Influencing Control: Jawboning in Risk Arbitrage*

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Abstract

This is the first study on a relatively new phenomenon of "activist risk arbitrage," in which some shareholders attempt to change the course of an announced M&A deal through public campaigns and appraisal appeals in order to profit from improved terms for either target or acquirer shareholders. Compared to conventional (passive) risk arbitrageurs, activist arbitrageurs are more likely to select deals that are susceptible to managerial conflicts of interest, including going-private deals, "friendly" deals, and deals with lower announcement premiums. While activist risk arbitrage does not significantly change the probability of deal completion, it increases the sensitivity of deal completion to market price signals. Finally, activist risk arbitrage yields significantly higher returns than passive arbitrage, with little incremental deal risk.

Key Words: Activist Risk Arbitrage; M&A; Appraisal Arbitrage.

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1 Introduction

In December 2012, Plains Exploration & Production (NYSE ticker: PXP), a petroleum company based in Houston, was preparing to be acquired by Freeport-McMoRan (NYSE ticker: FCX), a natural resources company based in Phoenix. At the offer price of $45.96 (a combination of $25 cash and 0.6531 FCX shares), the existing shareholders stood to gain a premium of 26.2% over the pre-announcement price. The special meeting to vote on the merger was scheduled for May 20, 2013. Then on May 6, 2013, CR Intrinsic Investors, a subsidiary of SAC Capital Advisors and a 3.8% owner of PXP, sent a public letter to the board announcing its intent to vote against the deal and to persuade other shareholders to do the same. The letter stated that CR Intrinsic valued PXP at $49.56 based on the strong results of the company and the industry following the merger agreement.

By then a "wolf pack" appeared to have been formed. On the same day, Arrowgrass Capital Partners, a hedge fund based in London and New York, announced a 3.7% stake and denounced the proposed merger. Another hedge fund manager, John Paulson, was the largest outside shareholder (9.9%) at the time but did not express his voting preference. The dissidents quickly secured support from the two leading proxy advisors, Institutional Shareholder Services ("ISS") and Glass Lewis, both of which on the next day recommended voting against the transaction. On May 20, FCX allowed PXP to declare a special one-time dividend of $3/share prior to the merger consummation, and promised supplemental dividends post-merger. Paulson immediately pledged his shares in favor of the deal, and the merger proposal passed in the meeting held later that day. The stock closed at $48.99, a 38.2% premium over the pre-announcement price. During the same period, the S&P 500 appreciated 16.8% and the energy sector index (NYSE: VDE) rose 14.2%.

The story is reminiscent of an "M&A arbitrage" or "risk arbitrage" strategy by speculators, but carries features that are distinct from the conventional risk arbitrage analyzed

in the literature.[1] In conventional, or "passive," risk arbitrage, a speculator takes a long position in the target company (the speculator may also take a simultaneous short position in the acquirer in stock deals) right after the announcement of an acquisition—this was the strategy employed by CR Intrinsic. Although the stock price generally increases after the announcement, it will likely remain below the final purchase price due to the risk that the deal may fail. The passive arbitrageur then votes its shares in favor of the merger and hopes to profit from full price convergence at deal consummation. During the process the speculator does not "voice" its opinion other than voting its shares. In fact, the passive arbitrageur avoids engaging the management so as not to compromise its freedom to trade under insider trading rules—here CR Intrinsic diverged from the typical route of risk arbitrage.

Instead, CR Intrinsic loudly voiced its opinion that the target deserved a higher bid, and threatened to block the deal via both its own voting rights and, more importantly, its influence on other shareholders. If it had adopted a passive risk arbitrage strategy, CR Intrinsic would have earned a return of 3.3% from its long position (from right after the initial merger announcement to the final tendering of the stock at $45.96). However, with its activist risk arbitrage strategy, CR Intrinsic pocketed a much higher return of 10.1%. The incremental costs were the time/effort spent in jawboning, in writing and disseminating the public letter, and perhaps a higher risk that the deal will completely fall through, after which the price could go back to the pre-announcement level.

