Common Ownership, Bidder Termination Provisions and Self-Selection in the Market for Mergers & Acquisitions

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Introduction

Why Study Common Ownership and BTPs?

- Open question of whether common ownership diverts firms' incentives away from value maximization has high relevance for welfare, policy making and also academic research.
- Previous results from empirical literature on common ownership and product markets remain indeterminate, causing inactivity of both regulators and researchers.
- Market for merger transactions comprises a more promising field: Mergers are typically top management decisions and acting firms clearly identified.
- However, final deal outcomes critically depend on contractual agreements, which have not yet been related to common ownership.
- This paper: First paper to investigate common ownership and bidder termination provisions (BTPs).
- A BTP is a transaction provision that requires the bidder to pay a fixed fee if the deal is not consummated for reasons that lie in her responsibility.
- BTPs make up 4.7% of deal volume on average and their inclusion rates have been steadily increasing, from 6.2% of deals in 1985 to 27.8% in 2018.
- Largest BTP recorded to date amounted to 15% of deal value in 2022.

Common Ownership and BTPs over Time

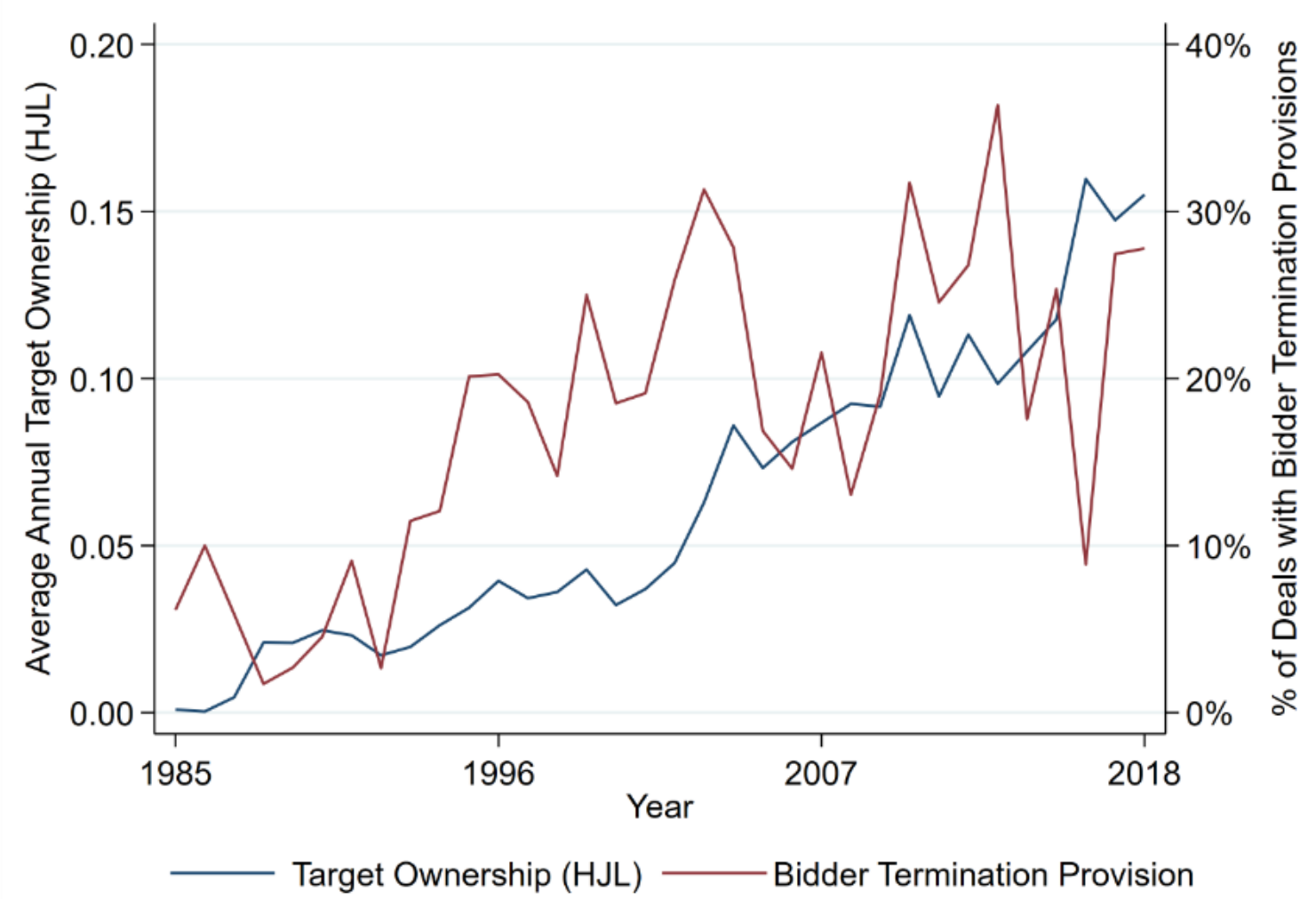

Figure 1: *Bidder termination provision (BTP) inclusion and common ownership over time.*

Contribution

- First, we present a stylized model of optimal contracting in takeover deals under common ownership.
  - Privately informed bidder may offer a contract with or without bidder termination provision (BTP) to acquire target's asset as in Chen et al. (2022), or walk away from the opportunity to make a bid and self-select from the sample.
  - We incorporate partial internalization of common shareholders portfolio interests as in Rotemberg (1984) to demonstrate: Common ownership shifts the lower bound for acceptable deals to the left, i.e. facilitates lower synergy deals.
