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$$TS_P^* = S_{B,0}\Phi \left( \frac{\frac{\ln S_{B,0} - \ln S_{M,0}}{1 - \frac{\sigma_M}{\sigma_B}\rho} + 0.5\sigma_B^2 T - 0.5\rho\sigma_M\sigma_B T}{\sigma_B\sqrt{T}} \right) \left( \frac{\frac{\ln S_{B,0} - \ln S_{M,0}}{1 - \frac{\sigma_M}{\sigma_B}\rho} + 0.5\rho\sigma_M\sigma_B T - 0.5\sigma_B^2 T}{\sigma_B\sqrt{T}} \right) - S_{M,0}\Phi \left( \frac{\frac{\ln S_{B,0} - \ln S_{M,0}}{1 - \frac{\sigma_M}{\sigma_B}\rho} + 0.5\rho\sigma_M\sigma_B T - 0.5\sigma_B^2 T}{\sigma_B\sqrt{T}} \right) \left( \frac{\frac{\ln S_{B,0} - \ln S_{M,0}}{1 - \frac{\sigma_M}{\sigma_B}\rho} + 0.5\rho\sigma_M\sigma_B T - 0.5\sigma_B^2 T}{\sigma_B\sqrt{T}} \right) \quad (14)$$

**Proof:** See Appendix for the proof.

We can write  $Pe^{-rT} = E^Q[e^{-rT}\max(S_{B,T} - (K - P), 0)] - 0.5(TS_P)$ . This illustrates that the contract resembles a call option. In particular, the first term on the right side resembles the Black-Scholes price (Black & Scholes, 1973) of a call option on the target firm under the bidder's control with a strike price equal to the difference between the offer price and bidder termination fee.<sup>15</sup> The bidder termination fee is the price of this option less the bidder's share of the total surplus.<sup>16</sup>

## 2.5 When Is It Optimal to Include a Bidder Termination Provision?

With the following proposition, we examine the conditions under which it is optimal to include a bidder termination option in the takeover contract.

**Proposition 2 (Optimality of Inclusion)** *There exists an upper-bound on the covariance of the value of the target under the bidder's control and the target management's control  $\hat{\sigma}_{BM} = \sigma_B^2 > 0$ , such that for any  $\sigma_{BM} < \hat{\sigma}_{BM}$  it is optimal to include a bidder termination provision in the merger contract. Furthermore, the range of the covariance  $\sigma_{BM}$  for which inclusion of a bidder termination fee is preferred, increases with  $\sigma_B$ , the volatility of target's assets under the bidder's control.*

**Proof:** See Appendix for the proof.

<sup>15</sup>As shown above in (7), the payoff to a merger contract with a bidder termination resembles the payoff of a call option. This contract can be decomposed into a merger contract without a bidder termination provision, which has the payoff of a forward contract on the target with a forward price equal to the offer price, and the bidder termination provision alone, which has a payoff resembling that of a put option. Mathematically, the payoff in (7) can be decomposed as  $\max(S_{B,T} - K, -P) = (S_{B,T} - K) + \max(0, K - S_{B,T} - P)$ .

<sup>16</sup>Margrabe (1978) derives a modified version of the Black-Scholes formula (Black & Scholes, 1973) to value the option to exchange one asset for another, such as an exchange offer. We use similar model primitives and the first term in equation (11) somewhat resembles the option value in equation (7) of Margrabe (1978). However, because the focus of our paper is different, our setup incorporates a termination fee, time-varying synergies and gain-sharing and consequently delivers distinct analytical results.

It is only optimal to include a bidder termination provision in the merger agreement if the ex-ante expected total surplus created is larger with inclusion of the provision. The proposition above implies that when the covariance of the value of the target to the bidder and the stand-alone value of the target ( $\sigma_{BM}$ ) is higher,  $S_{B,T}$  is less likely to fall below  $S_{M,T}$  and there is therefore little incremental value to including a bidder termination provision. Furthermore, fixing  $\sigma_{BM}$ , when the volatility of the target's value to the bidder ( $\sigma_B$ ) is higher,  $S_{B,T}$  is more likely to fall below  $S_{M,T}$  and a bidder termination provision is more valuable.<sup>17</sup> Note that if the value of the target is always higher under the bidder's control than under the existing management's control, then it is never optimal to include a bidder termination option in the deal. This is equivalent to having a large  $\sigma_{BM}$  that is greater than  $\hat{\sigma}_{BM}$ .

## 2.6 Comparative Statics

In this section, we derive the comparative statics of the model with respect to the key model parameters,  $T$  and  $\sigma_B$ . As the derivatives for these parameters are complex in nature, we present the comparative statics using plots for the bidder termination fee as a fraction of the offer price,  $p^*$  in Figure 1.<sup>18</sup>

The bidder termination fee is increasing in the expected time to completion  $T$ . The intuition for this result is that the value of the real option to abandon the takeover increases with the time to maturity (completion). Fixing  $\rho$  equal to 0.2, (the average  $\rho$  in our sample), the bidder termination fee increases with the volatility of the target's assets under the bidder's control,  $\sigma_B$ .<sup>19</sup>

When  $\rho = 0$ , the comparative statics can be derived in closed form (See the Appendix). The

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<sup>17</sup>We assume that  $S_{B,0}$  and  $S_{M,0}$  are exogenously given and that  $S_{B,0} > S_{M,0}$ . That is, we assume that the bidder does not initiate a deal if at the time of the offer the value of the target under bidder's control is not larger than the stand alone value of the target. Examining the timing of the bidder's offer is beyond the scope our paper. It is important to note however that in a framework where the timing of the bidder's offer is endogenous (e.g. Morellec and Zhdanov (2005)) the bidder only makes an offer when the ratio  $\frac{S_{B,0}}{S_{M,0}}$  exceeds a threshold. The optimal timing of the offer thus reduces the probability that  $S_{B,T} < S_{M,T}$ . Although this makes the termination option less valuable, it does not eliminate its value. Therefore, even if the bidder's offer is optimally timed, a bidder termination provision can still be valuable and our model's predictions would still hold. Furthermore, because delaying an offer has costs (e.g. increased competition), a deal that is not "optimally timed" that includes a termination provision may be superior to a later deal that does not include a termination provision.

<sup>18</sup>The comparative statics for the dollar value of the bidder termination fee are similar.

<sup>19</sup>When  $\sigma_{BM}$  is close to  $\sigma_B^2$  or when  $\rho$  is very high (fixing  $\sigma_M$ ), the inclusion of bidder termination provision is not optimal. For example, when  $\sigma_B^2 = \sigma_{BM}$  we have  $TS = 0$  or  $P = K$ . However, whenever the inclusion of the bidder termination option is optimal, we have  $P^* < K^*$  and the bidder termination fee increases in  $\sigma_B$ .

results for the general case illustrated in Figure 1 are consistent with the special case where  $\rho = 0$ . For  $\sigma_B$ , when  $\rho = 0$ , inclusion of the bidder termination option is always preferred. Therefore  $P^* < K^*$  and an increase in  $\sigma_B$  increases the chance that  $S_{B,T}$  would fall below  $S_{M,T}$  and hence increases the value of the termination fee.

## 2.7 Empirical Predictions

Our simple model generates testable predictions about the inclusion of the bidder termination provision in takeover agreements. A corollary of Proposition 2 is that the inclusion of a bidder termination provision is optimal if  $\sigma_B^2 > \hat{\sigma}_B^2$  where  $\hat{\sigma}_B^2 = \sigma_{BM}$ . The range of model parameters where inclusion of a bidder termination provision is preferred therefore increases with  $\sigma_B$  and decreases with  $\sigma_{BM}$ . Furthermore, in practice some deals may not include a bidder termination provision because the increase in expected surplus associated with the termination option does not exceed the cost of negotiating this option. While we do not observe the negotiation costs, we expect a bidder termination provision to be included if the associated increase in expected surplus is large enough. A bidder termination provision is therefore more likely to be included when the associated expected surplus is higher. Proposition 2 implies that the expected surplus with a bidder termination provision ( $TSP$ ) increases with  $\sigma_B$ , decreases with  $\sigma_{BM}$ , and increases with  $T$ . From this we derive the predictions that the likelihood that a bidder termination provision is included in the takeover agreement:

1. Increases with volatility of the target's assets under the bidder's control.
2. Decreases with the covariance between the value of the target's assets under the bidder's control and the stand-alone value of the target's assets.
3. Increases with the length of time between when the takeover agreement is signed and when the takeover is completed.

The comparative statics of the previous section also generate predictions about the size of the bidder termination fee. First, the size of the bidder termination fee relative to the offer price ( $p^*$ ) is expected to increase monotonically with  $\sigma_B$  when  $\rho$  is moderately positive or negative, which

is likely to be characteristic of the sample we study.<sup>20</sup> Second, the size of the bidder termination fee relative to the offer price ( $p^*$ ) is expected to increase monotonically with  $T$ . This results in predictions that the size of the bidder termination fee as a fraction of the total transaction value:

1. Increases with the volatility of the target’s assets under the bidder’s control.
2. Increases with the expected time taken from the announcement of the takeover to completion or withdrawal.

Although a takeover is set up as a simple cash transaction in our framework for tractability, the intuition may also be extended to deals where the method of payment is the bidder’s stock. If stock is used as a method of payment, the offer price  $K$ , rather than being fixed, will vary with the price of the bidder’s stock. Provided that the bidder’s stock price and  $S_B$  are not perfectly correlated, some of the variation in  $K$  will be “exogenous” to our setup and our framework’s intuition will thus still hold. Our empirical predictions therefore apply to deals with either cash or stock (or a combination) as a method of payment.

## 3 Data

### 3.1 Sample Construction

Our sample of takeover announcements is obtained from Thomson Reuters’ SDC Platinum database. We search for mergers and acquisitions that were either completed or withdrawn, where the bidder sought to acquire an interest in the target firm of at least 90%. In order to ensure the availability of data on both the target and bidder that we require, we further restrict the sample to announcements of transactions where both parties were publicly-listed companies domiciled in the United States. We obtain information on transaction characteristics, including information on bidder termination provisions, from SDC. For both the target and the bidder, we require the availability of accounting data in Compustat as at the fiscal year end immediately preceding the merger announcement and daily stock return data in CRSP. We restrict our sample to transactions announced between 1997 and 2013 which results in a final sample consisting of 2078 announced bids.

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<sup>20</sup>In our sample, our proxy for  $\rho$ , the correlation between the value of the target’s assets under the bidder’s control and the assets’ stand alone value, has a mean, median and 90<sup>th</sup> percentile of 0.20, 0.15 and 0.51, respectively.

Although the first reported inclusion of a bidder termination provision in SDC was in May of 1985, we choose to focus on deals announced in 1997 and onwards because Boone and Mulherin (2007) identify substantial underreporting of inclusion of target termination provisions in SDC data when compared to SEC filings for takeovers announced between 1989 and 1999. They report that there is less underreporting from 1997 onwards, although this still persists. Jeon and Ligon (2011) also find that SDC underreports the inclusion of target termination provisions in their sample of deals involving publicly listed targets announced between 2001 and 2007. Therefore a potential concern for us that the inclusion of bidder termination provisions is also significantly underreported in our sample like the inclusion of target termination provisions. We find however, that the underreporting is not as severe in our sample, perhaps because we restrict our sample to deals that involve a publicly-listed bidder. We also find that the underreporting is more severe for target termination provisions than bidder termination provisions which are the focus of our study.<sup>21</sup>

### 3.2 Variable Measurement

For our empirical analysis, we require measures of the volatility of the value of the target's assets under the bidder's control as well as the covariance of the value of the target's assets under the bidder's control with the stand-alone value of the target's assets. The value of the target's assets under the bidder's control is however unobservable to an econometrician and therefore challenging to measure.