The CR Intrinsic/PXP case is by no means an exception. Such activist arbitrage activities have been on the rise: they were observed in 0.6% of all M&A deals in 2000, compared to 13% of all such deals in 2013. However, the academic literature has not formally analyzed the full process, characteristics, or the impact of activist risk arbitrage on the market for corporate control. Our study fills the gap. As shareholder activism launched by institutional

[1]The representative work in the area includes theory work by Cornelli and Li (2002) and Gomes (2012), and empirical studies by Baker and Savasoglu (2002), Mitchell, Pulvino, and Stafford (2004) and Hsieh and Walkling (2005).

investors becomes an increasingly more common form of corporate governance,[2] its blend with a popular, traditionally non-activist, arbitrage strategy is instructive. A signature of institutional investor activism has been that it strives to influence corporate policies and governance, but does not aim for control (Brav, Jiang, Partnoy, and Thomas, 2008a). The activist arbitrage strategy, by instilling shareholder activism into corporate control events, thus bridges the two by "influencing control."

Our study builds on three disjoint subsamples covering all M&A deals between 2000 and 2013. The most important of the three is the "event sample:" a manually composed sample of 335 activist risk arbitrage events where there was observed jawboning by outside blockholders after the initial announcement of an acquisition. Next in importance to the event sample is the "conditional control sample," which consists of 2,681 disclosed passive risk arbitrage events. The final subsample is the "unconditional control sample," which is the complement set left over from all the 3,464 M&A deals during the period. Both control samples are constructed following the standard procedure used in the M&A and the (passive) risk arbitrage literature.

Our analyses reveal similarities as well as dissimilarities between the two forms of risk arbitrage strategies. On the one hand, both types prefer larger deals and target companies with higher institutional ownership; and they both adopt a similar "toehold" strategy. On the other hand, the most striking dissimilarity is that activist arbitrageurs are more likely to attack going-private deals, in which the acquirers are often the managers themselves ("MBOs") and/or financial acquirers (such as private equity firms). In comparison, the acquirers in non-going private M&A deals are more likely to be other companies strategically aiming for synergies or better market positioning. Second, the best predictor for an arbitrageur to be an activist rather than remaining passive is a relatively low announcement premium. Third, activists are more likely to disturb otherwise "friendly" deals. Presumably

[2]Please see Gillan and Starks (2007) for a survey on general shareholder activism, and Brav, Jiang, and Kim (2010) for a survey on hedge fund activism.

in those deals, the board and the management, by endorsing the deals with favored acquirers, may not have done their due diligence to challenge the acquirers for better terms or to solicit competing bids. These results suggest that activist risk arbitrage is potentially an important form of governance in guarding investors' interests during corporate control changes that are susceptible to management self-dealing or other forms of managerial conflict of interest.

As expected, activist arbitrageurs earn much higher average returns than passive ones, compensating for the "jaw pain" as well as for the assumption of higher risks—both legal and deal risks. Baker and Savasoglu (2002) document an annualized return of 7-11% for passive risk arbitrageurs, and this number is reduced to 5-6% in our more recent sample. The average return accrued to activist arbitrageurs is 14% from post-deal announcement to resolution. To the extent that any abnormal return in trading has to come from some form of "private information," the return spread between the activist and passive strategies is not surprising. In Cornelli and Li's (2002) model, a passive risk arbitrageur "creates" private information after purchasing shares because he is now privately informed about his own intended vote, which in turn increases the value of the shares by raising the probability of a favorable vote outcome and therefore the probability of deal completion.[3] Applying the same framework to an activist risk arbitrageur, her information advantage becomes greater because she is privately informed about her intention (and her confidence in her own ability) to push up the price of the target stock, hence there is more room for the return spread.[4]

By blocking an announced deal in order to extract a higher price, the activist arbitrageurs potentially assume more deal failure risk than the passive arbitrageurs who vote their shares in favor of the deal. It is thus important to assess the risk side. We find no evidence that

[3]Note that even passive risk arbitrage contains an activist element in that the arbitrageur's action potentially affects the terminal value of the security being arbitraged, as opposed to a "pure trading" arbitrage strategy where the security value is exogenous and arbitrageurs merely profit from a convergence of price to the value. For a more detailed discussion, please see Bradley, Brav, Goldstein, and Jiang (2010).