  - We prove that this shift in acceptable deals has a one-to-one correspondence with an increasing share of deals incorporating BTP $\rightarrow$ testable prediction.
- Second, we provide empirical evidence that is broadly consistent with the predictions of our theory.
  - Sample of 3,115 unique mergers of U.S. publicly listed firms.
  - Panel regressions suggest common ownership has large positive effect on probability of BTP inclusion.
  - Moreover, with increasing common ownership, these BTPs are larger, deal premiums are lower and the completion rate of bad deals declines.
  - We demonstrate robustness of our results against several confounding factors identified in the literature.

Literature

- Common ownership and corporate strategic decisions
  - Antón et al. (2022) extend the work of Matvos and Ostrovsky (2008) to non-merging industry rivals and provide a rational why acquirer shareholders fail to stand up against value destroying mergers.
  - Brooks et al. (2018) related common ownership to the subsequent probability of a merger among cross-held firms and several other characteristics such as deal premiums and completion probabilities.
- Contractual clauses and their effects on mergers
  - Bates and Lemmon (2003) are the first to study BTP inclusion and their association with merger outcomes; Coates et al. (2018) find similar results for inefficiently designed BTPs.
  - Chen et al., 2022 develop a theory of optimal contracting that rationalizes BTP inclusion under uncertainty about target's value under bidder's control and find strong empirical support.

Model

Setting

- Three stage optimal contracting game among two players: Bidder and target.
- Bidder has private information about the value of target's assets under her control.
- Bidder chooses optimal offer based on private information and target's participation constraint.
- Payoffs are realized after the deal, deal parameters becomes public knowledge.
- Solution via Bayesian Nash equilibrium, bidder's optimal offer is driven by the degree of common ownership internalization.