To construct a proxy, we conjecture that the value of managed assets is determined by the stand-alone value of the productive assets and the value added by the management of the assets through tangible assets and intangible assets such as human capital. This implies that the value of the target's assets under the bidder's control will be determined by both the stand-alone value of the target's assets and the value added by the bidder managing the target's assets (i.e. the value of the bidder's control over the assets). Therefore, the volatility of the target's assets under the

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<sup>21</sup>Jeon and Ligon (2011) find that the underreporting of target termination provisions in their sample is most severe in years 2002, 2003 and 2006. They find that the underreporting is substantially less severe in the other years of their sample period (2001-2007). We verify the SDC data for the transactions in our sample (297) that were announced in years 2002, 2003 and 2006 by checking the SEC filings made in connection with these transactions. We find that 21 deals SDC reported as not having a bidder termination provision in fact had one. We find that there are no statistically or economically significant differences in the means of our variables of interest between the 21 deals with erroneously reported bidder termination provision inclusion and the other deals that included bidder termination provisions either from the 2002, 2003 and 2006 subsample or from our full sample.

bidder's control may be assumed to be a function of both the volatility of the stand-alone asset value as well as the volatility of the value of the bidder's management of the assets. The volatility of the value of the bidder's management is likely to be correlated with the volatility of the bidder's assets, while the volatility of the stand-alone value of the target's assets is likely to be correlated with volatility of the target's assets. To proxy for the volatility of the value of the target's assets under the bidder's control, we therefore use both the bidder and target's asset volatility and remain agnostic about which one is a more appropriate proxy. Furthermore, we use the covariance of the values of the bidder and target's assets as a proxy for the covariance of the value of the target's assets under the bidder's control with the stand-alone value of the target's assets. We compute the bidder's asset volatility,  $\sigma_B^V$ , and the covariance of the bidder and target's asset values,  $\sigma_{BM}^V$ , as follows:

$$\sigma_B^V = \frac{E_B}{V_B} \sigma_B^E, \quad (15)$$

$$\sigma_M^V = \frac{E_M}{V_M} \sigma_M^E, \quad (16)$$

$$\sigma_{BM}^V = \frac{E_B}{V_B} \frac{E_M}{V_M} \sigma_{BM}^E, \quad (17)$$

where  $E_B$  and  $E_M$  are the market capitalizations of the bidder and target,  $V_B$  and  $V_M$  are the enterprise values of the bidder and target computed as the sum of market capitalization and book debt, and  $\sigma_B^E$ ,  $\sigma_M^E$ , and  $\sigma_{BM}^E$  are the annualized volatility of the bidder's stock returns, the annualized volatility of the target's stock returns and the covariance between the stock returns of the bidder and target measured over the 250-trading day period ending 30 trading days before the merger announcement.<sup>22</sup>

We also require a measure of the expected time taken until the completion for each takeover in our sample. To proxy for this variable, we follow Officer (2006) in using the actual time that elapsed between when the transaction was announced and when the transaction was either completed or withdrawn. We construct our measure of the expected time to completion as the natural

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<sup>22</sup>Although we use the bidder and target's equity volatilities to construct proxies for the volatility of the target's value to the bidder, to be sure, we are not implying that a bidder walks away from a takeover because of a drop in the target's equity value.

logarithm of the number calendar days between the date of the announcement and the date of either completion or withdrawal divided by 365.

### 3.3 Bidder Termination Provisions

Figure 2 shows the fraction of deals that included a bidder termination provision for each year of our sample. There appears to be some increase over time in the inclusion of bidder termination provisions in takeovers involving publicly-listed U.S. bidders and targets, though the increase is not monotonic. For instance, during the first three years of our sample 1997, 1998, and 1999, 16% of announced deals included bidder termination provisions on average. During the final three years of our sample, 2011, 2012 and 2013, on average 30% of deals included the provision. The fact that a bidder termination provision is only included in some deals throughout our sample period is consistent with our framework which illustrates that bidder termination provisions are only optimal under some circumstances.

Figure 3 breaks down the fraction of deals in our sample that included a bidder termination fee by the bidder's Fama-French 12 industry classification. Deals involving bidders from the Utilities and Energy industries had the most frequent inclusion of bidder termination provisions, with 38% and 37% of the deals including the provision respectively. Given that Utilities and Energy are both regulated industries, this observation is consistent with anecdotal evidence pointing to the use of bidder termination provisions in deals where regulatory approval is required (Collins, July 20, 2012). Relative to other industries, bidder termination provisions were also relatively frequent in the Consumer Durables (33%) and Chemicals (30%) industries.

Table 1 contains summary statistics for the variables used in our paper that are based on data obtained from SDC, Compustat and CRSP. These variables are defined in Table B1. Table 1 reports that bidder termination fees are present in about 21% of the entire sample (433 deals). The fees payable by bidders who terminate deals with a bidder termination provision are economically large. The table reports that the mean and median bidder termination fee payable are 4% and 3% of the total transaction value.

A target termination provision requires a target to pay a fee to the bidder in the event that

they terminate the takeover agreement. Table 1 reports that 77 % of deals in our sample include a target termination provision. Most often, targets terminate a takeover in order to accept a superior offer. While targets are usually able to terminate a takeover in favour of a superior offer even in the absence of a target termination provision, a target termination provision ensures that the incumbent bidder receives a payment from the target in the form of a target termination fee. A target termination provision therefore potentially provides the incumbent bidder with an advantage by deterring competing bidders. For this reason, the size of target termination fees is restricted by courts in some jurisdictions such as Delaware. In contrast, no such restrictions on the size of bidder termination fees exist. However, the mean and median sizes of target termination fees in our sample are comparable to the mean and median sizes of bidder termination fees. For deals in our sample that include target termination provisions, the mean and median target termination fee as a fraction of transaction value are between 3% and 3.5% (not tabulated).

Collars and lockup options are two other contractual provisions that are included in some transactions that may be related to bidder termination provisions. A collar is a provision accompanying stock offers that essentially fixes the value of the stock payment offered by the bidder over some range of values of the bidder's stock price. A collar therefore provides protection against changes in the value of a bidder's stock offer. According to our framework, a bidder termination provision in contrast provides protection against changes in the bidder's value for the target's assets. Table 1 reports that about 9% of the transactions in our sample have a collar. A lockup option is a provision that gives a bidder the right to purchase shares of the target at a discount to the price payable by a competing bidder. A lockup option may therefore deter bidding competition like a target termination provision. Table 1 reports that about 13% of the transactions in our sample have a lockup option.

Table 1 also compares the summary statistics for the subsample of 433 deals which included bidder terminations to the subsample of 1645 deals that did not. While the table highlights statistically significant differences in the characteristics of deals that include bidder termination provisions relative to those that don't, we defer the discussion of these differences to section 4 where we present our regression analyses.



### 3.4 Why do Bidders Terminate Takeovers?

Table 1 reports that 88% of the deals in our sample were completed. Therefore, 12% of the deals in our sample (245 deals) were subsequently terminated. We further examine these deals by searching for news articles related to them to determine why they were terminated and to classify them as being terminated by either the target, the bidder, or by mutual consent of both parties. We separately examine deals without and with bidder termination provisions. We find that out of 210 terminations of deals that did not include a bidder termination provision, only 13 terminations (6%) were classified as being terminated by the bidder. Reasons these deals were terminated include a breach of deal terms by the target, a material adverse change to the target and anticipated regulatory issues. This suggests that bidders rarely terminate deals and that their ability to do so is restricted to instances where the target violates deal terms or if regulatory issues arise. Therefore, consistent with our framework, it appears that bidders are constrained in their ability to terminate deals in the absence of a bidder termination provision.

In contrast, out of 35 terminations of deals that did include a bidder termination provision, 16 terminations (46%) were classified as being terminated by the bidder.<sup>23</sup> In 15 of these cases, a bidder termination fee was either paid by the bidder (11) or demanded by the target but contested by the bidder (4).<sup>24</sup> The reasons these terminations took place include adverse economic conditions for the bidder, failure of the bidder to secure financing to pay for the transaction, a failure to receive regulatory approval and a discretionary decision by the bidder to terminate the deal. These are generally different from the reasons why bidders terminate deals without bidder termination provisions.<sup>25</sup> As our framework suggests, this is consistent with bidder termination provisions being exercised in situations where the bidder's value for the target's assets might decrease.

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<sup>23</sup>11 of the other 19 terminations were classified as being terminated by targets who received superior offers or whose shareholders did not approve the deals, with the remainder being terminated by mutual consent of both parties.

<sup>24</sup>The remaining case was a termination by the bidder because of a material adverse change to the target and hence the bidder did not pay a termination fee.

<sup>25</sup>The exception is a failure to receive regulatory approval. Even in the absence of a bidder termination provision, deals that do not receive the required regulatory approval may be terminated without recourse against the bidder. Bidder termination provisions are however often used to transfer regulatory risk to the bidder that would otherwise be borne by both parties (Afsharipour, 2010; Collins, July 20, 2012), such as in the Google-Motorola transaction. Our framework suggests why it is appropriate for the bidder to bear the regulatory risk. For instance, a regulator might condition antitrust approval on the bidder taking a certain action such as selling off some of its other assets. In the absence of a bidder termination provision, the bidder is likely to be obliged by the takeover agreement to take the action required by a regulator. Absent this constraint, a bidder may or may not prefer to take the required action and a bidder termination provision could give the bidder the ability to make this choice.

## 4 Empirical Results

### 4.1 The Inclusion of Bidder Termination Provisions in Takeover Agreements

In this section, we present the results of examining the inclusion of the bidder termination provisions in takeover agreements. We estimate logit regressions where the dependent variable equals to one if an announced deal included a bidder termination provision and zero otherwise. Our variables of interest are the bidder's asset volatility (*Bidder Asset Volatility*), the target's asset volatility (*Target Asset Volatility*), the covariance of the bidder and target's asset value (*Bidder-Target Asset Covariance*), and the time taken from the announcement until completion or withdrawal ( $\text{Log}(\text{Time-to-Completion}(\text{Actual}))$ ).

In our analysis, we control for group of deal characteristics that may be associated with the inclusion of bidder termination provisions. We include indicators of whether the deal was an all-cash offer (*Cash Offer*), an all-stock offer (*Stock Offer*), with the omitted category being deals with a mix of cash and stock offered. We include a variable that measures the size of the bidder's existing share of the target's equity (*Bidder Toehold*). We include indicators of whether the deal was a tender offer (*Tender Offer*), involved a hostile approach from the bidder (*Hostile Approach*), and whether the bidder and target belonged to the same Fama-French 49 industry (*Same Industry*). We also include variables that control for the target and bidder's sizes, measured using the natural logarithm of their market capitalizations ( $\text{Log}(\text{Target Market Cap.})$ ,  $\text{Log}(\text{Bidder Market Cap.})$ ) and their market-to-book ratios (*Target Market-to-Book Assets*, *Bidder Market-to-Book Assets*). Lastly, we also include the ratio of the target's market capitalization to the bidder's market capitalization ( $\text{Target Market Cap.}/\text{Bidder Market Cap.}$ ) as a measure of relative size. Year fixed effects are included in our specifications to control for the variation in the inclusion of bidder termination provisions over time (see figure 2). A potential concern is that the residuals in our regressions are correlated with our main variables of interest. In particular, there is variation in the inclusion of bidder termination provisions across bidder's industries as shown in figure 3. Furthermore, the bidder's asset volatilities are likely to be correlated within industries. We therefore use standard errors that are clustered by the bidder's Fama-French 49 industry to compute  $t$ -statistics (Petersen, 2009).