[4]In Gomes' (2012) model, the passive arbitrageurs may also collectively push up the bids in a minority freeze-out because the acquirers set a high preemptive bid to counter the hold-out by the arbitrageurs. In this setting, the higher bid price arises in equilibrium with mutually consistent beliefs, rather than through influence and persuasion as in an activist arbitrage.

activists select deals with a higher ex-ante completion probability. However, they increase the sensitivity of deal completion to the ex-ante completion probability. On the other hand, activist arbitrage is associated with only a small and insignificant drop in the overall deal completion rate. Relatedly, a hazard analysis indicates that activists do not noticeably slow down the process toward deal completion. Therefore, activist arbitrageurs are not only sophisticated in picking deals for which there is more room for improvement, but they also increase the completion rate of deals that are welcomed by the market (as reflected in the ex-ante deal completion rates). The two sides constitute a sustainable equilibrium in which activists do well for themselves while doing good for the investing public, echoing the findings of Brav, Jiang, Partnoy, and Thomas (2008b).

2 Data Sources, Sample Construction, and Sample Overview

2.1 Sample of mergers and acquisitions

Our sample of mergers and acquisitions ("M&As"), announced between January 1, 2000 and December 31, 2013, is constructed using information from the Securities Data Company ("SDC") database. We include all attempted acquisitions, regardless of whether they are consummated or not. We apply the following filters commonly used in the prior M&As literature (Hsieh and Walkling, 2005; Gaspar, Massa, and Matos, 2005; Baker and Savasoglu, 2002): (1) The target company must be covered by CRSP before deal announcement. (2) The acquirer must own less than 50% of the target's stock before the acquisition, and must own more than 50% after the acquisition. (3) Each deal must be classified as a stock, cash or hybrid (part stock and part cash) deal.[5] As SDC's definition of payment form is different

[5]Like Gaspar, Massa, and Matos (2005) and Dai, Massoud, Nandy, and Saunders (2013), we include hybrid deals in our sample, while Hsieh and Walkling (2005) and Baker and Savasoglu (2002) exclude such

from merger agreements for certain deals, especially those labeled by SDC as "Unknown" and "Other," we manually collect the form of payment for all sample deals from merger agreements and 8-Ks filed with the SEC. For stock transactions involving floating-exchange ratios and collars,[6] we gather information about the terms of the transaction and key dates from the same SEC filings. (4) The transaction must not be classified by SDC as a divestiture, spin-off or repurchase.

Finally, we verify in Factiva all mergers with deal status labeled as "Pending." If the deal has since been consummated or withdrawn, we change its status accordingly. We then drop deals with a "Pending" status as of August 2014. These criteria result in a sample of 4,093 deals. Data on the deal announcement date, effective date, withdrawal date, deal premium, and characteristics of the target and acquirer are collected from the SDC. Institutional holdings data are from the Thomson Financial 13F Database, and firm characteristics and stock prices/returns are from Compustat and CRSP, respectively.

2.2 Sample of activist risk arbitrage

2.2.1 Sample construction

Activist risk arbitrage is a relatively new phenomenon without an official definition. Loosely speaking, such arbitrage could be any attempt by shareholders to profit from an announced merger and acquisition deal by exercising shareholder rights beyond voting, and therefore could take a variety of forms. We group all such activities into three basic categories and construct the samples accordingly: (1) Activist risk arbitrage in targets; (2) appraisal arbitrage; and (3) activist risk arbitrage in acquirers. There are 359 cases in all.

deals.

[6] A collar agreement can be viewed as a combination of stock and cash offers; it mitigates the impact of uncertainty about the buyer's share price through either a transfer of cash or an adjustment in the exchange ratio. See Fuller (2003) and Officer (2004) for a more detailed description of collar offers.

1. *Activist risk arbitrage in targets ("Target arbitrage")*

This is the most important category and account for 75.8% of our sample of activist arbitrage events. The case outlined in the Introduction belongs to this group. A defining feature of all the cases in this category is that the arbitrageurs, who hold sizable equity stakes in the target companies of announced M&A deals, launch public campaigns (ranging from shareholder proposals to proxy contests) in order to block the deal under the current terms; and in most cases, to extract better terms from the acquirers for target shareholders. A successful target arbitrage presumably benefits all shareholders of the targets. Figure 1 illustrates the typical path of a target arbitrage, juxtaposed with that of a conventional passive arbitrage, from the announcement of the M&A deal to its resolution.

[Insert Figure 1 here.]

The primary data source to identify all such events is SharkRepellent – a data provider that specializes in corporate governance – which identifies 272 merger targets with activist campaigns (335 deal-activist pairs, as 45 deals involved multiple activists' participation) during the period from 2000 to 2013. For each target firm, we identify the activist arbitrageurs as the institutional investors who publicly criticized the transaction or solicited proxies against the deal. We then manually collect activist arbitrageurs' plans and actions through their press releases (letters to boards/management) and Schedule 13D filings if these investors acquired more than 5% of a publicly traded target company. Such information includes the ownership stake, announcement date (press release or Schedule 13D filing date), and withdrawal date if the campaign was unsuccessful.