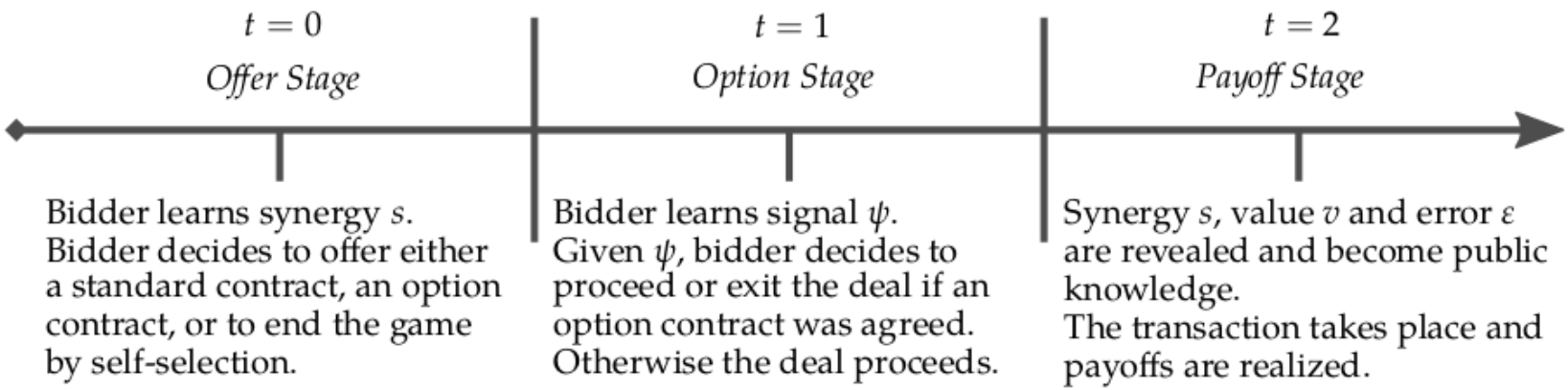

Figure 2: *Timeline of the model.*

- Players
  - All equity financed with a single share outstanding, ex ante market value of target (bidder) equal to 1 ($w > 0$).
  - Target acts in the best interest of shareholders, asks full expected surplus to participate in the transaction, gives up option to terminate the deal.
  - Bidder internalizes portfolio interests of shareholders in target, captured by parameter λ (< 1).
  - Bidder has deep pockets to finance offer $b \geq 0$, no competing offers.
- Information
  - Value of target's asset at the end of the game depends on who controls it with

$$V_{\text{Bidder}} = s + v + \varepsilon, \qquad \text{or} \qquad V_{\text{Target}} = 1 + v. \tag{1}$$

  - Random variables correspond to value (v), synergy (s) and error (ε).
  - Bidder knows the value of synergy s from $t = 0$.
  - At $t = 1$, bidder learns signal $\psi \in \{+1, -1\}$ each with probability $\pi = 1/2$, may trigger deal termination if option contract was negotiated.
  - Distributions of random variables obey $\mathbb{E}[v] = \overline{v} < 1$ with $v \in [0, +\infty)$, $\mathbb{E}[s] = \overline{s} > 1$ with $v \in (-\infty, +\infty)$ and $\mathbb{E}[\varepsilon] = 0$ with $\varepsilon \in (-\infty, +\infty)$. Moreover,

$$\mathbb{E}_{t=1}[\varepsilon | \psi\varepsilon \geq 0] = \begin{cases} +\overline{\varepsilon} & \text{if } \psi = +1, \\ -\overline{\varepsilon} & \text{otherwise,} \end{cases} \tag{2}$$

  with the additional technical assumption that $|\overline{\varepsilon}| > \overline{s} - 1$.

- Moves
  - At $t = 0$, bidder is born knowing s, target only knows $\overline{s}$.
  - Ex ante value of target's asset depending on who controls it given by

$$\mathbb{E}[V_{\text{Bidder}}] = \overline{s} + \overline{v}, \qquad \text{or} \qquad \mathbb{E}[V_{\text{Target}}] = 1 + \overline{v}. \tag{3}$$

  - Target knows expected values and demands $b \geq b^{\dagger} = \overline{s} + \overline{v}$ to participate.
  - Bidder may choose among two types of stylized contracts:
  - Standard contract – Acts as commitment device for both players, no termination under any circumstance.
  - Option contract – Bidder retains the option to walk away at $t = 1$, s.t. a penalty payment p, creating an option value for bidder.
  - Target understands bidder's lack of commitment in the latter case and additionally demands

$$p + 1 + \overline{v} \geq b^{\dagger} = \overline{s} + \overline{v} \quad \Longrightarrow \quad p \geq p^{\dagger} = \overline{s} - 1. \tag{4}$$

  - No shared gains as in Chen et al. (2022), target is fully hedged against adverse outcomes.

