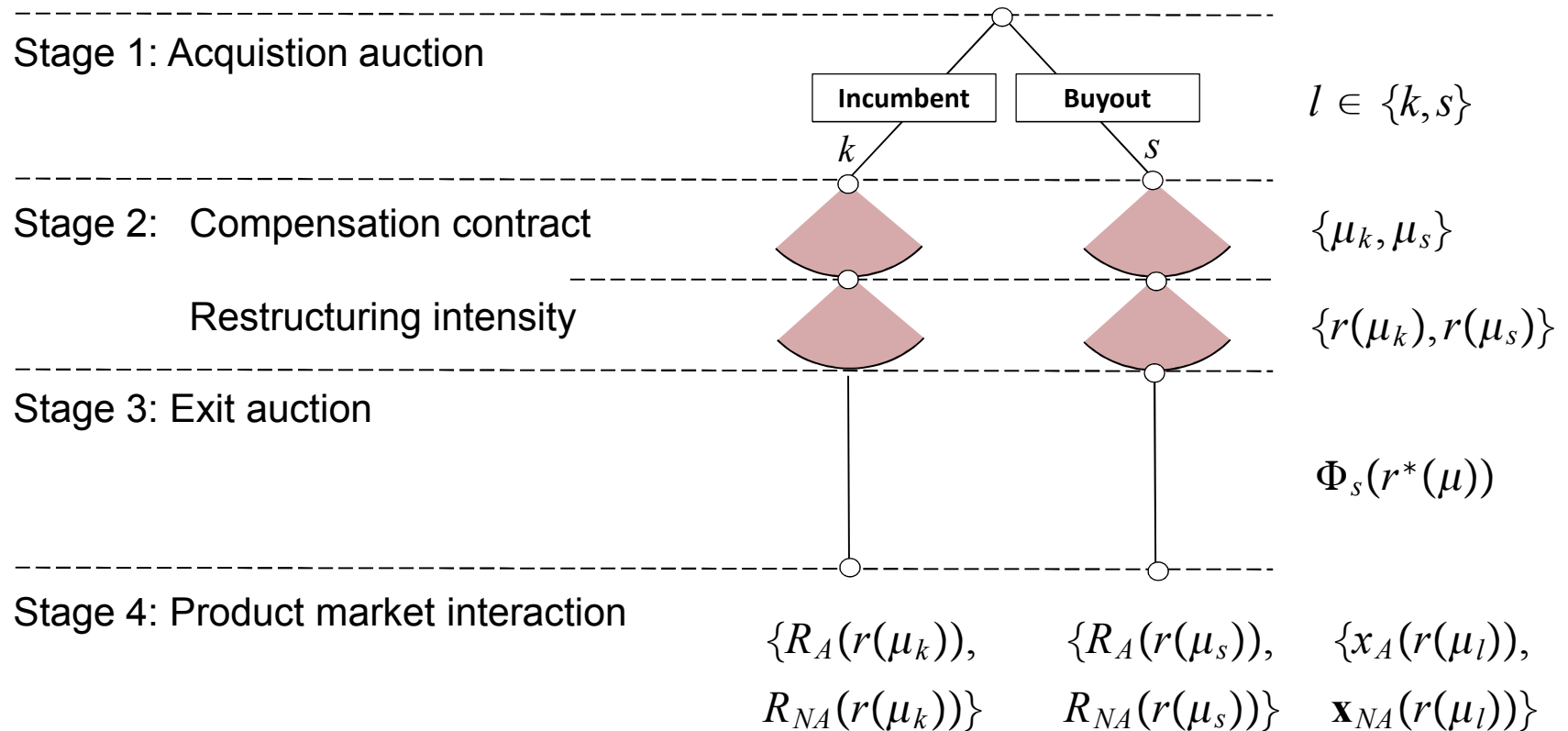
- Buying to sell leads to:
 - Stronger incentive contracts:

$$\mu_s^* > \mu_k^*$$

- More restructuring/higher productivity:

$$r^*(\mu_s^*) > r^*(\mu_k^*)$$

Structure and Timing



Stage 1: Equilibrium Ownership

- Valuations

- Buyout

$$v_s(\mu_s^*) = \Phi_s^*(r^*(\mu_s^*)) - \Gamma(r^*(\mu_s^*))$$

- Incumbent

$$v_{kk}(\mu_k^*) = R_A(r^*(\mu_k^*)) - \Gamma(r^*(\mu_k^*)) - R_{NA}(r^*(\mu_k^*))$$

$$v_{ks}(\mu_k^*, \mu_s^*) = R_A(r^*(\mu_k^*)) - \Gamma(r^*(\mu_k^*)) - R_{NA}(r^*(\mu_s^*))$$

- Rankings:

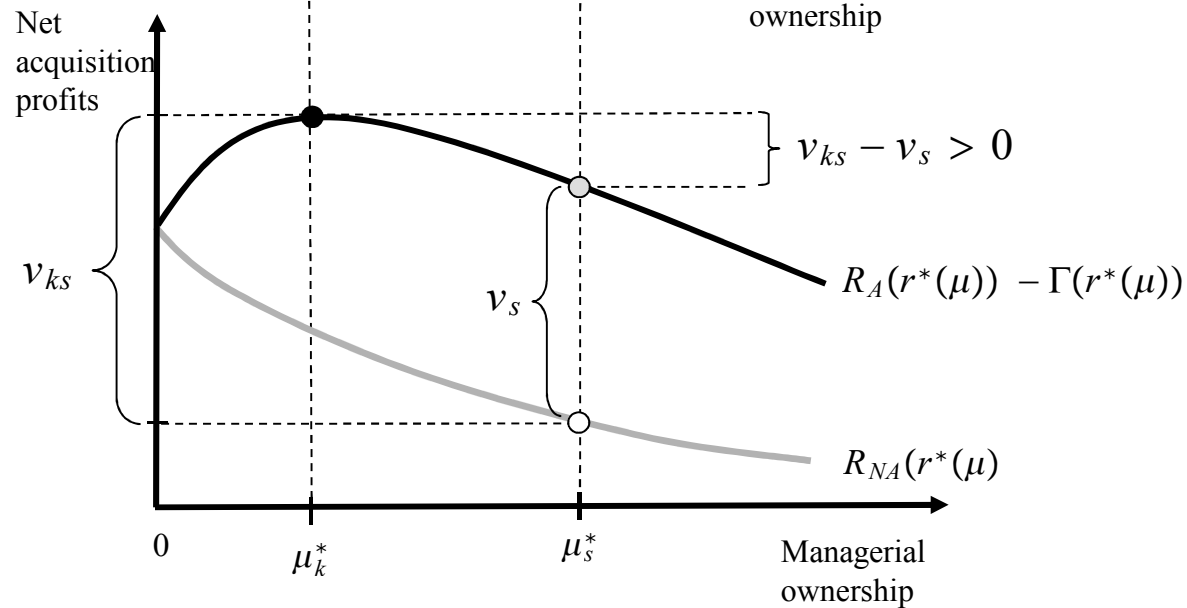
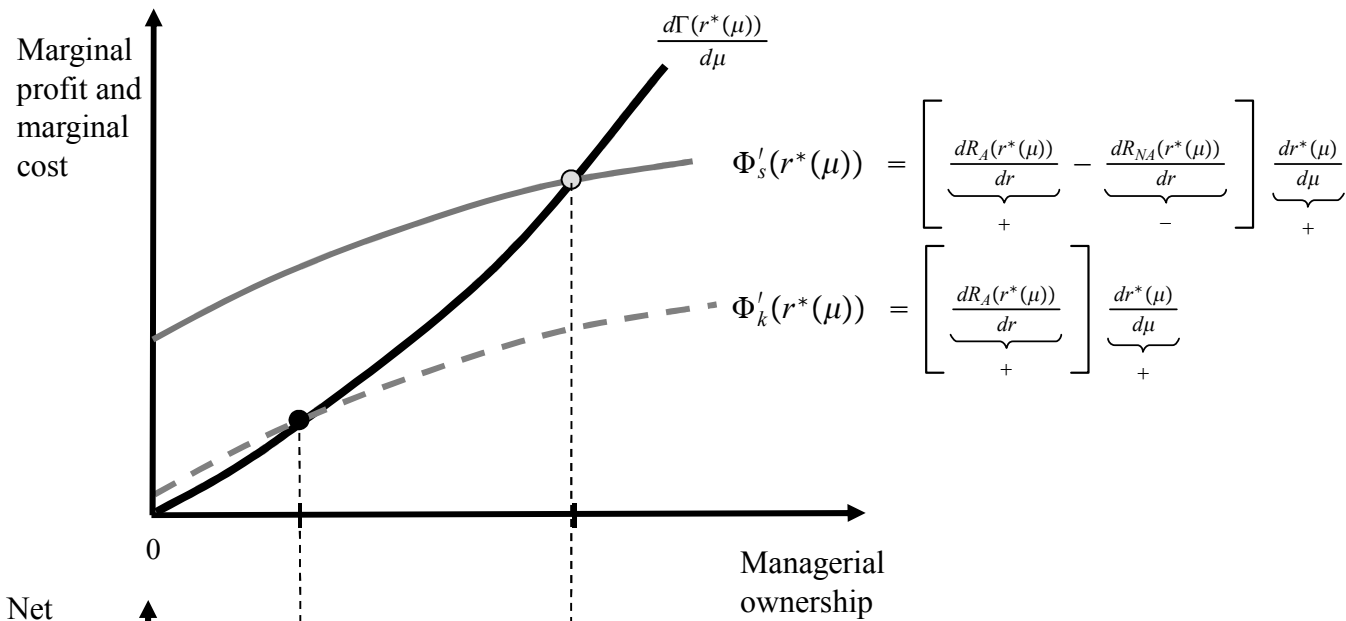
$$v_{ks} > v_{kk}$$