Several additional steps ensure sample completeness. In the first step, we manually collect all Schedule 13D filings between deal announcement and resolution for all mergers announced between 2000 and 2013. The filing entity is regarded as an activist arbitrageur if it satisfies either of the following two criteria: (1) It states under Item 4 that the purpose

of the investment was to object to the current structure of the acquisition, or to propose different terms for the deal.[7] (2) The results of our extensive news searches in Factiva yield press releases (letters to boards/management) indicating that the activist expressed concerns about an announced deal and objected to the acquisition under the current contract terms.

The first step yields 19 cases where the arbitrageurs held more than a 5% stake in the target company (due to the requirement of Schedule 13D filings). In the second step, the news searches only uncover an additional 5 target firms involving activist arbitrageurs with sub-5% holdings.

2. *Appraisal arbitrage*

In a related popular strategy, activist arbitrageurs purchase stocks in a merger target in order to exercise their appraisal rights, which allows dissenting shareholders to seek value they deem "fair" rather than to accept the merger consideration. Appendix A presents an example. To adopt this strategy, dissenting shareholders must vote against the merger or withhold their shares from tendering, before asking a court to determine the fair value of their stocks. The majority of the appraisal litigations are filed in the Delaware Court of Chancery.[8] From the 2,454 Opinions and Orders issued by the Delaware Court of Chancery between 2000 and 2013, we collect all appraisal petitions against public companies, including information on dissenters and their holdings in the merger target, as well as the "fair" tender price granted by a judge. This procedure yields 23 unique merger targets involving activist arbitrageurs that are not already included in the "target arbitrage" database.

Appraisal arbitrage is one form of activist arbitrage in target companies in announced

[7]It is worth noting that passive risk arbitrageurs who are 5% or more beneficial owners of the target company must also complete a Schedule 13D filing. However, for the arbitrageur to be considered "passive" in our analysis, Item 4 of the filing should not contain language that challenges the announced deal; nor should the filer issue any public letter commenting on or criticizing the deal.

[8]Appraisal actions outside of Delaware are likely to be quite rare. According to an opinion expressed by Kirkland & Ellis, a leading M&A law firm in March 2015, courts have little or no experience deciding appraisal actions, particularly in the public company context, outside Delaware. See http://corpgov.law.harvard.edu/2015/03/25/crossing-state-lines-again-appraisal-rights-outside-of-delaware/.

M&A deals. And often times it represents the arbitrageur's "last resort" after he failed to convince the majority shareholders to block the deal. We separate this category from the "target arbitrage" category because the two differ along two important dimensions. First, a successful activist arbitrage in a merger target benefits all shareholders by sweetening the terms for all. In contrast, the gain from a successful appraisal arbitrage accrues only to the dissenters who withheld their shares in voting and who did not receive the sales proceeds. The value premium won from an appraisal is paid to the petitioners only, and is not shared by other shareholders. Second, the first type of activist arbitrage necessarily entails public campaigns while the same is not necessarily true (though it is still usually the case) for appraisals, precisely because the tactic does not rely on support from fellow shareholders.[9]

3. *Activist risk arbitrage in acquirers ("Acquirer arbitrage")*

Following the same procedure as that outlined in the "target arbitrage" section, we further identify 40 acquirers targeted by activist arbitrageurs during the same period. Appendix B presents an example. In most cases, the activists deem the announced deal as overpaying or as deficient in due diligence, and strive to block the deal altogether (if it is deemed value destroying) or to modify the terms in favor of the acquirer. In contrast to passive arbitrageurs who short the acquirer, activist arbitrageurs in these cases long the acquirer and hope to profit from value improvement rather than from spread convergence.