- Payoffs
  - Payoffs and cash transfers realized at $t = 2$, without discounting.
  - For target participation strictly dominates non-participation upon receiving an offer.
  - For bidder depends on private information about synergy s and common ownership parameter λ.

Equilibrium Intuition

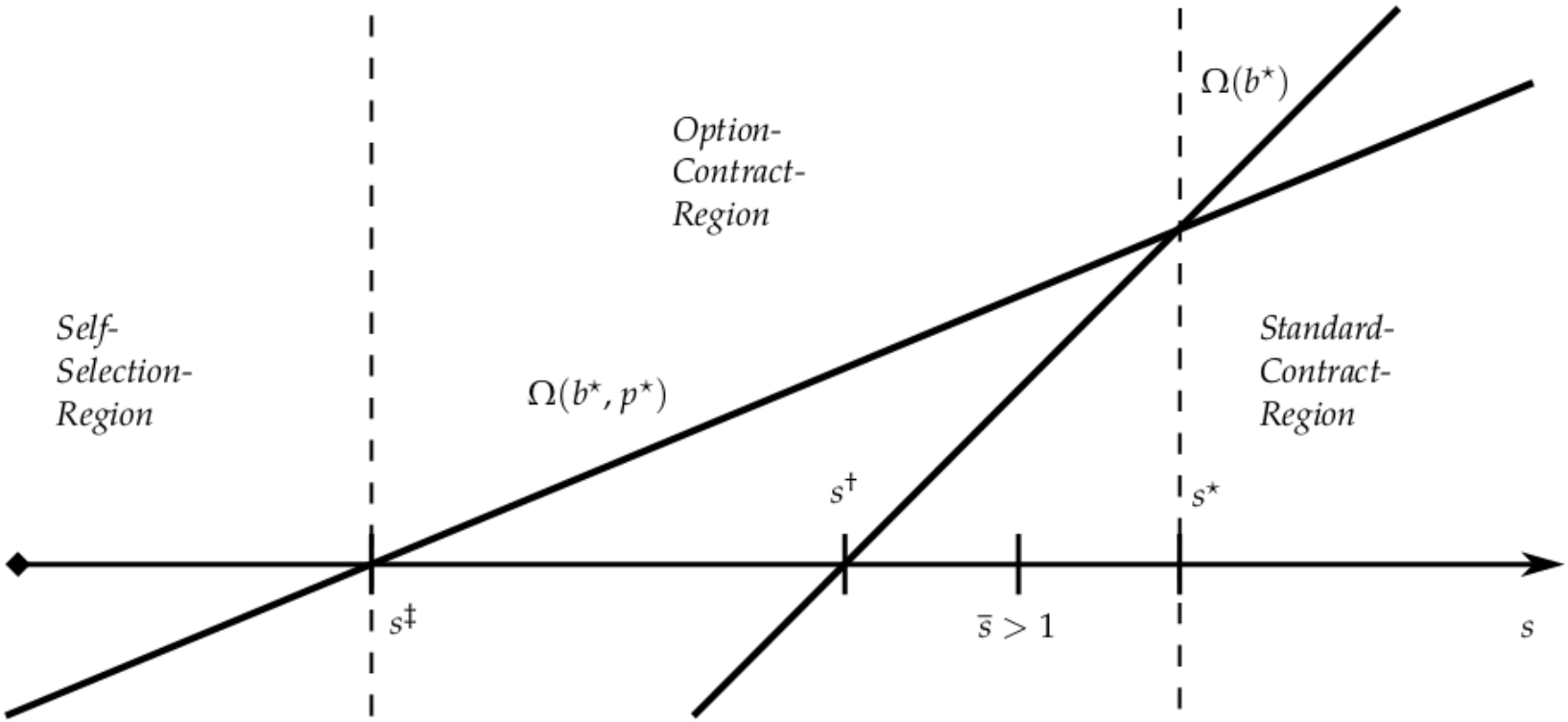

Figure 3: *Ex ante expected value of bidder's contract options with optimal offers and switching and self-selection thresholds.*