The results of this analysis are presented in Table 2. In model (1) of Table 2, the coefficient on the bidder’s asset volatility is positive and statistically significant. The coefficient implies that a one-standard deviation increase in the bidder’s asset volatility is associated with an 4.7 percentage point increase in the probability that a bidder termination provision is included in the takeover agreement. The coefficient on the covariance between the bidder and target asset values is negative and statistically significant. A one-standard deviation decrease in this variable is associated with an 2.1 percentage point increase in the probability that a bidder termination provision is included. Recall that we use the bidder’s asset volatility to proxy for the volatility of the bidder’s value for the target’s assets. Similarly, we use the covariance between the bidder and target asset values to proxy for the covariance between the bidder’s value for the target’s assets and the stand-alone value of the target’s assets. This result is therefore consistent with our framework which predicts that a bidder termination provision will be included when it is likely that the bidder’s value for the target’s assets will fall below the stand-alone value of the target’s assets. This is more likely when the volatility of the bidder’s value of the target’s assets is higher, and when this value covaries less with the stand-alone value of the target’s assets. The coefficient on our third variable of interest, the natural logarithm of the time taken until the completion or withdrawal of the deal is positive and statistically significant.<sup>26</sup> A one-standard deviation increase in this variable is associated with a 5.7 percentage point increase in the probability that a bidder termination provision is included. Given that the unconditional probability that a deal includes a bidder termination provision is about 21%, the marginal effects for our variables of interest imply economically significant associations with the inclusion of bidder termination provisions.

In model (2), we replace the bidder’s asset volatility with the target’s asset volatility as a proxy for the volatility of the target’s value under the bidder’s control.<sup>27</sup> Consistent with model (1), we

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<sup>26</sup>A potential concern is that termination fees will not be observed in deals that are withdrawn early before a merger agreement is finalized. Early withdrawal may therefore be correlated with both a lower time-to-completion and the absence of termination provisions. To ensure that this is not driving the relationship that we observe for our time-to-completion variable, in untabulated analysis, we also include an indicator of whether a deal was subsequently completed in our specifications and find that this does not alter the significance of our results. We also find that excluding deals that were potentially terminated prior to finalizing a merger agreement does not alter the significance of our results.

<sup>27</sup>We do not include the bidder and target’s asset volatilities together in the same specification because the two variables have a correlation coefficient of 0.77 in our sample. In analysis that we do not tabulate for brevity, we run a non-linear regression modeling the inclusion of bidder termination provisions in which we include a volatility variable that is a linear combination of the bidder’s and target’s asset volatilities. We find that both variables have a positive and statistically significant association with the inclusion of a bidder termination provision.

find that the coefficient on the target's asset volatility is positive and statistically significant and has a magnitude similar to that of the bidder's asset volatility. A one-standard deviation increase in this variable is associated with a 5.2 percentage point increase in the probability that a bidder termination provision is included in the takeover agreement.<sup>28</sup>

The indicators for the method of payment indicate that bidder termination provisions are more common in all-stock offers, consistent with Bates and Lemmon (2003). While the coefficient on the stock offer indicator is positive, it is not statistically significant in model (1) but is in model (2) and subsequent specifications. The coefficient on the size of the bidder's toehold is negative and statistically significant suggesting that deals where bidders have existing toeholds may be negotiated differently.<sup>29</sup> We also find that the indicator of a hostile approach has a negative and statistically significant coefficient implying that bidder termination provisions are more likely to be included during friendly deal negotiations. We do not find that whether a deal is tender offer or was within the same industry are associated with the likelihood that a bidder termination provision is included.

Officer (2003) suggests that bidder termination provisions are a feature of mergers-of-equals where targets with relatively high bargaining power are able to negotiate a reciprocal termination fee arrangement. We find that the sizes of the target and bidder have statistically significant positive and negative associations with the inclusion of the bidder termination provision respectively. While Table 1 indicates that the relative size is on average higher in deals with bidder termination provisions, we find that controlling for the sizes of the target and bidder, the relative size does not have a statistically significant association with the inclusion of bidder termination provisions. Finally, the target's market-to-book ratio does not have an association with the inclusion of bidder termination provisions and the bidder's market-to-book ratio has a positive association with the inclusion of bidder termination provisions that is statistically significant in model (2).

In models (3) and (4), we include as a control variable an indicator of whether the deal included

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<sup>28</sup>In untabulated analysis, we also examine whether the inclusion of bidder termination provisions is related to market risk. We proxy for market risk using the price of the VIX one month before the takeover announcement but find that it does not have a statistically significant association with the inclusion of bidder termination provisions. We also find that it does not have a statistically significant association with the size of the bidder termination fee which we examine in the next section.

<sup>29</sup>Bates and Lemmon (2003) find a similar relationship between target termination provisions and bidder toeholds.

a target termination provision (*Target Termination Provision*) and find that the coefficient on this variable is positive and statistically significant. This is consistent with the observation that the bidder termination fee is very often accompanied by a target termination provision which is more frequently included in takeover agreements. We also include an indicator of whether the deal included a collar (*Collar*) and find that the coefficient on this variable is negative and statistically significant. Because collar provisions provide protection against changes in the value of stock offers and thus make stock offers more similar to cash offers, this is consistent with our finding that stock offers are more likely to include bidder termination provisions. We also include an indicator of whether the deal included a lockup option (*Lockup Option*) and find that the coefficient on this variable is not statistically significant. Our main results remain similar in these specifications.

Bidder termination provisions are known to be used when a deal is potentially subject to anti-trust concerns (e.g. Sorkin, De La Merced, and Wortham (March 20, 2011)). To ensure that our results are not being driven by such deals alone, in models (5) and (6), we include the Herfindahl-Hirschmann index of the bidder's Fama-French 49 industry (*Bidder Industry HHI*), which measures industry concentration, as a control variable. We also include an interaction of this variable with the indicator of whether the bidder and target operate in the same Fama-French 49 industry to capture mergers occurring within an already concentrated industry. Neither of these variables, however, have a statistically significant association with the inclusion of bidder termination provisions. Bidder termination provisions are also known to be used when there is uncertainty for the bidder in obtaining financing (e.g. Barusch (February 15, 2013)). To ensure that this is not driving our results, we also include an indicator of whether the bidder was classified as a financial buyer as we expect such bidders to be more prone to financing risk. Consistent with this, we find a positive and statistically significant coefficient on this variable indicating that deals involving financial buyers are more likely to include a bidder termination provision. Our main results however remain similar.

We also investigate the hypothesis that the inclusion of bidder termination provision is driven by the target's uncertainty about the bidder's ability to complete the deal. To test this, we include the number of analysts following the bidder (*Bidder Analyst Following*) and the precision of the bidder's analyst forecasts (*Bidder Analyst Forecast Precision*) in model (5) and (6) as measures of

uncertainty about the bidder. We find that neither variable has a statistically significant impact on the inclusion of bidder termination provisions and that our main results are still similar.

## 4.2 The Determinants of Bidder Termination Fees

In this section, we present the results of examining the determinants of the size of the fee payable by the bidder to the target upon terminating the takeover agreement. We estimate OLS regressions where the dependent variable is the value of the bidder termination fee divided by total value of the transaction. The sample consists only of takeovers that included a bidder termination provision. Our variables of interest are the bidder's asset volatility, the target's asset volatility and the time taken from the announcement until completion or withdrawal. Our regression specifications include the same set of control variables as those of the previous section.

The results of this analysis are presented in Table 3. In model (1), the coefficient on the bidder's asset volatility is positive and statistically significant. A one-standard deviation increase in the bidder's asset volatility is associated with an increase of about 0.5 percentage points in the size of bidder termination fee relative to the transaction value. The coefficient on the natural logarithm of the time taken until the completion or withdrawal is also positive and statistically significant. A one standard deviation increase in this variable is associated with an increase of about 0.7 percentage points in the size of the bidder termination fee relative to the transaction value. Given that the mean size of the bidder termination fee relative to transaction value is about 4% in our sample, these coefficients imply economically significant impacts. These results are consistent with our empirical predictions from the relationship between the termination fee payable by the bidder and the price of the bidder's real option that is implied by having a bidder termination provision in the takeover agreement. Therefore, like the price of a real option, the size of the fee is shown to increase in the volatility of the underlying asset, which we measure using the bidder's asset volatility, as well as the expected time until the option is exercised, which we measure using the actual time taken from the announcement until the completion of withdrawal of the bid. In model (2), we replace the bidder's asset volatility with the target's asset volatility as a proxy for the volatility of the target's value under the bidder's control. The target's asset volatility also has a coefficient that is positive and statistically significant. A one standard deviation increase in this variable is associated













coefficient on the indicator of whether the deal included a bidder termination provision (*Bidder Termination Provision*) is positive and statistically significant. However, both Bates and Lemmon (2003) and Officer (2003) find that target termination provisions are positively associated with the likelihood that a deal is ultimately successful. Also, as noted previously, bidder termination provisions are almost always accompanied by a target termination provision. Our specification for model (2) therefore additionally includes an indicator of whether the deal included a target termination provision. The coefficient on the target termination provision indicator is positive and statistically significant, confirming the findings of Bates and Lemmon (2003) and Officer (2003). However, the coefficient on the bidder termination provision indicator is not statistically significant, also consistent with findings by Bates and Lemmon (2003) and Officer (2003). This suggests that the positive association with deal success in model (1) was likely to have been driven by the inclusion of target termination provisions and that bidder termination provisions are not associated with a higher likelihood of deal success.<sup>34</sup>

To the extent that higher bidder termination fees are considered a stronger signal of deal-completion intent, one might expect higher bidder termination fees to be associated with a higher likelihood of deal completion. However, Cain, Macias, and Solomon (2014) find that private equity buyers that have previously terminated deals face high bidder termination fees in subsequent transactions. That is, private equity buyers that were perceived, ex-ante, as being less likely to complete deals in fact faced higher bidder termination fees, which is inconsistent with signaling. Also inconsistent with signaling, in analysis that we do not tabulate we find that higher bidder termination fees are negatively associated with the probability of a deal being completed. Signaling is therefore an unlikely explanation for the use of bidder termination provisions.

#### **4.5 Bidder Termination Provisions and Wealth Gains from Takeovers**

Our simple model suggests that the inclusion of a bidder termination provision can potentially increase the expected joint takeover gains. Here, to test whether bidder termination provisions are

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<sup>34</sup>Our classification of successful versus terminated deals encompasses terminations by any party rather than just deals that were terminated by bidders. This is because deals may also be terminated by targets or by mutual consent as a result of bidders' actions, such as failure to effectively cooperate. If we restrict our classification of terminated deals to those that were terminated specifically by bidders, we find similar results (untabulated). We in fact find some evidence that deals with bidder termination provisions are more likely to be terminated by bidders which is inconsistent with a signaling hypothesis.

associated with larger joint takeover gains, we examine the association between bidder termination provisions and the combined gains of the bidder and target. We compute the combined gain of the bidder and target by summing the 3-day cumulative dollar abnormal returns of the target and bidder and then dividing this by the sum of the market capitalizations of the bidder and target 50 trading days before the announcement.