To summarize, all three categories of events are about "negative" risk arbitrage in which the arbitrageur campaigns against the deal in its current form. A comprehensive search of Schedule 13D filings and news stories using Factiva would also yield cases for "affirmative" risk arbitrage in which investors buy shares in order to vote in favor of the deal, and

[9]In most cases an appraisal arbitrageur would still publicize their endeavor so as to pressure the acquirer to sweeten the deal; or to influence the public perception about the "fair" value. For example, three hedge funds Merion Capital, Brigade Capital, and Muirfield Capital challenged the valuation of $34.92 per share offered in the private buyout of Safeway in 2015. Their public campaign led to a settlement on June 1, 2015, in which the acquirer paid a 26% premium to Merion, while the other two hedge funds proceeded to the court in expectation that the settlement set a higher base for the appraisal.

sometimes may even publicly promote the deal in order to influence other shareholders. We exclude such events from our sample of activist arbitrageurs. In fact, our sample of passive risk arbitrageurs (to be described in Section 2.3) includes some of these "positive" arbitrage events.

Naturally, analyses of activist arbitrage on the target side and that on the acquirer side require different data inputs and addresses different research questions. Most of our empirical analyses focus on the target side, with the exception of Section 6 which provides a brief description of activism on the acquirer side.

2.2.2 Sample overview

1. *Activities and players*

Figure 2 plots the frequency of merger transactions and activist arbitrageur activities over our sample period. Activist arbitrage activity is generally correlated with M&A volumes, reaching its peak in 2007, before dropping significantly during the financial crisis and then resuming in recent years.

[Insert Figure 2 here.]

Further, Table 1 lists the top players in our sample that invested in at least four merger transactions. The top four are GAMCO Investors, Inc., Ramius LLC, Carl C. Icahn, and Elliott Associates, LP, and combined they account for 12.4% of all the deals.

[Insert Table 1 here.]

2. *Ownership and investment horizon*

In Table 2, we report the size of activist arbitrageurs' stakes in merger targets at disclosure, both in dollar value and as a percentage of outstanding shares. The median initial (maximum) percentage stake that activist arbitrageurs take in the merger target is 7.1%

(8.2%), and the median dollar investment is $22.0 ($25.5) million.[10] The level of ownership is comparable to the full sample of hedge fund activism reported in Brav, Jiang, Partnoy, and Thomas (2008). As activist arbitrageurs in general do not hold controlling blocks, they implement changes in a deal via influence on the board or fellow shareholders. The "influence" based tactics, from public campaigns to proxy solicitation, are thus necessitated by the gap between the typical ownership of activists and the votes required to block an existing deal or to pass a revised deal. Almost all (205 out of the 210) merger targets required the approval of a majority of shares outstanding (seven such deals require the approval of a two-thirds supermajority). The remaining five deals require the approval of a majority of shares voted (counting abstention shares). Given that the average (median) approval rate in our sample is 69.1% (72.2%), the votes directly commanded by the activist arbitrageurs' are unlikely to be pivotal. Hence persuasion to win fellow shareholder support is crucial.

[Insert Table 2 here.]

Regarding activist arbitrageurs' investment horizons, Table 2 shows that the median duration between deal announcement and initial disclosure of activist arbitrageur holdings is 15 trading days, with an interquartile range of 5 to 40 days, indicating that the risk arbitrageurs are swift in establishing toeholds right after announcement. Such quick action is made possible by being part of a massive share turnover among a diverse shareholder clientele during the period. Jetley and Ji (2010) find that trading volume in target stocks subsequent to merger announcements is more than ten times higher than normal levels. The median duration between initial disclosure of holding and deal resolution is 60 trading days, affording activist arbitrageurs plenty of time to influence completion as well as the terms of the merger.

[10]The "Initial" columns show the stakes that the activist arbitrageur holds in a merger target when it initially discloses its positions through a Schedule 13D filing or a press release. The "Maximum" columns report the maximum stakes activist arbitrageurs hold in a merger target, which are retrieved from subsequent new disclosures by other activist arbitrageurs as well as amendments to the initial disclosure.

3. *Activist arbitrage tactics*

Activist arbitrageurs use a variety of tactics to oppose an announced deal under the stated terms. The most common ones include: (1) Public criticism of the transaction through letters addressed to the target's board and/or shareholders, usually accompanied by press releases (138 cases). The same letters are often attached to Schedule 13D filings under Item 4 (151 cases). (2) Proxy solicitation intended to veto the deal (45 cases, 19 of which involve proxy contests). (3) Proposing alternative acquisitions (10 cases). (4) Lobbying proxy advisory firms like ISS in order to influence their institutional shareholder clients. For our sample transactions, ISS issued 93 voting recommendations with an overall support rate of 72.0%. This implies that ISS supported the dissidents 28.0% of the times. Excluding appraisal petitions, the support rate for dissidents increased to 36.7%. (5) Exercising appraisal rights (22 cases), where arbitrageurs receive a court-issued new valuation of the target shares after voting against (but failing to block) the deal.

