

Intellectual Property Protection in M&A Negotiations

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Motivation:

- Up to now, there exists no direct protection mechanism for target's intellectual property (IP) during M&A negotiations, and non-disclosure agreements (NDAs) do not fulfill a compensating role if the deal is terminated
- Research Question 1: How can target's IP be protected during an M&A deal?**
- Possible Answer:** Create economic incentives for the acquirer to close the deal and/or consider a compensation payment to the target for revealing secret information to the acquirer in case the deal is terminated
- Main idea:** Target firm's valuable IP can be protected from expropriation by the acquirer through negotiating a compensating **bidder termination fee (BTF)**, which is paid by the acquirer to the target in case the former abandons the deal due to reasons under his sphere of control
- Related literature focuses on the **inclusion** (i.e., determinants of use) of termination fees in M&A contracts (e.g., most recently Chen et al. (2020)), but not on the **indirect cost component and pricing of the BTF**
- Research Question 2: How high is this compensation payment as a share of the total amount of the negotiated BTF?**
- Central Hypothesis: The higher the value of target firm's IP, as proxied by its knowledge capital stock, the higher the negotiated BTF**

Contribution:

- Identification of an important determinant of **indirect costs of deal termination** for the target firm as well as the pricing of the BTF
- Creation of a **proxy for target's IP value** by applying Ewens et al. (2020) capitalization model for intangible capital stocks (accumulated and depreciated R&D and SG&A expenses over the last 10 years prior to deal announcement)
- Instrument variables approach** for the main variable of interest (target firm's knowledge capital stock) to exploit exogenous industry-level variation in R&D worker quota (R&D workers as an important production factor to generate IP)
- Extending Chen et al. (2020), this paper helps to **explain drivers of implementing BTFs** in merger agreements that arise from a legal, regulatory perspective (e.g., if the proposed deal results in a highly concentrated industry)

Main Findings:

- Target firm's IP value is strongly positively related to both the inclusion and the absolute and relative size of the negotiated BTF**
- A one-standard deviation increase in target's knowledge capital stock is associated with a **statistically and economically significant 0.57% increase** in the size of the BTF, whereas BTF size is measured as the dollar value of the negotiated BTF scaled by target firm's market capitalization (the average BTF size is 1.73% in the sample, and 1.23% when scaled by deal value instead)
- On average, for every dollar of target firm's R&D capital stock, roughly **16 cents of protective share is incorporated in the BTF**
- The relation between target firm's innovation activity and BTF size is increasing in the degree of **technological proximity** (Bloom et al. (2013)) and **product market rivalry** (Hoberg and Phillips (2010, 2016)) between acquirer and target

Empirical Design, Depend. Variable, and Variable of Interest:

$$BTF\ Size_{i,t} = a_{i,t} + \beta_1 Tgt\ Know\ Cap\ Stock_{i,t} + \beta_2 Tgt\ Org\ Cap\ Stock_{i,t} + \beta_3 Tgt\ Total\ Intangibles\ Ratio_{i,t-22} + \beta_4 Tgt\ Tangibility_{i,t-22} + \beta_5 Tgt\ Market-to-Book_{i,t-22} + \beta_6 TTF\ Size_{i,t} + \eta\ Deal\ Characteristics_{i,t} + \theta\ Acq\ Firm\ Characteristics_{i,t} + \varphi\ Acq\ Industry \times Year\ FE_{i,t} + \vartheta\ Tgt\ Industry\ FE_{i,t} + \varepsilon_{i,t}$$