$$v_s > v_{kk}$$



$$v_s > v_{ks} > v_{kk}$$

$$\text{or } v_{ks} > v_s > v_{kk}$$



$$v_{ks} = R_A(r^*(\mu_k^*)) - \Gamma(r^*(\mu_k^*)) - R_{NA}(r^*(\mu_s^*))$$

$$v_s = R_A(r^*(\mu_s^*)) - R_{NA}(r^*(\mu_s^*)) - \Gamma(r^*(\mu_s^*))$$

Propositions 2:

Outbidding incumbents can be hard

$$\begin{aligned}v_s - v_{ks} &= \Phi_s^*(r^*(\mu_s^*)) - \Gamma(r^*(\mu_s^*)) - [R_A(r^*(\mu_k^*)) - \Gamma(r^*(\mu_k^*)) - R_{NA}(r^*(\mu_s^*))] \\ &= [R_A(r^*(\mu_s^*)) - \Gamma(r^*(\mu_s^*))] - [R_A(r^*(\mu_k^*)) - \Gamma(r^*(\mu_k^*))].\end{aligned}$$

Since $\mu_s^* > \mu_k^*$, $v_s - v_{ks} < 0$ always hold

- Buyouts in equilibrium
 - Better at due diligence
 - Tax shields, access to cheaper capital, ect...
 - Coordination failure among incumbents

Extensions and robustness

Extensions and robustness

- Incumbents that buy to sell
- Incentive contract on trade sale price
- Leverage to incentivize managers
- IPOs versus trade-sales

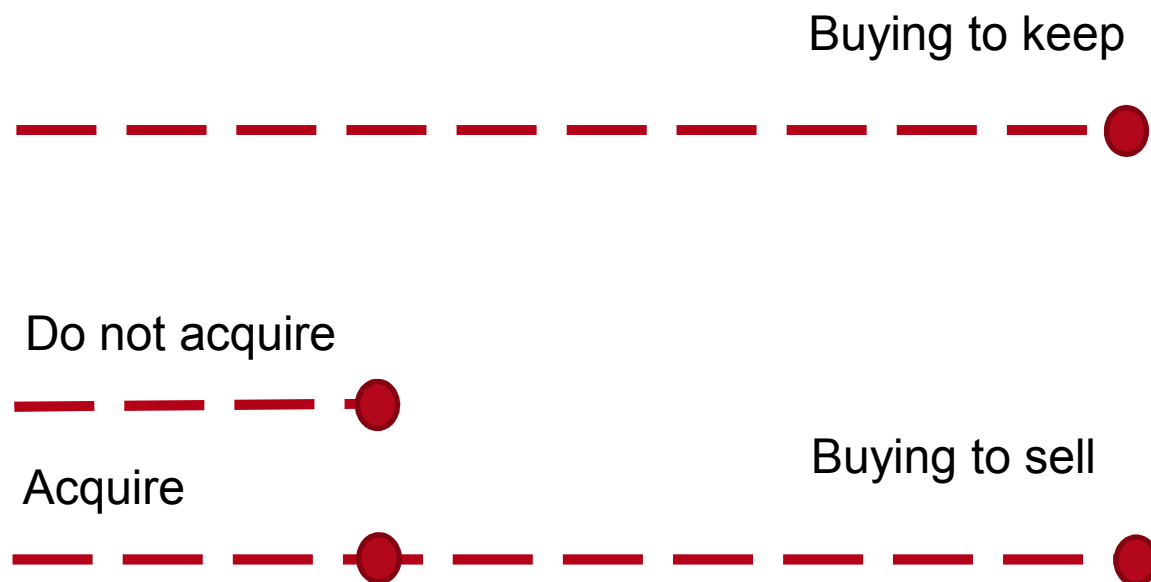
Empirical Predictions

Empirical Implications

- PE backed firms
 - Higher managerial ownership
 - More productive
 - Higher leverage
- Effects are stronger
 - Industry concentration up = stronger effects
 - Trade sale = stronger effects

Takeaways

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Implications

- Theory:
 - Endogenous ownership of assets
 - Auction-investment-auction model
- Empirics:
 - Product market aspects=>managerial ownership, leverage, productivity, sales price, acquisition price, choice of exit mode...
- Policy:
 - buyouts make firms more efficient
 - complement more permanent owners

Thank you for your attention!