Table 6 presents the results of OLS regressions where the dependent variable is the combined gain of the bidder and target. In model (1) the explanatory variable of interest is the bidder termination provision indicator. The coefficient on this indicator is positive but not statistically significant implying that on average, bidder termination provisions are not associated with larger combined gains for the bidder and target around the takeover announcement. The results are similar when we control for the inclusion of target termination provisions, collars and lockup options (model (2)).

Recall that the increase in expected joint takeover gains from having a bidder termination provision is a result of having a real option that facilitates the termination of takeovers when completion is sub-optimal. Furthermore, in Sub-section 4.3, we found that bidder termination fees were more likely to be priced as real options when they were not set equal to target termination fees. In model (3), we therefore distinguish between bidder termination provisions which were more likely to have been priced as real options and those that weren't. We include an indicator for bidder termination provisions with fees that were not set equal to the fees for accompanying target termination provisions, or if there was no accompanying target termination provision altogether (*Bidder Fee  $\neq$  Target Fee*), and a separate indicator for bidder termination provisions that were accompanied by target termination provisions with equal termination fees (*Bidder Fee = Target Fee*). The coefficient on *Bidder Fee  $\neq$  Target Fee* is positive and statistically significant while the coefficient on *Bidder Fee = Target Fee* is negative but not statistically significant. We observe similar results when we control for the inclusion of target termination provisions, collars and lockup options in model (4).

The results of this section therefore suggest that bidder termination provisions that were more likely to have been included in takeovers for their real option value and priced as such (those with termination fees not equal to target termination fees), are associated with larger joint combined

gains for bidders and targets. In contrast, bidder termination provisions that appear to have been offered as reciprocation for target termination fees (those with termination fees equal to target termination fees) are not associated with larger combined gains for the bidder and target. An appropriate (i.e. optimal) termination fee enhances value by incentivizing a bidder to terminate a deal when completion would destroy value (that is, when the target is worth less to the bidder than on its own). Therefore, a failure to price the termination fee appropriately increases the likelihood that a bidder fails to terminate value-destroying deals, or that a bidder terminates a takeover that is value-enhancing (that is, when the target is worth more to the bidder than on its own). Therefore, put differently, our results suggest that in order for a bidder termination provision to enhance value, the termination fee payable must be priced appropriately, as a real option. Our results therefore lend credence to our real option view of bidder termination provisions.

We note however, that the decision to include a bidder termination provision is likely to be made simultaneously with decisions on other deal terms, which may also be correlated with expected gains. Furthermore, given that there are differences in observable and unobservable characteristics between deals with and without bidder termination provisions, we do not observe for each deal with a bidder termination provision, the equivalent of a counterfactual deal without the provision. We therefore refrain from making a causal interpretation of these results.

## 5 Conclusion

We examine the inclusion of a provision in a takeover agreement that gives a bidder the ability to walk away from the takeover, a contract feature that gives the bidder an option that it is unlikely to otherwise have. We illustrate our insight that a takeover with a bidder termination provision resembles a real option on the assets of the target firm and show that the value of this option lies in facilitating the termination of takeovers which are not optimal at the time of completion. We find that a bidder termination provision is included in takeover agreements when it is more likely to increase the expected takeover gains.

Little guidance exists on assessing when a bidder termination provision is appropriate in practice, an issue which our paper addresses. There is also substantial variation in the size of the fee

payable by the bidder upon termination in practice, and our paper sheds light on why termination fees should be and are higher in some cases than others. Like us, legal scholars such as Afsharipour (2010) and Quinn (2010) have also recognized that the provision has option value but have raised concerns that the pricing of termination fees payable by bidders does not reflect this. Our evidence that the size of the bidder termination fee is in fact associated with the option value of takeovers partially assuages these concerns. However, the fact that bidder termination fees are often set equal to target termination fees may indicate that mis-pricing is indeed taking place. Our paper further suggests that bidder termination provisions potentially create value for both parties and therefore, that a failure to account for the option value of a termination provision may result not only in mis-priced termination fees, but also mis-priced offers and forgone takeover surpluses.

In our framework, the incremental value of having a bidder termination option takes a reduced-form. In practice, the value of the target firm to the bidder could diverge from the target's stand-alone value for numerous reasons. For example, following a failure to secure financing, a bidder's cost of capital may become very high in poor market conditions. Alternatively, regulatory approval for a transaction may be conditioned on the bidder undertaking divestitures which could be particularly costly in times of market-wide distress. Finally, another superior target may emerge and raise the opportunity cost for a bidder already involved in a takeover. Some bidder termination provisions only facilitate termination under such specific scenarios. While our framework is also applicable to these types of provisions, perhaps a more refined set up that incorporates specific frictions in the takeover market is called for. However, pure "option-style" bidder termination provisions that give bidders complete discretion over the termination decision are also observed in practice.

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# Appendix

## A Proofs

### A.1 Proof of Proposition 1

The target's and bidder's shares of the value created by the takeover can be written as follows:

Let  $A \equiv \{S_{B,T} \geq K - P\}$  and  $A^c \equiv \{S_{B,T} < K - P\}$ .

$$\begin{aligned}
G_{Target,0} &= \int_A \int_{S_{M,T}} e^{-rT} (K - S_{M,T}) f_{S_{B,T}S_{M,T}} dS_{M,T} dS_{B,T} \\
&\quad + \int_{A^c} \int_{S_{M,T}} P e^{-rT} f_{S_{B,T}S_{M,T}} dS_{M,T} dS_{B,T} \\
G_{Bidder,0} &= \mathbb{E}^Q[e^{-rT} \max(S_{B,T} - K, -P)] \\
&= \int_A \int_{S_{M,T}} e^{-rT} (S_{B,T} - K) f_{S_{B,T}} f_{S_{M,T}} dS_{M,T} dS_{B,T} \\
&\quad - \int_{A^c} \int_{S_{M,T}} P e^{-rT} f_{S_{B,T}} f_{S_{M,T}} dS_{M,T} dS_{B,T}
\end{aligned} \tag{18}$$

We know that  $TS_P = G_{Target,0} + G_{Bidder,0}$ ,  $G_{Target,0} = 0.5TS$  and  $G_{Bidder,0} = 0.5TS$ . Hence, we can write:

$$TS_P = \int_A \int_{S_{M,T}} e^{-rT} (S_{B,T} - S_{M,T}) f_{S_{B,T}S_{M,T}} dS_{M,T} dS_{B,T} \tag{19}$$

where  $f_{S_{B,T}S_{M,T}}$  is the joint PDF of  $S_{B,T}$  and  $S_{M,T}$ .

Taking advantage of the log normality assumption, we can write:

$$\ln S_{M,T} | \ln S_{B,T} \sim N(\ln S_{M,0} + (r - 0.5\sigma_M^2)T + \frac{\sigma_M}{\sigma_B} \rho (\ln S_{B,T} - \ln S_{B,0} - (r - 0.5\sigma_B^2)T), (1 - \rho^2)\sigma_M^2 T)$$

Therefore, we can write:

$$e^{-rT} \mathbb{E}_{S_{M,T}|S_{B,T}} [S_{M,T}|S_{B,T}] = S_{M,0} \left( \frac{S_{B,T}}{S_{B,0}} \right)^{\frac{\sigma_M}{\sigma_B} \rho} \times e^{\rho T [0.5\sigma_M \sigma_B - 0.5\rho \sigma_M^2 - \frac{\sigma_M}{\sigma_B} r]}$$

Thus,  $TS_P$  can be written as follows:

$$TS_P = E_{S_{M,T}}[e^{-rT} S_{B,T} 1_A] - S_{M,0} e^{\rho T [0.5\sigma_M\sigma_B - 0.5\rho\sigma_M^2 - \frac{\sigma_M}{\sigma_B} r]} E_{S_{B,T}} \left[ \left( \frac{S_{B,T}}{S_{B,0}} \right)^{\frac{\sigma_M}{\sigma_B} \rho} 1_A \right] \quad (20)$$

Using the following property of lognormal distributions we can calculate the expectations and derive an expression for  $TS$ . If  $X \sim \log N(\mu, \sigma)$

$$\int_0^V X^n f(x) dx = e^{n\mu + 0.5n^2\sigma^2} \Phi \left( \frac{\ln V - \mu - n\sigma^2}{\sigma} \right) \left( \begin{aligned} TS_P &= S_{B,0} \Phi \left( \frac{\ln S_{B,0} + (r - 0.5\sigma_B^2)T + \sigma_B^2 T - \ln(K - P)}{\sigma_B \sqrt{T}} \right) \left( \begin{aligned} &- S_{M,0} \Phi \left( \frac{\ln S_{B,0} + (r - 0.5\sigma_B^2)T + \frac{\sigma_M}{\sigma_B} \rho \sigma_B^2 T - \ln(K - P)}{\sigma_B \sqrt{T}} \right) \right) \end{aligned} \right) \quad (21)$$

In this model bargaining powers (0.5 for each party) are exogenously determined. Thus, the target and the bidder share the value created by the takeover ex-post based according their ex-ante bargaining powers. To determine  $K^*$  and  $P^*$ , the target maximizes his share of the total surplus, given the bidder's participation constraint holds. The endogenous choice variables are  $K$  and  $P$ :

$$\begin{aligned} \max_{(P,K)} \quad & G_{Target,0} \\ \text{s.t.} \quad & \\ & G_{Bidder,0} = 0.5(TS_P) \end{aligned}$$

Substituting for  $G_{Target,0}$ ,  $G_{Bidder,0}$  and  $TS_P$  from (17) and (20), we can rewrite the optimization

problem as follows:

$$\begin{aligned} \max_{(P,K)} \quad & (0.5)S_{B,0}\Phi\left(\frac{\ln S_{B,0} + (r - 0.5\sigma_B^2)T + \sigma_B^2 T - \ln(K - P)}{\sigma_B\sqrt{T}}\right)\left(\right. \\ & \left. - (0.5)S_{M,0}\Phi\left(\frac{\ln S_{B,0} + (r - 0.5\sigma_B^2)T + \frac{\sigma_M}{\sigma_B}\rho\sigma_B^2 T - \ln(K - P)}{\sigma_B\sqrt{T}}\right)\right)\left(\right. \\ \text{s.t.} \quad & \end{aligned}$$

$$\begin{aligned} & \int_A \left( \int_{S_{M,T}} e^{-rT} (S_{B,T} - K) f_{S_{B,T}S_{M,T}} dS_{M,T} dS_{B,T} - \int_{A^c} \int_{S_{M,T}} P e^{-rT} f_{S_{B,T}S_{M,T}} dS_{M,T} dS_{B,T} \right) \\ & = 0.5S_{B,0}\Phi\left(\frac{\ln S_{B,0} + (r - 0.5\sigma_B^2)T + \sigma_B^2 T - \ln(K - P)}{\sigma_B\sqrt{T}}\right)\left(\right. \\ & \quad \left. - 0.5S_{M,0}\Phi\left(\frac{\ln S_{B,0} + (r - 0.5\sigma_B^2)T + \frac{\sigma_M}{\sigma_B}\rho\sigma_B^2 T - \ln(K - P)}{\sigma_B\sqrt{T}}\right)\right)\left(\right. \end{aligned}$$