Activist arbitrageurs' tactics have proven to be successful overall, often accomplishing their goals before even reaching the final vote. Facing the threat that a deal may not receive shareholder approval, a board becomes incentivized to negotiate more favorable terms even after it has already singed a definitive merger agreement due to the reluctance of the board to withdraw its recommendation for the deal (Hotchkiss, Qian, Song, and Zhu, 2013). In our sample, activists contribute to sweetening of deal terms from acquirers in 56 transactions, leading the target board to accept a higher bid in 16 cases and acquirers to withdraw bids in 26 cases. Indeed, only 8 transactions are blocked in the actual voting stage. The remaining 104 deals are approved under the original terms. The success rate of 50.5% is on par with that reported in Becht, Franks, Grant and Wagner (2015) based on a recent broad sample of hedge fund activism.

2.3 Sample of passive risk arbitrageurs

Passive risk arbitrageurs are investors who purchase stocks after an acquisition announcement for the purpose of voting on the deal, but do not openly criticize or campaign against the deal or attempt to change its major terms. Estimates of (passive) arbitrage funds' ownership of the target's shares subsequent to the merger announcement range from 15% during 1992-1999 (Hsieh and Walkling, 2005) to 35% during 1985-2004 (Officer 2007). To identify passive arbitrageurs, we follow the methodology developed by Hsieh and Walkling (2005) using the Thomson Reuters institutional 13F ownership information, and illustrate the process in Figure 3.

[Insert Figure 3 here.]

First, we require that a deal span at least two quarters. That is, the deal announcement and resolution cannot fall into the same quarter. This step eliminates 629 deals, and our sample is reduced to 3,464 deals. The purpose of this step is to make sure that we can calculate the change in institutional ownership around the deal announcement. Second, we require that the arbitrageur have a positive change in stock ownership for at least 6 deals and in more than 60% of all deals in which it has disclosed holdings between the end of Quarter t-1 and the end of Quarter t—presumably during which the deal is announced. Institutional investors meeting these criteria are classified as passive risk arbitrageurs in those deals. Though the two numerical cutoffs are arbitrary, robustness checks ensure that our main results are not affected by the specific choices within a reasonable range.

The above steps identify 3,714 unique passive risk arbitrageurs between 2000 and 2013. We then proceed to identify deals that involve passive arbitrageurs but lack participation by any of the activist arbitrageurs in our sample. The double criteria yield 2,461 deals. In addition to identifying passive risk arbitrageurs through 13F filings, we supplement the search by processing all schedule 13D filings between announcement and resolution for all

deals between 2000 and 2013. The filer is considered a passive arbitrageur if it meets two criteria: First, the filing investor does not state under the Item 4 of Schedule 13D a purpose to influence the pending merger beyond the entitled voting rights; second, there is no trace in the public news archive indicating the opposite. This procedure yields an additional 220 unique passive risk arbitrageurs.

After merging our M&A database with the samples of risk arbitrageurs, we end up with 210 deals targeted by activist arbitrageurs, 2,681 deals involving passive arbitrageurs (but not activists), and 573 deals with no disclosed arbitrageurs. Of the total of 3,464 mergers, 2,089 are cash offers, 749 are stock deals, and the rest are a mixture of the two.

3 Deal Selection by Activist Arbitrageurs

3.1 Comparing activist arbitrage with the control samples

We start by examining the characteristics of merger targets that are more likely to attract activist arbitrageurs. The first column of Table 3 reports characteristics of merger targets held by activist arbitrageurs, and the next two columns compare these merger targets with those held by passive-only arbitrageurs, the traditional risk arbitrageurs documented in the prior literature (e.g., Hsieh and Walkling, 2005; Mitchell, Pulvino and Stafford, 2004), and targets in deals involving no disclosed arbitrageurs.

[Insert Table 3 here.]