Deals with Standard Contracts

- Ownership internalization – Given a synergy s, the ex ante value of bidder's objective function at $t = 0$ is given by

$$\Omega(b) = \mathbb{E}[G_b(b)] + \lambda\mathbb{E}[G_t(b)] = s + \overline{v} - b + \lambda b. \tag{5}$$

- Optimal offer – Linearity in b implies $b^\star = b^\dagger$ and

$$\Omega(b^\star) = s - (1-\lambda)\overline{s} + \lambda\overline{v}, \tag{6}$$

  which increases in synergy s (with slope 1) but decreases in expected synergy $\overline{s}$.
- Self-selection – Bidder refrains from making an offer using a standard contract when

$$\Omega(b^\star) = s - (1-\lambda)\overline{s} + \lambda\overline{v} \leq 0 \quad \Leftrightarrow \quad s \leq s^\dagger = (1-\lambda)\overline{s} - \lambda\overline{v}. \tag{7}$$

- Slope of self-selection threshold w.r.t. common ownership obeys

$$\frac{\partial s^\dagger}{\partial \lambda} = -(\overline{s} + \overline{v}) = -b^\dagger < 0. \tag{8}$$

That is higher internalization of common owners' portfolio interests lowers the bar for an acceptable deal in terms of synergy s.

Deals with Option Contracts

- Option exercise – Conjecture and verify that bidder uses option contract whenever termination in the *bad state*, $\psi = -1$, is optimal.
- Ownership internalization – Given a synergy s, the ex ante value of bidder's objective function at $t = 0$ is given by

$$\Omega(b, p) = (-(1-\lambda)p + (1+\overline{v})\lambda) \times \frac{1}{2} + (s + \overline{\varepsilon} + \overline{v} - (1-\lambda)b) \times \frac{1}{2}. \quad (9)$$

- Optimal offer – Linearity in b and p imply $b^\star = b^\dagger$ and $p^\star = p^\dagger$ such that

$$\Omega(b^\star, p^\star) = \frac{s + \overline{\varepsilon} + 1}{2} - (1-\lambda)\overline{s} + \lambda\overline{v}. \quad (10)$$

  which increases in synergy s (with slope $1/2$) but decreases in expected synergy $\overline{s}$.
- Self-selection – Bidder refrains from making an offer using an option contract when

$$s \leq s^\ddagger = 2\left((1-\lambda)\overline{s} - \lambda\overline{v}\right) - 1 - \overline{\varepsilon} = 2\,s^\dagger - 1 - \overline{\varepsilon}, \quad \text{with} \quad \frac{\partial s^\ddagger}{\partial \lambda} = -2b^\dagger < 0. \quad (11)$$

- Switching threshold – Linearity of optimal contracts' expected payoff in synergy s implies unique intersection among contract types given by

$$s^\star - (1-\lambda)\overline{s} + \lambda\overline{v} = \frac{s^\star + \overline{\varepsilon} + 1}{2} - (1-\lambda)\overline{s} + \lambda\overline{v} \quad \Leftrightarrow \quad s^\star = 1 + \overline{\varepsilon}. \quad (12)$$

Common Ownership, Contract Choice and Bidder Self-Selection

- Three regions – If the self-selection threshold for option contracts, $s^{\ddagger}$, lies below the self-selection threshold for standard contracts, $s^{\dagger}$, optimal contracting admits three distinct regions (Figure 3). This is true whenever

$$s^{\ddagger} \leq s^{\dagger} \quad \Leftrightarrow \quad 2\,s^{\dagger} - 1 - \overline{\varepsilon} \leq s^{\dagger} \quad \Leftrightarrow \quad s^{\dagger} = (1-\lambda)\overline{s} - \lambda\overline{v} \leq \overline{s} < 1 + \overline{\varepsilon} = s^{\star}. \tag{13}$$