From this maximization, we can determine a unique  $(K^*, P^*)$  for every set of model parameters. Noticing that  $TS_P$  is a function of  $K - P$ , we can treat  $K - P$  as one variable and maximize  $TS_P$  with respect to  $K - P$ . The first order condition of maximizing  $TS_P$  leads to

$$\begin{aligned} & \frac{\partial TS_P}{\partial(K - P)} = 0 \\ \Rightarrow \quad & \ln\left(\frac{S_{M,0}}{\left(S_{B,0}\right)^{\frac{\sigma_M}{\sigma_B}\rho}}\right)^{\frac{1}{1 - \frac{\sigma_M}{\sigma_B}\rho}} + rT + 0.5\rho\sigma_M\sigma_B T = \ln(K - P) \\ \Rightarrow \quad & K^* - P^* = S_{B,0}\left(\frac{S_{B,0}}{S_{M,0}}\right)^{-\frac{1}{1 - \frac{\sigma_M}{\sigma_B}\rho}} e^{(r+0.5\rho\sigma_M\sigma_B)T} \end{aligned} \quad (22)$$

Substituting for  $K^* - P^*$ , the optimal  $TS_P$  can be written as

$$\begin{aligned} TS_P^* = \quad & S_{B,0}\Phi\left(\frac{\frac{\ln S_{B,0} - \ln S_{M,0}}{1 - \frac{\sigma_M}{\sigma_B}\rho} + 0.5\sigma_B^2 T - 0.5\rho\sigma_M\sigma_B T}{\sigma_B\sqrt{T}}\right)\left(\right. \\ & \left. - S_{M,0}\Phi\left(\frac{\frac{\ln S_{B,0} - \ln S_{M,0}}{1 - \frac{\sigma_M}{\sigma_B}\rho} + 0.5\rho\sigma_M\sigma_B T - 0.5\sigma_B^2 T}{\sigma_B\sqrt{T}}\right)\right)\left(\right. \end{aligned} \quad (23)$$

Now substituting for  $TS_P^*$  and  $K^* - P^*$  into the binding constraint of the optimization problem,

we can solve for the optimal bidder termination fee  $P^*$ :

$$\begin{aligned}
G_{Bidder,0} &= \mathbb{E}^Q[e^{-rT} \max(S_{B,T} - K, -P)] = 0.5(TS_P^*) \\
&\Rightarrow e^{-rT}P^* = \mathbb{E}^Q[e^{-rT} \max(S_{B,T} - (K - P), 0)] - 0.5(TS_P^*) \Rightarrow \\
P^* &= e^{rT}S_{B,0} N(d_1) - N(d_2) \left(\frac{S_{M,0}}{S_{B,0}}\right)^{\frac{1}{1-\frac{\sigma_M}{\sigma_B}\rho}} e^{0.5\rho\sigma_M\sigma_B T} \left( \right. \\
&\quad \left. -0.5e^{rT}S_{B,0}\Phi\left(\frac{\frac{\ln\frac{S_{B,0}}{S_{M,0}}}{1-\frac{\sigma_M}{\sigma_B}\rho} + 0.5\sigma_B^2 T - 0.5\rho\sigma_M\sigma_B T}{\sigma_B\sqrt{T}}\right) \right) \left( \right. \\
&\quad \left. +0.5e^{rT}S_{M,0}\Phi\left(\frac{\frac{\ln\frac{S_{B,0}}{S_{M,0}}}{1-\frac{\sigma_M}{\sigma_B}\rho} + 0.5\rho\sigma_M\sigma_B T - 0.5\sigma_B^2 T}{\sigma_B\sqrt{T}}\right) \right) \left( \right.
\end{aligned} \tag{24}$$

where

$$\begin{aligned}
d_1 &= \frac{\frac{\ln\left(\frac{S_{B,0}}{S_{M,0}}\right)}{1-\frac{\sigma_M}{\sigma_B}\rho} + 0.5\sigma_B^2 T - 0.5\rho\sigma_B\sigma_M T}{\sigma_B\sqrt{T}} \\
d_2 &= \frac{\frac{\ln\left(\frac{S_{B,0}}{S_{M,0}}\right)}{1-\frac{\sigma_M}{\sigma_B}\rho} - 0.5\sigma_B^2 T - 0.5\rho\sigma_B\sigma_M T}{\sigma_B\sqrt{T}}
\end{aligned} \tag{25}$$

It is also clear that from (21) we can express the optimal offer price,  $K^*$ :

$$K^* = P^* + S_{B,0} \left(\frac{S_{B,0}}{S_{M,0}}\right)^{-\frac{1}{1-\frac{\sigma_M}{\sigma_B}\rho}} e^{(r+0.5\rho\sigma_M\sigma_B)T} \tag{26}$$

## A.2 Proof of Proposition 2

Inclusion of bidder termination provision is optimal iff  $TS_P \geq TS_{NP}$  (Optimality Constraint). The indifference condition is

$$\begin{aligned}
TS_P^* &= S_{B,0} - S_{M,0} \\
&\Rightarrow S_{B,0} \Phi \left( \frac{\left( \frac{\ln S_{B,0} - \ln S_{M,0}}{1 - \frac{\sigma_M}{\sigma_B} \rho} + 0.5 \sigma_B^2 T - 0.5 \rho \sigma_M \sigma_B T \right)}{\sigma_B \sqrt{T}} \right) \left( \right. \\
&\quad \left. - S_{M,0} \Phi \left( \frac{\left( \frac{\ln S_{B,0} - \ln S_{M,0}}{1 - \frac{\sigma_M}{\sigma_B} \rho} + 0.5 \rho \sigma_M \sigma_B T - 0.5 \sigma_B^2 T \right)}{\sigma_B \sqrt{T}} \right) \right) \left( \right. \\
&= S_{B,0} - S_{M,0}.
\end{aligned}$$

It is clear that when  $\frac{\rho \sigma_M}{\sigma_B} = 1$ , the above equation holds. And we have  $\hat{\sigma}_{BM} = \sigma_B^2$  or  $\hat{\rho} = \frac{\sigma_B}{\sigma_M}$ .

When  $\sigma_{BM} > \sigma_B^2$ , we have

$$\begin{aligned}
TS_P &= S_{B,0} \Phi \left( \frac{\ln S_{B,0} + (r - 0.5 \sigma_B^2) T + \sigma_B^2 T - \ln(K - P)}{\sigma_B \sqrt{T}} \right) \left( \right. \\
&\quad \left. - S_{M,0} \Phi \left( \frac{\ln S_{B,0} + (r - 0.5 \sigma_B^2) T + \sigma_{BM} T - \ln(K - P)}{\sigma_B \sqrt{T}} \right) \right) \left( \right. \\
&< (S_{B,0} - S_{M,0}) \Phi \left( \frac{\ln S_{B,0} + (r - 0.5 \sigma_B^2) T + \sigma_B^2 T - \ln(K - P)}{\sigma_B \sqrt{T}} \right) \left( \leq (S_{B,0} - S_{M,0}).
\end{aligned}$$

Therefore, it is not optimal to include a bidder termination option when  $\sigma_{BM} \geq \sigma_B^2$ .

## A.3 Comparative Statics with $\rho = 0$

For every parameter of interest, we derive the comparative statics for both the bidder termination fee  $P^*$  and the bidder termination fee expressed as a percentage of the offer price  $p^* \equiv \frac{P^*}{K^*}$ . When  $\rho = 0$  we can rewrite  $TS^*$  and  $P^*$  as:

$$TS^* = S_{B,0} N(d_1) - S_{M,0} N(d_2) \Rightarrow P^* = 0.5 e^{rT} TS^*$$

We have

$$N'(d_2) = \frac{1}{\sqrt{2\pi}} e^{-0.5d_2^2} = \frac{1}{\sqrt{2\pi}} e^{-0.5d_1^2} \frac{S_{B,0}}{S_{M,0}} = N'(d_1) \frac{S_{B,0}}{S_{M,0}}$$

For any parameter  $x$ , we have

$$\begin{aligned} \frac{\partial TS^*}{\partial x} &= S_{B,0} N'(d_1) \frac{\partial d_1}{\partial x} - S_{M,0} N'(d_2) \frac{\partial d_2}{\partial x} \\ &= S_{B,0} N'(d_1) \left( \frac{\partial d_1}{\partial x} - \frac{\partial d_2}{\partial x} \right) \left( \right) \end{aligned}$$

When  $x \in \{\sigma, T\}$ , we have

$$\begin{aligned} \frac{\partial d_1}{\partial \sigma} - \frac{\partial d_2}{\partial \sigma} &= \sqrt{T} \\ \frac{\partial d_1}{\partial T} - \frac{\partial d_2}{\partial T} &= \frac{\sigma}{2\sqrt{T}} \end{aligned}$$

Therefore, we have

$$\begin{aligned} \frac{\partial P^*}{\partial \sigma} &= 0.5 S_{B,0} e^{rT} N'(d_1) \sqrt{T} > 0 \\ \frac{\partial P^*}{\partial T} &= rP^* + 0.5 S_{B,0} e^{rT} N'(d_1) \frac{\sigma}{2\sqrt{T}} > 0 \end{aligned}$$

Next we derive the comparative statics for the bidder termination fee expressed as a percentage of the offer price

$$p^* \equiv \frac{P^*}{K^*}$$

and it is straightforward to show that

$$\begin{aligned} \frac{\partial p^*}{\partial \sigma} &= 0.5 S_{B,0} e^{rT} N'(d_1) \sqrt{T} \times \frac{e^{rT} S_{M,0}}{(K^*)^2} > 0 \\ \frac{\partial p^*}{\partial T} &= 0.5 S_{B,0} e^{rT} N'(d_1) \frac{\sigma}{2\sqrt{T}} \times \frac{e^{rT} S_{M,0}}{(K^*)^2} > 0 \end{aligned}$$



## B Variable Definitions

**Table B1: Variable Definitions**

This table contains the definitions and descriptions of the variables used in the paper.

Variable	Definition
Bidder Termination Provision	Equals 1 if the takeover includes a provision that permits the bidder to terminate the takeover agreement and 0 otherwise.
Bidder Termination Fee	The value of the fee payable by the bidder to the target upon terminating the takeover agreement.
Bidder Term. Fee/Transaction Value	The value of the bidder termination fee (see Bidder Termination Fee definition) divided by the total value of the transaction.
Target Termination Provision	Equals 1 if the takeover includes a provision that required the target to pay a fee to bidder in the event that the target terminated the takeover agreement and 0 otherwise.
Target Termination Fee	The value of the fee payable by the target to the bidder upon terminating the takeover agreement.
Target Term. Fee/Transaction Value	The value of the target termination fee (see Target Termination Fee definition) divided by the total value of the transaction.
Bidder-Target Asset Covariance	The product of the bidder and target's ratios of their market capitalization to their enterprise values (computed as market capitalization + book debt), multiplied by the annualized covariance between the stock returns of the bidder and target in the 250-trading day period ending 30 trading days before the merger announcement.
Bidder Asset Volatility	The ratio of the bidder's market capitalization to its enterprise value (computed as market capitalization plus book debt), multiplied by the annualized volatility of the bidder's stock returns and the covariance between the stock returns of the bidder and target in the 250-trading day period ending 30 trading days before the merger announcement.
Time-to-Completion (Actual)	The number of days between takeover announcement date the date of completion or withdrawal, divided by 365.
Collar	Equals 1 if the method of payment offered by bidder included stock together with a provision that accommodated changes in the stock exchange ratio conditional on the level of the bidder's stock price at the time of the closing of the merger.
Lockup Option	Equals 1 if the merger agreement includes a provision giving the bidder the right to purchase target shares at a discount to the price payable by a competing bidder.