Deals held by activist arbitrageurs on average have an announcement premium of 19.1%, as compared to a 32.2% premium for deals involving passive arbitrageurs (t-statistic for the difference equals -7.5), and a 39.3% premium for those without disclosed arbitrageurs (t-statistic for the difference equals -7.6). As the announcement premium is a common proxy for how much the offer price exceeds the merger target's closing stock price one day prior to

the announcement, the significant difference indicates that activist arbitrageurs are "bargain hunters:" They tend to target deals with lower announcement premiums, which have more room to increase the bid. Activist arbitrageurs also are more likely to invest in going-private deals, many of which are management-led buyouts and cash deals. These financial buyers tend to initiate lower bids than strategic or corporate buyers, whose higher offer prices can be justified by potential synergies created in the merger (e.g., Bargeron, Schlingemann, Stulz and Zutter, 2008).

Compared to deals involving passive arbitrageurs, deals held by activist arbitrageurs are 16.6 percentage points more likely to involve multiple bidders (t-statistic for the difference equals 5.5), many of which are approached by the target board at the pressure from these activists. In fact, out of the 52 multiple-bidder deals held by activist arbitrageurs, 67.3% of them engaged new bidders only *after* these arbitrageurs initiated their proposals. Deals involving activist arbitrageurs are less likely to have defensive tactics, such as a shareholder rights plan, against takeovers. This makes hostile takeovers more likely to succeed as a last resort, potentially increasing arbitrageurs' profits.

Activist arbitrageurs tend to target deals with higher institutional holdings, compared to deals involving passive arbitrageurs or those without disclosed arbitrageurs, consistent with a key finding of Bradley, Brav, Goldstein, and Jiang (2010), who analyze activists' endeavor in opening up closed-end funds. Institutional ownership indicates the sophistication of the shareholder base. As minority stockholders, activist arbitrageurs need the support of other institutional investors in order to achieve their agenda.

Indeed, deals involving activist arbitrageurs on average have a higher revision return, which is the increase in the acquirer's bid scaled by the share price right before the initial takeover announcement. The fact that passive arbitrage is not associated with a positive premium revision (confirming the same finding in Hsieh and Walkling (2005)) reflects the defining property of passive arbitrage. In this context, activist arbitrageurs achieve a positive

outcome for shareholders that passive arbitrageurs do not. Activists usually pressure the boards of merger targets to reject the initial offer or to seek an alternative bid, often resulting in a higher offer price, either from the original bidder or a third-party acquirer.

3.2 Determinants of Activist Arbitrageurs' Participation

The comparison of summary statistics discussed in the previous section serves as a diagnostic test for the determinants of activist arbitrage among all M&A deals. In this subsection, we resort to formal tests that control for all determinants, valued at the initiation of the events, using two statistical methods. Unconditionally, we use an unordered choice model (multinomial logit model) to analyze why investors engage in activist arbitrage, assuming that they can choose to be an activist arbitrageur, to be a passive arbitrageur, or not to participate in any capacity. In this analysis, the choice among the three options is mutually exclusive, reflecting the "competing risk" nature of the decision, but is not ordered. Conditional on their decision to engage in risk arbitrage, we use a probit model to study why investors voice concerns about the deal at a given target firm, as opposed to remaining mere passive investors who take no action other than voting their shares.

3.2.1 Unconditional analysis: Unordered choices among activist arbitrage, passive arbitrage, and no arbitrage

Panel A of Table 4 reports results from fitting an unordered choice model using the multinomial logit regression method. The state of "no arbitrage" serves as the base outcome. Columns (1) and (2) display the coefficients (and the associated marginal probability) representing the marginal effect of each of the regressors on the likelihood of activist and passive arbitrage relative to the base outcome. The set of the regressors are the same as those in Table 3 with the critical difference that all variables in the regressions are measured at the time of deal announcement.

[Insert Table 4 here.]

Most importantly, and consistent with results in Table 3, *Announcement premium* has a significant (at the 1% level) impact on the likelihood of ownership by activist arbitrageurs. A one-standard deviation increase in the announcement premium is associated with a decrease in the marginal probability of 5.5%. Relative to the unconditional probability for the presence of activist arbitrageurs, 6.1%, the incremental probability is remarkable. Such a relation indicates that activist arbitrageurs seek to identify deals with low announcement premiums, which have a high potential for increased bids, especially when the low premium is associated with potential conflicts of interest. In fact, the arbitrageurs' stated goals in their 13D filings or news releases are consistent with this finding: key phrases like "substantially undervalued" and "inadequate" are common in their statements.