- Probability of BTP inclusion – Conditional on the above, we observe bidder termination provisions with probability

$$\mathbb{P}^{\star} = 1 - \frac{1 - F_s(s^{\star})}{1 - F_s(s^{\ddagger})}, \quad \text{where} \quad \frac{\partial \mathbb{P}^{\star}}{\partial \lambda} = -\frac{\partial s^{\ddagger}}{\partial \lambda} \frac{(1 - F_s(s^{\star}))f_s(s^{\ddagger})}{(1 - F_s(s^{\ddagger}))^2} > 0. \tag{14}$$

Hypothesis

In a sample of observed takeover deals, the regression coefficient of bidder termination fee inclusion on a suitable measure of common ownership, denoted $\widehat{\beta}$, is positive and statistically significant. The econometric test of this hypothesis demands rejection of

$$\mathcal{H}_0 : \widehat{\beta} \leq 0. \tag{15}$$

Sample

Sample

- Data on merger agreements comes from Thomson Reuters SDC Platinum and is prepared following Dimopoulos and Sacchetto (2014),
  - Only consider bids with final outcome recorded as *"completed"* or *"withdrawn"*,
  - Bidder owns less than 50% before announcement and seeks to own at least 90% in target,
  - Both, bidder and target have to be publicly listed and headquartered in the U.S.,
  - Limit attention to first offer in contested deals.
  - First merger with BTP in 1985 $\rightarrow$ merger sample spans period from 1985 to 2018.
- Institutional ownership records based on SEC form 13F filings comes from Thomson Reuters *"s34"* database and Backus et al. (2021),
  - Mandatory filing for all institutional investors with AUM $\geq$ \$100 million,
  - Stale reporting in Thomson Reuters in the 2010s (Ben-David et al. (2021)) $\rightarrow$ use Backus et al. (2021) from 2010 to 2016 and Thomson Reuters otherwise.
- Augment sample with additional control variables based on
  - Bidder and target financial data from S&P Compustat,
  - Data on stock prices and shares outstanding from CRSP.

Measuring Common Ownership

- We follow Antón et al. (2022) and employ a generalized measure of Harford et al. (2011) given by

$$\text{Target Ownership (HJL)} = \sum_{i=1}^{I} \frac{\beta_{a,i}\beta_{t,i}}{\beta_{a,i} + \beta_{t,i}}. \tag{16}$$

  where $\beta_{t,i}$ ($\beta_{a,i}$) are the holdings of investor i in the target (acquirer) firm.
- Improves on the non-weighted measure of Matvos and Ostrovsky (2008) and avoids arbitrary cutoffs as in Harford et al. (2011).

				Including BTP		**Excluding BTP**	
	Mean	Median	Std. Dev.	Mean	Median	Mean	Median
Target Ownership (HJL)	0.053	0.022	0.067	0.084	0.065	0.046***	0.017***
# of Common Blockh.	0.211	0.000	0.562	0.395	0.000	0.171***	0.000***
Bidder Term. Provision	0.18	0.00	0.38	1.00	1.00	0.00	0.00
Target Term. Provision	0.61	1.00	0.49	0.95	1.00	0.53***	1.00
Premium	0.64	0.48	0.57	0.58	0.42	0.65***	0.49***

Table 1: Selected variables from the summary statistics in reported Table 2, Panels A and B.

Empirical Analysis

Empirical Analysis

- We employ a set of panel regressions to test Hypothesis 1, as well as gauge the direct effects of common ownership on merger outcomes as well as indirect effects through BTP.
- To this end, we define two sets of regression specifications with linear predictors given by

$$\text{BTP}_{itz} = \beta \times CO_i + \phi \times X_i + \eta_t + \mu_z + \varepsilon_{itz} \tag{17}$$

and

$$\text{Outcome}_{itz} = \beta \times CO_i + \psi \times BTP_i + \phi \times X_i + \eta_t + \mu_z + \varepsilon_{itz} \tag{18}$$

where i denotes the merger event index, t denotes calendar years and z is an index on targets' Fama-French-10-industry classification.
- Above, BTP denotes a dummy for inclusion of bidder termination provisions, *Outcome* is a placeholder for other merger outcomes, CO_i is a measure of common ownership, X_i is vector deal- , bidder- and target firm controls, η_t (μ_z) represents time (industry) fixed effects and ε_{itz} captures the residual error.