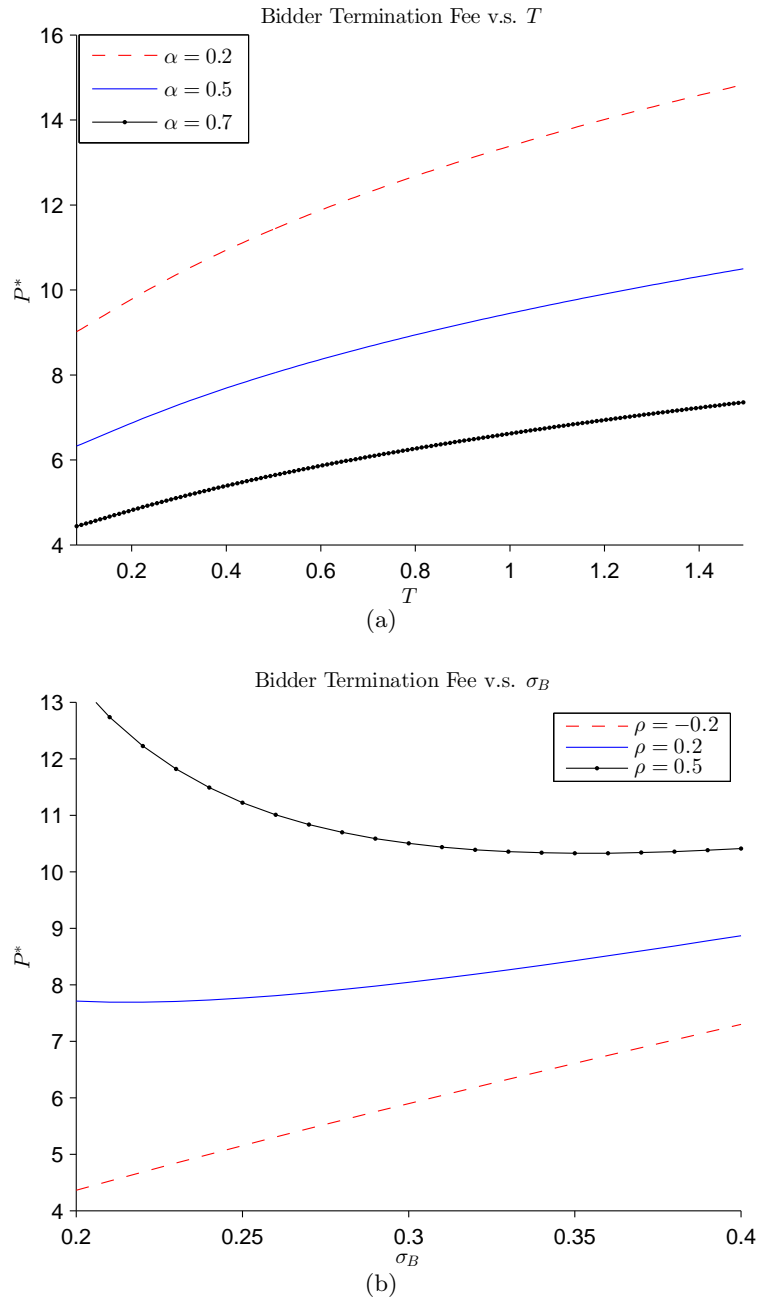
Cash Offer	Equals 1 if the method of payment offered by bidder was consisted only of cash.
Stock Offer	Equals 1 if the method of payment offered by bidder was consisted only of the bidder's stock.
Bidder Toehold	The fraction of the target's shares outstanding held by the bidder at the time of the announcement of the takeover.
Tender Offer	Equals 1 if the bidder made a tender offer.
Hostile Approach	Equals 1 if the bidder's approach to the target was hostile.
Same Industry	Equals 1 if the bidder and target belonged to the same Fama-French 49-Industry Classification.
Financial Buyer	Equals 1 if the bidder was classified as a financial buyer.
Completed Deal	Equals 1 if takeover was completed successfully.
Bidder (Target) Market Capitalization	The market capitalization of the bidder (target) 50 trading days before the takeover announcement.
Bidder (Target) Market-to-Book Assets	The ratio of the bidder's (target's) market value of assets to book value of assets computed following the definitions in Baker and Wurgler (2002)
Bidder Industry HHI	The Herfindahl-Hirschman index of the bidder's Fama-French 49-Industry.
Bidder Analyst Following	The number of analysts following the bidder.
Bidder Analyst Forecast Precision	Equals 1 divided by the standard deviation of analyst forecasts for firms followed by more than one analyst. Equals 0 for firms followed by one or no analysts.
Combined Gain	The sum of the target and bidder's cumulative dollar abnormal returns in the three period around the announcement of the takeover divided by the sum of the target and bidder's market capitalizations 50 trading days before the takeover announcement date.

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**Figure 1:**

Bidder Termination Fee as a function of  $T$  and  $\sigma_B$

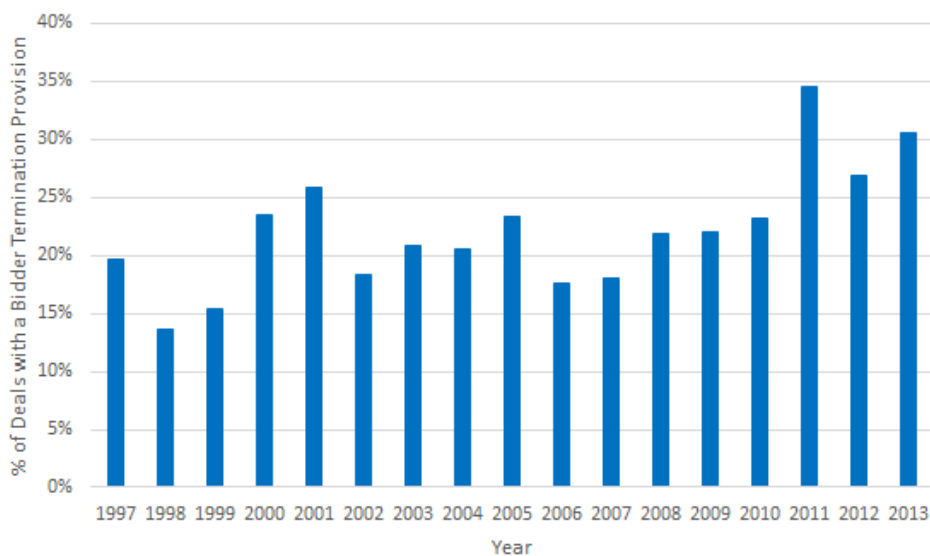
The base parameters for the graphs are  $r = 0.04$ ,  $S_{M,0} = 100$ ,  $S_{B,0} = 110$ ,  $\sigma_M = 0.2$ ,  $\sigma_B = 0.3$ ,  $\alpha = 0.5$ ,  $T = 0.5$ , and  $\rho = 0.2$ . In each graph only one parameter changes and the others take the base parameter values. In Figure 1(a)  $T$  changes from 0.1 years to 1.5 years. In Figure 1(b)  $\sigma_B$  changes from 0.2 to 0.6.



**Figure 2:**

Fraction of Deals with Bidder Termination Provisions by Year

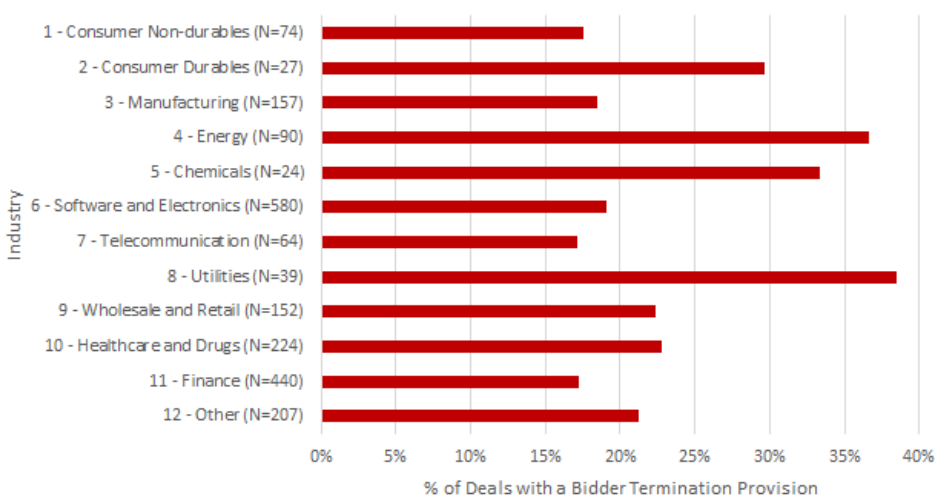
This graph shows the fraction of announced takeovers that included bidder termination provisions in a sample of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms. The data are grouped by the year the takeover was announced.



**Figure 3:**

Fraction of Deals with Bidder Termination Provisions by Industry

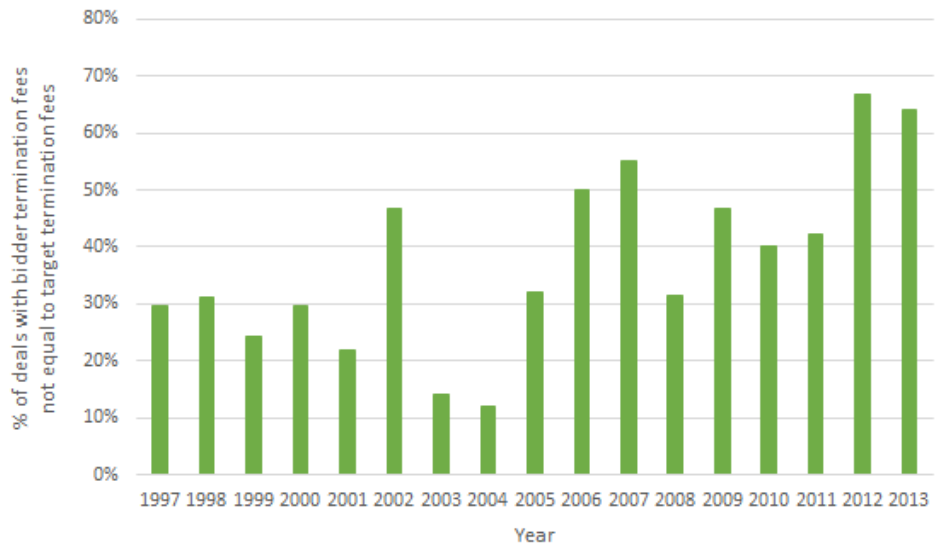
This graph shows the fraction of announced takeovers that included bidder termination provisions in a sample of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms. The data are grouped by the bidder's Fama-French 12-industry classification.



**Figure 4:**

Fraction of Deals with Bidder Termination Fees Not Equal to Target Termination Fees

This graph shows the fraction of announced takeovers where the bidder termination fee was different from the target termination fee. The sample consists of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms. The data are grouped by the year the takeover was announced.



**Table 1:****Descriptive Statistics for Target, Acquirer and Transaction Characteristics**

This table reports descriptive statistics for the variables used in our study of bidder termination provisions. The sample consists of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms. All variables are defined in Table B1. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively, for the difference in means (*t*-test) and medians (Wilcoxon signed-rank test) between the samples of deals with and without bidder termination provisions.