Coefficient of primary interest

$$BTF\ Size_{i,t} = \frac{BTF\ Dollar\ Amount_{i,t}}{Tgt\ Market\ Cap_{i,t-42}} \quad Tgt\ Know\ Cap\ Stock_{i,t} = \frac{\sum_{k=1}^{10} (1 - \delta_G)^k R\&D_{i,t-k}}{Tgt\ Market\ Cap_{i,t-42}}$$

$$Tgt\ Org\ Cap\ Stock_{i,t} = \frac{\sum_{k=1}^{10} (1 - \delta_S)^k \gamma\ SG\&A_{i,t-k}}{Tgt\ Market\ Cap_{i,t-42}}$$

where *Tgt Know Cap Stock* and *Tgt Org Cap Stock* are proxies and based on Ewens et al. (2020) industry-specific depreciation parameter estimates for intangible capital stocks (δ and γ)

Data:

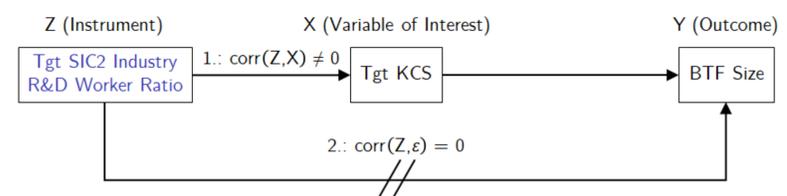
(Source: S&P Capital IQ, Compustat, SEC EDGAR database)

- 769 public-public transactions (closed or withdrawn between 01/2004 and 12/2017)
- Both the acquirer and the target are located primarily in the U.S. (HQs)
- Acquirer holds < 50% of target's stock prior to the transaction, deal value > \$1mn
- Target must have filed merger documents with the SEC
- Target must have valid Compustat data on either R&D or SG&A spending in at least one of the 10 years preceding the deal announcement year

Empirical Results – Baseline Regression:

Dependent Variable	BTF Dummy		BTF Size	
	Regression Type	(1) Logit FE	(2) Linear FE	(3) Tobit FE
Tgt Know Cap Stock		0.954** (0.400)	1.051*** (0.267)	3.062*** (0.589)
Tgt Org Cap Stock		0.043 (0.181)	0.178 (0.258)	0.731 (0.726)
Tgt Initiation		-0.518** (0.213)	-0.793** (0.316)	-2.919*** (0.906)
Cash Only		-0.924*** (0.280)	-0.668* (0.349)	-3.116*** (1.081)
Post Closing Highly Conc Industry		0.665* (0.357)	2.188** (0.880)	4.276*** (1.578)
Other Acq, Tgt, & Deal Controls	Yes	Yes	Yes	Yes
Acq Ind. × Year & Tgt Ind. FE	Yes	Yes	Yes	Yes
Obs. (Pseudo R ² / Adjusted R ²)		769 (0.302)	769 (0.103)	769 (0.138)

Addressing Endogeneity – Instrument Variables Approach:



Dependent Variable	BTF Size			
	1 st Stage		2 nd Stage	
	(1)	(2)	(3)	(4)
Tgt Know Cap Stock*		5.073** (2.141)		3.670** (1.643)
Tgt SIC2 Industry R&D Worker Ratio	1.419*** (0.383)		1.297*** (0.393)	
Tgt Trade Secrecy Mention Count in 10-K			0.020** (0.009)	
Other Controls & FE	Yes	Yes	Yes	Yes
1 st Stage F ^{stat} -statistic (MOP) {p-value}	13.701 {0.000}		10.329 {0.000}	
J-statistic (Sargan-Hansen) {p-value}				0.780 {0.377}
Obs. (Adjusted R ²)	753 (0.407)	753 (0.102)	735 (0.423)	735 (0.032)

Robustness Tests:

- Subsample Tests:** Relation is **more pronounced**, if the target is a **pioneer in its technology sector**, operates in an industry that **sells unique products**, is assigned to the **hightech or healthcare industry**, and if the target **mentions "trade secrets" in its 10-K report** filed with the SEC prior to announcement
- Relation holds independent of scaling method, missing R&D dummy, and degree of information diffusion from target to acquirer (at least quantitative dimension)
- Tgt Knowledge Capital Stock** as a proxy variable for IP shows a persistently strong correlation with **patent value and patent count** (Kogan et al. (2017))

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