Common Ownership and BTP Inclusion

Dependent Variable	**Bidder Termination Provision**		
	(1)	(2)	(3)
Target Ownership (HJL)	4.4712***	7.0223***	3.8488**
	(0.923)	(1.250)	(1.647)
Target Termination Provision	3.1571***	3.1499***	3.1445***
	(0.292)	(0.290)	(0.288)
Obs.	3,115	3,114	3,027
Deal Controls	Yes	Yes	Yes
Acquirer Controls	No	Yes	Yes
Target Controls	No	No	Yes
Year FEs	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes
Pseudo R-squared	0.2830	0.2959	0.3066

Table 2: *Logistic regression modeling the effect of common ownership on the inclusion of bidder termination provisions in merger transactions. Robust standard errors in parentheses. The significance levels are denoted by: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.10$.*

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Robustness and Economic Significance

Results on the positive association of the inclusion of bidder termination provisions (BTP) and common ownership are robust to

- Alternative measures of common ownership (Antón et al. (2022), Matvos and Ostrovsky (2008))
- Data reporting issues before 1997 (Boone and Mulherin (2007), Jeon and Ligon (2011), Coates et al. (2018))
- Using target termination provision (TTP) as precondition (Chen et al. (2022), Afsharipour (2010), Quinn (2010))
- Presence of potential termination triggers (Chen et al. (2022))

Economic Significance: Probability of BTP Inclusion

	(1)	(2)	(3)
Predict at Variable Means	0.0835	0.0805	0.0788
Predict Including Standard Deviation Increase in CO	0.1095	0.1229	0.0997
Prediction Change in %	31.16%	52.79%	26.53%

Table 3: *Economic effect of a one std. dev. increase in common ownership on the probability of BTP inclusion at variable means using the coefficients estimated above.*

Common Ownership and Premiums

Dependent Variable	**Premium**		
	(1)	(2)	(3)
Target Ownership (HJL)	-0.7748***	-1.4185***	-0.3765
	(0.155)	(0.205)	(0.272)
Bidder Termination Provision	-0.0826***	-0.0838***	-0.0577**
	(0.026)	(0.025)	(0.024)
Target Termination Provision	0.0161	0.0032	0.0193
	(0.025)	(0.025)	(0.024)
Obs.	3,115	3,114	3,027
Deal controls	Yes	Yes	Yes
Acquirer controls	No	Yes	Yes
Target controls	No	No	Yes
Year FEs	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes
R-squared	0.1589	0.1739	0.2533

Table 4: *OLS regression modeling the offer premium in merger transactions. Robust standard errors in parentheses. The significance levels are denoted by: *** $p < 0.01$, ** $p < 0.05$ and * $p < 0.10$.*

Conclusion

Conclusion

- The rise of institutional ownership beginning in the 1980s was a major success, allowing investors to diversify their portfolios at low cost.
- However, conflicts of interest may emerge among diversified and non-diversified shareholders when portfolio firms interact strategically.
- This paper: Use mergers and acquisitions which are directed close to top management as testing ground for internalization of portfolio interests.
- We present a stylized model of optimal contracting among a bidder and a target firm and find, that increasing common ownership shifts the lower bound for acceptable deals to the left, i.e. towards ex ante less desirable or even value destroying deals for non-diversified shareholders.
- Ceteris paribus, this is accompanied by an increasing share of takeover contracts including bidder termination provisions (BTP) providing a testable hypothesis with strong economic intuition.
- We report a strong positive and statistically significant association of our measures of common ownership with the likelihood of BTP inclusion in a merger agreement.
- Our empirical evidence is robust to using alternative measures, accounting for irregularities in the data and inclusion of potential termination triggers documented in Chen et al. (2022).

Working paper available at
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4722631