	All Deals (N=2078)			Deals with a Bidder Termination Provision (N=433)		Deals without a Bidder Termination Provision (N=1645)	
	Mean	Median	Std. Dev.	Mean	Median	Mean	Median
Bidder Termination Provision	0.21	0.00	0.41	1.00	1.00		
Bidder Termination Fee	15.40	0.00	107.35	73.92	15.00		
Bidder Termination Fee/Transaction Value	0.01	0.00	0.02	0.04	0.03		
Target Termination Provision	0.77	1.00	0.42	0.96	1.00	0.72***	1.00***
Target Termination Fee	31.86	5.50	106.19	58.41	15.00	24.87***	4.00***
Target Termination Fee/Transaction Value	0.03	0.03	0.02	0.03	0.03	0.02***	0.03***
Bidder-Target Asset Covariance	0.03	0.01	0.08	0.04	0.01	0.03***	0.01***
Bidder Asset Volatility	0.29	0.22	0.26	0.33	0.27	0.28***	0.21***
Target Asset Volatility	0.36	0.29	0.31	0.38	0.30	0.35*	0.29
Time-to-Completion (Actual)	0.35	0.31	0.22	0.41	0.35	0.34***	0.29***
Log(Time-to-Completion (Actual))	-1.22	-1.17	0.63	-1.02	-1.05	-1.28***	-1.23***
Collar	0.09	0.00	0.28	0.07	0.00	0.09*	0.00
Lockup Option	0.13	0.00	0.33	0.11	0.00	0.13*	0.00
Cash Offer	0.34	0.00	0.47	0.20	0.00	0.37***	0.00***
Stock Offer	0.32	0.00	0.47	0.39	0.00	0.30***	0.00***
Bidder Toehold	0.08	0.00	0.78	0.00	0.00	0.10***	0.00**
Tender Offer	0.16	0.00	0.37	0.09	0.00	0.18***	0.00**
Hostile Approach	0.02	0.00	0.14	0.01	0.00	0.02**	0.00**
Same Industry	0.62	1.00	0.48	0.67	1.00	0.61**	1.00**
Financial Buyer	0.04	0.00	0.19	0.07	0.00	0.03***	0.00***
Completed Deal	0.88	1.00	0.32	0.93	1.00	0.87***	1.00***
Target Market Capitalization	993.97	181.89	3298.87	1505.46	336.12	859.33***	156.76***
Log(Target Market Cap.)	12.20	12.11	1.74	12.71	12.73	12.07***	11.96***
Target Market-to-Book Assets	1.83	1.22	1.97	1.96	1.33	1.80	1.18**
Bidder Market Capitalization	14808.30	1677.69	43580.19	9186.44	1240.85	16288.09***	1768.95***
Log(Bidder Market Cap.)	14.47	14.33	2.05	14.10	14.03	14.57***	14.39***
Target Market Cap./Bidder Market Cap.	0.28	0.13	0.44	0.44	0.34	0.24***	0.10***
Bidder Market-to-Book Assets	2.25	1.43	3.03	2.44	1.46	2.20	1.41*
Bidder Industry HHI	0.05	0.04	0.05	0.05	0.04	0.05	0.04
Bidder Analyst Following	9.73	7.00	9.29	8.30	7.00	10.10***	7.00***
Bidder Analyst Forecast Precision	30.26	20.00	34.10	27.21	14.29	31.07**	20.00**
Combined Gain	0.01	0.01	0.07	0.01	0.01	0.01	0.01

**Table 2:****The Inclusion of Bidder Termination Provisions in Takeover Agreements**

This table reports estimates from logit regressions that examine the inclusion of bidder termination provisions in takeover agreements. The sample consists of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms. The dependent variable equals 1 if the takeover agreement included a bidder termination provision. The explanatory variables are defined in Table B1. Year fixed effects are included. *t*-statistics are computed with standard errors clustered at the bidder's Fama-French 49-industry level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
	=1 if deal includes a Bidder Termination Provision					
Constant	-1.749*** (-4.32)	-1.715*** (-4.34)	-3.465*** (-4.24)	-3.432*** (-4.31)	-3.301*** (-4.09)	-3.289*** (-4.16)
Bidder Asset Volatility	1.372*** (3.87)		1.110*** (3.14)		1.090*** (3.20)	
Target Asset Volatility		1.285*** (3.80)		1.021*** (3.29)		1.002*** (3.34)
Bidder-Target Asset Covariance	-2.004** (-2.44)	-2.010*** (-2.83)	-2.054** (-2.08)	-2.001** (-2.46)	-2.133** (-2.12)	-2.073** (-2.48)
Log(Time-to-Completion (Actual))	0.695*** (5.91)	0.710*** (5.83)	0.626*** (4.34)	0.642*** (4.47)	0.652*** (4.76)	0.666*** (4.83)
Target Termination Provision			2.492*** (5.20)	2.494*** (5.21)	2.536*** (5.29)	2.538*** (5.32)
Collar			-0.592*** (-2.58)	-0.565** (-2.57)	-0.591** (-2.55)	-0.564** (-2.54)
Lockup Option			0.123 (0.61)	0.141 (0.69)	0.0932 (0.46)	0.112 (0.55)
Cash Offer	-0.178 (-0.92)	-0.211 (-1.14)	-0.0899 (-0.38)	-0.108 (-0.47)	-0.0947 (-0.42)	-0.110 (-0.50)
Stock Offer	0.177 (1.56)	0.187* (1.67)	0.367*** (2.88)	0.373*** (2.89)	0.357*** (2.92)	0.363*** (2.92)
Bidder Toehold	-0.556*** (-2.69)	-0.564*** (-2.65)	-0.534** (-2.56)	-0.544** (-2.51)	-0.627*** (-3.50)	-0.635*** (-3.38)
Tender Offer	0.0236 (0.11)	0.0323 (0.15)	-0.131 (-0.56)	-0.124 (-0.52)	-0.113 (-0.49)	-0.107 (-0.45)
Hostile Approach	-1.778*** (-3.68)	-1.792*** (-3.69)	-0.544 (-1.15)	-0.563 (-1.20)	-0.533 (-1.15)	-0.550 (-1.19)
Same Industry	-0.0299 (-0.25)	-0.0169 (-0.15)	-0.0918 (-0.74)	-0.0775 (-0.63)	-0.115 (-0.66)	-0.103 (-0.58)
Log(Target Market Cap.)	0.633*** (6.25)	0.677*** (6.95)	0.613*** (5.28)	0.650*** (5.74)	0.604*** (5.27)	0.641*** (5.75)
Target Market-to-Book Assets	0.0174 (0.45)	-0.0203 (-0.48)	0.00133 (0.03)	-0.0292 (-0.64)	0.00310 (0.07)	-0.0265 (-0.57)
Log(Bidder Market Cap.)	-0.500*** (-5.68)	-0.539*** (-6.18)	-0.511*** (-5.43)	-0.544*** (-5.90)	-0.513*** (-5.10)	-0.544*** (-5.61)
Bidder Market-to-Book Assets	0.0156 (1.25)	0.0281** (2.23)	0.0145 (1.07)	0.0251* (1.89)	0.0159 (1.19)	0.0262** (1.96)
Target Market Cap./Bidder Market Cap.	-0.202 (-1.08)	-0.233 (-1.24)	-0.0275 (-0.12)	-0.0639 (-0.30)	-0.0215 (-0.10)	-0.0561 (-0.26)
Bidder Industry HHI					-0.754 (-0.37)	-0.899 (-0.43)
Same Ind. × Bidder Ind. HHI					0.419 (0.14)	0.443 (0.15)
Financial Buyer					0.946*** (3.01)	0.938*** (2.95)
Bidder Analyst Following					0.00455 (0.51)	0.00376 (0.42)
Bidder Analyst Forecast Precision					-0.00154 (-1.15)	-0.00152 (-1.13)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2078	2078	2078	2078	2078	2078
Pseudo $R^2$	0.142	0.144	0.209	0.210	0.214	0.214

**Table 3:****The Determinants of Bidder Termination Fees**

This table reports estimates from OLS regressions that examine the size of bidder termination fees payable by a bidder upon terminating a takeover agreement. The sample consists of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms, that included a bidder termination provision in the takeover agreement. The dependent variable is the value of the bidder termination fee divided by the total value of the transaction. The explanatory variables are defined in Table B1. Year fixed effects are included. *t*-statistics are computed with standard errors clustered at the bidder's Fama-French 49-industry level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Bidder Termination Fee/Transaction Value					
Constant	0.0432*** (3.37)	0.0482*** (3.47)	0.0248 (1.63)	0.0287 (1.67)	0.0207 (1.38)	0.0254 (1.49)
Bidder Asset Volatility	0.0186*** (3.26)		0.0168*** (3.03)		0.0151*** (3.22)	
Target Asset Volatility		0.00943* (1.85)		0.00799 (1.59)		0.00603 (1.29)
Log(Time-to-Completion (Actual))	0.0109** (2.60)	0.0100** (2.54)	0.00992** (2.15)	0.00900** (2.08)	0.0104** (2.07)	0.00955* (1.99)
Target Termination Fee/Transaction Value			0.298** (2.05)	0.308** (2.11)	0.290* (1.92)	0.300* (1.96)
Collar			-0.00392 (-1.62)	-0.00327 (-1.29)	-0.00457* (-1.87)	-0.00405 (-1.57)
Lockup Option			0.00303 (0.79)	0.00268 (0.67)	0.00265 (0.67)	0.00218 (0.52)
Cash Offer	0.0169*** (3.11)	0.0172*** (3.05)	0.0166*** (2.96)	0.0169*** (2.92)	0.0163*** (3.08)	0.0165*** (3.05)
Stock Offer	0.00427 (1.51)	0.00487* (1.76)	0.00322 (1.17)	0.00378 (1.37)	0.00407 (1.40)	0.00470 (1.59)
Bidder Toehold	0.0458*** (6.38)	0.0459*** (6.20)	0.0269*** (2.83)	0.0262*** (2.71)	0.0296*** (2.92)	0.0294*** (2.90)
Tender Offer	-0.000219 (-0.03)	0.000214 (0.03)	-0.00135 (-0.17)	-0.00104 (-0.13)	-0.000860 (-0.11)	-0.000614 (-0.08)
Hostile Approach	-0.0123 (-1.23)	-0.0127 (-1.25)	-0.0163* (-1.81)	-0.0171* (-1.90)	-0.0144 (-1.50)	-0.0151 (-1.58)
Same Industry	0.0000639 (0.02)	0.000639 (0.19)	-0.000200 (-0.06)	0.000320 (0.10)	-0.00681 (-1.05)	-0.00624 (-0.99)
Log(Target Market Cap.)	-0.00253* (-1.93)	-0.00213 (-1.49)	-0.00162 (-1.08)	-0.00123 (-0.75)	-0.00197 (-1.22)	-0.00164 (-0.93)
Target Market-to-Book Assets	-0.0000683 (-0.16)	-0.000214 (-0.48)	-0.00000353 (-0.01)	-0.000118 (-0.25)	-0.0000331 (-0.08)	-0.0000840 (-0.18)
Log(Bidder Market Cap.)	0.00153 (1.24)	0.000858 (0.70)	0.00127 (0.95)	0.000655 (0.49)	0.00211 (1.47)	0.00145 (1.00)
Bidder Market-to-Book Assets	-0.000261 (-1.06)	0.00000635 (0.03)	-0.000230 (-0.95)	0.0000256 (0.13)	-0.000298 (-0.98)	-0.0000516 (-0.19)
Target Market Cap./Bidder Market Cap.	-0.00220 (-0.52)	-0.00279 (-0.64)	-0.00308 (-0.72)	-0.00364 (-0.82)	-0.00294 (-0.71)	-0.00350 (-0.81)
Bidder Industry HHI					0.00669 (0.14)	0.0159 (0.33)
Same Ind. × Bidder Ind. HHI					0.148 (0.85)	0.148 (0.84)
Financial Buyer					-0.00246 (-0.46)	-0.00281 (-0.54)
Bidder Analyst Following					-0.000236 (-1.39)	-0.000210 (-1.19)
Bidder Analyst Forecast Precision					-0.0000264 (-0.68)	-0.0000249 (-0.63)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	433	433	433	433	433	433
Adjusted $R^2$	0.119	0.108	0.147	0.137	0.155	0.146



**Table 4:**  
Bidder Termination Fees and Target Termination Fees

This table reports estimates from OLS regressions that examine the size of bidder termination fees payable by a bidder upon terminating a takeover agreement. The sample consists of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms, that included a bidder termination provision in the takeover agreement. The dependent variable is the value of the bidder termination fee divided by the total value of the transaction. *Bidder Fee*  $\neq$  *Target Fee* equals 1 if the bidder termination fee equals the target termination fee or if there is a bidder termination provision and no target termination provision, and 0 otherwise. The other explanatory variables are defined in Table B1. Year fixed effects are included. *t*-statistics are computed with standard errors clustered at the bidder's Fama-French 49-industry level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Bidder Termination Fee/Transaction Value					
Constant	0.0448*** (3.91)	0.0502*** (4.42)	0.0253** (2.16)	0.0301** (2.54)	0.0471*** (4.02)	0.0530*** (4.52)
Bidder Asset Volatility	0.00639 (1.28)		0.00558 (1.35)		0.00688 (1.33)	
Target Asset Volatility		0.00192 (0.55)		0.00169 (0.54)		0.00159 (0.43)
Log(Time-to-Completion (Actual))	0.00533** (2.15)	0.00512** (2.10)	0.00425* (1.93)	0.00410* (1.97)	0.00571** (2.18)	0.00539** (2.14)
Bidder Fee $\neq$ Target Fee	0.00979 (0.98)	0.0111 (1.05)	0.00149 (0.12)	0.00297 (0.23)	0.0169 (1.09)	0.0180 (1.14)
Bidder Asset Volatility $\times$ Bidder Fee $\neq$ Target Fee	0.0379*** (2.91)		0.0368** (2.65)		0.0378*** (2.86)	
Target Asset Volatility $\times$ Bidder Fee $\neq$ Target Fee		0.0220* (1.98)		0.0199* (1.70)		0.0227* (1.99)
Log(Time-to-Completion) $\times$ Bidder Fee $\neq$ Target Fee	0.0171* (1.98)	0.0160* (1.99)	0.0167* (1.94)	0.0154* (1.90)	0.0176* (1.97)	0.0167* (2.00)
Target Termination Fee/Transaction Value			0.328** (2.46)	0.330** (2.47)		
Target Fee/Transaction Value $\times$ Bidder Fee $\neq$ Target Fee					-0.111 (-0.76)	-0.111 (-0.74)
Collar			-0.00186 (-0.91)	-0.00173 (-0.75)	-0.00403 (-1.44)	-0.00382 (-1.36)
Lockup Option			0.00282 (0.76)	0.00268 (0.69)	0.00308 (0.83)	0.00291 (0.74)
Cash Offer	0.0156*** (3.01)	0.0160*** (2.87)	0.0154*** (2.75)	0.0158** (2.66)	0.0152*** (2.95)	0.0156*** (2.82)
Stock Offer	0.00558* (1.84)	0.00586* (1.93)	0.00456 (1.52)	0.00481 (1.56)	0.00527* (1.76)	0.00560* (1.88)
Bidder Toehold	0.0493*** (8.85)	0.0485*** (7.83)	0.0290*** (2.93)	0.0282*** (2.75)	0.0498*** (8.92)	0.0489*** (7.85)
Tender Offer	-0.000933 (-0.12)	0.00117 (0.16)	-0.00259 (-0.33)	-0.000595 (-0.08)	0.0000659 (0.01)	0.00218 (0.29)
Hostile Approach	-0.0269** (-2.04)	-0.0273** (-2.24)	-0.0311** (-2.14)	-0.0316** (-2.32)	-0.0246* (-1.94)	-0.0251** (-2.14)
Same Industry	-0.000517 (-0.16)	0.000130 (0.04)	-0.000577 (-0.18)	0.0000444 (0.01)	-0.000533 (-0.17)	0.000136 (0.04)
Log(Target Market Cap.)	-0.00246* (-1.99)	-0.00205 (-1.39)	-0.00136 (-1.00)	-0.000997 (-0.62)	-0.00270** (-2.08)	-0.00227 (-1.48)
Target Market-to-Book Assets	0.0000863 (0.22)	0.0000891 (0.20)	0.0000575 (0.15)	0.0000635 (0.13)	0.000165 (0.41)	0.000184 (0.39)
Log(Bidder Market Cap.)	0.00116 (1.01)	0.000396 (0.31)	0.000873 (0.71)	0.000188 (0.14)	0.00117 (0.98)	0.000369 (0.29)
Bidder Market-to-Book Assets	-0.000280 (-1.00)	-0.000111 (-0.44)	-0.000245 (-0.86)	-0.0000769 (-0.33)	-0.000344 (-1.10)	-0.000164 (-0.58)
Target Market Cap./Bidder Market Cap.	-0.00245 (-0.61)	-0.00304 (-0.73)	-0.00349 (-0.87)	-0.00394 (-0.94)	-0.00231 (-0.55)	-0.00295 (-0.68)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	433	433	433	433	433	433
Adjusted $R^2$	0.181	0.167	0.212	0.198	0.179	0.164

**Table 5:**  
Bidder Termination Provisions and Deal Completion

This table reports estimates from logit regressions that examine the completion of takeovers. The sample consists of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms. The dependent variable equals 1 if the takeover was successfully completed. The explanatory variables are defined in Table B1. Year fixed effects are included. *t*-statistics are computed with standard errors clustered at the bidder's Fama-French 49-industry level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable:	(1) =1 if deal was	(2) Completed
Constant	-0.728 (-1.16)	-1.386** (-2.02)
Bidder Termination Provision	1.098*** (5.55)	0.328 (1.47)
Target Termination Provision		2.260*** (9.54)
Collar		-0.179 (-0.54)
Lockup Option		0.881** (2.07)
Cash Offer	-0.246* (-1.69)	0.00678 (0.05)
Stock Offer	0.0692 (0.32)	0.226 (1.16)
Bidder Toehold	-0.345*** (-5.75)	-0.317*** (-4.04)
Tender Offer	0.721** (2.30)	0.301 (1.01)
Hostile Approach	-3.553*** (-7.05)	-2.581*** (-5.79)
Same Industry	-0.0867 (-0.42)	-0.180 (-0.79)
Log(Target Market Cap.)	-0.417*** (-4.07)	-0.461*** (-4.41)
Target Market-to-Book Assets	-0.0948** (-2.33)	-0.129*** (-3.20)
Log(Bidder Market Cap.)	0.604*** (5.71)	0.605*** (4.71)
Bidder Market-to-Book Assets	-0.00584 (-0.31)	-0.0186 (-1.07)
Target Market Cap./Bidder Market Cap.	-0.0653 (-0.36)	0.111 (0.45)
Year Fixed Effects	Yes	Yes
Observations	2078	2078
Pseudo $R^2$	0.198	0.297

**Table 6:**  
Bidder Termination Provisions and Wealth Gains from Takeovers

This table reports estimates from OLS regressions that examine the offer premiums and wealth gains in takeovers. The sample consists of takeovers announced between 1997 and 2013 involving bidders and targets that were both publicly listed U.S. firms. The dependent variable is the combined gain of the bidder and target around the takeover announcement which is computed as the sum of the bidder and target's 3-day cumulative dollar abnormal returns around the takeover announcement divided by the sum of the bidder's and target's market capitalizations 50 trading days before the takeover announcement. *Bidder Fee*  $\neq$  *Target Fee* equals 1 if both a bidder and target termination provision are included with the bidder termination fee not equal to the target termination fee or if there is a bidder termination provision and no target termination provision, and equals 0 otherwise. *Bidder Fee* = *Target Fee* equals 1 if both a bidder and target termination provision are included with the bidder termination fee equal to the target termination fee, and equals 0 otherwise. The other explanatory variables are defined in Table B1. Year fixed effects are included. *t*-statistics are computed with standard errors clustered at the bidder's Fama-French 49-industry level. \*, \*\*, and \*\*\* indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable:	(1)	(2)	(3)	(4)
	Combined Gain			
Constant	0.0639*** (5.32)	0.0639*** (5.25)	0.0650*** (5.47)	0.0645*** (5.30)
Bidder Termination Provision (BTP)	0.00348 (1.06)	0.00437 (1.34)		
BTP with Bidder Fee $\neq$ Target Fee			0.0176*** (5.05)	0.0180*** (5.19)
BTP with Bidder Fee = Target Fee			-0.00439 (-0.94)	-0.00360 (-0.76)
Target Termination Provision		-0.00208 (-0.52)		-0.00109 (-0.27)
Collar		0.00787 (1.42)		0.00754 (1.34)
Lockup Option		0.00606 (1.13)		0.00581 (1.09)
Cash Offer	0.0141*** (4.08)	0.0150*** (4.39)	0.0141*** (4.08)	0.0151*** (4.40)
Stock Offer	-0.0137*** (-3.20)	-0.0149*** (-3.22)	-0.0133*** (-3.23)	-0.0143*** (-3.21)
Bidder Toehold	0.00164 (0.96)	0.00167 (0.97)	0.00168 (0.99)	0.00173 (1.00)
Tender Offer	0.00507 (1.49)	0.00552 (1.50)	0.00485 (1.40)	0.00515 (1.39)
Hostile Approach	0.0000384 (0.00)	-0.00102 (-0.10)	-0.000729 (-0.09)	-0.00121 (-0.12)
Same Industry	-0.00126 (-0.48)	-0.000873 (-0.33)	-0.00128 (-0.50)	-0.000958 (-0.38)
Log(Target Market Cap.)	0.000854 (0.55)	0.000781 (0.49)	0.000925 (0.59)	0.000846 (0.52)
Target Market-to-Book Assets	-0.000918 (-1.17)	-0.000832 (-1.13)	-0.000835 (-1.03)	-0.000760 (-0.99)
Target Debt/Assets	0.000886 (0.12)	0.00113 (0.15)	0.000588 (0.08)	0.000803 (0.11)
Log(Bidder Market Cap.)	-0.00414** (-2.47)	-0.00418** (-2.52)	-0.00429** (-2.54)	-0.00433** (-2.60)
Bidder Market-to-Book Assets	-0.0000192 (-0.06)	-0.0000397 (-0.13)	-0.0000146 (-0.05)	-0.0000398 (-0.13)
Bidder Debt/Assets	0.0109 (1.33)	0.0116 (1.41)	0.0112 (1.42)	0.0119 (1.48)
Target Market Cap./Bidder Market Cap.	0.00770 (1.53)	0.00778 (1.52)	0.00797 (1.57)	0.00812 (1.57)
Year Fixed Effects	Yes	Yes	Yes	Yes
Observations	2078	2078	2078	2078
Adjusted $R^2$	0.065	0.066	0.071	0.072