The coefficients associated with two more deal characteristics support the conflict of interest hypothesis. Activist arbitrageurs are 4.8 percentage points more likely to emerge in *Going-private* deals (26.6% of all transactions), usually financed by financial, rather than strategic, sponsors; and 3.3 percentage points more likely to intervene in a *friendly* deal (94.8% of all transactions). Both effects are significant at the 1% level. In a regression framework, such effects are net of that of the offered premium, that is, the analysis already takes into account that financial and/or friendly buyers typically offer lower bids than strategic buyers. In particular, going-private deals are among the most prone to conflicts of interest, especially when a controlling shareholder is a member of the buyer group because the controlling stockholder's ownership interest gives it the power to effectively control the approval of the transaction (and to veto any alternative transaction), while minority or unaffiliated stockholders are susceptible to potential coercion and other manipulative tactics. A similar argument applies, to a lesser degree, to "friendly" deals, where the board endorses the proposed transaction. Both significant and positive coefficients thus exemplify the corporate governance element in the activist arbitrageur strategy.

Furthermore, the coefficient for *Institutional ownership* suggests that the merger target's shareholder clientele has a significant impact on the likelihood of activist arbitrageurs' involvement. A one-standard deviation increase in institutional holdings is associated with an increase in the marginal probability of 1.6% (significant at the 1% level). Given their minority stakes in merger targets and the typical "apathy" of retail and small investors (Black, 1990), it is crucial for activists to rely on the support of these institutional investors in order to have their strategies implemented.

Both *Deal value* and *Acquirer toehold* also positively predict the presence of activist arbitrageurs, and the coefficients are statistically significant at the 1% level. However, the economic magnitude of both marginal probabilities is modest. The effect of acquirer toeholds is consistent with Betton and Eckbo's (2000) finding that higher toeholds are associated with lower offered premiums, which, in our context, implies a higher probability of being targeted by activists. The remaining independent variables, including *ROA*, *Stock deal*, *Defense*, and *Tender offer*, are not significant predictors for the emergence of activist arbitrage.

Column (2) of Panel A, Table 4 reports the determinants of passive arbitrage, as "competing risk" to activist arbitrage, relative to the base state of target firms involving no disclosed arbitrageurs. Results indicate that deals attracting passive-only arbitrageurs tend to be bigger, with a larger institutional investor base, endorsed by the board, and entail a larger toehold by the acquirers. All these coefficient estimates are significantly and positively associated with deal completion—hence a passive arbitrage strategy is likely to accomplish spread convergence with little deal risk.

Interestingly, there appears to be little relationship between announcement premium and the relative probability of a deal being targeted by passive arbitrageurs, consistent with the arbitrageurs' focus on deal completion rather than improvement. However, by regressing the post-announcement return (the abnormal return accrued between deal announcement and resolution) on a dummy indicating whether or not a deal involves passive arbitrageurs,

controlling for the same covariates as those in Table 4 (not tabulated), we find that passive arbitrageurs enjoy a post-announcement return that is 5.2 percentage points higher than that for non-arbitrageurs (significant at the 10% level). This supports Cornelli and Li's (2002) theoretical prediction that the passive arbitrageurs' toeholds and voting intentions create a form of private information, which earns abnormal return in equilibrium. This return premium is also consistent with Hsieh and Walkling (2005), who find a positive association between the aggregate change in passive arbitrage holdings and post-announcement returns.

3.2.2 Conditional analysis: Probit regression conditional on arbitrageurs' participation

The conditional analysis assesses the determinants of activism conditional on the participation of risk arbitrageurs. Panel B of Table 4 reports the results from a probit regression analyzing what motivates investors to take the activist approach in the subsample that excludes the no-arbitrage cases. The two most important determinants from the unconditional analysis remain signficant (at the 1% level): a one-standard deviation increase in the announcement premium is associated with a 5.5% decrease in the marginal probability of being targeted by activists, and going-private deals are 5.9 percentage points more likely to invite activists. The consistency between the unconditional and conditional relations reaffirms the strong corporate governance motivation underlying activist arbitrageurs.

As a robustness check, the unconditional and conditional analyses are carried out for "friendly" deals only (not tabulated), because the type of contracting and requirements for votes are arguably more similar within this group. In this subsample we find that the results from both unconditional and conditional analyses are nearly identical to our main findings.

4 Deal Resolution: Completion Rates and Duration

4.1 Completion rates and activist arbitrage

After examining factors motivating activist arbitrageurs' involvement in merger deals, we now study how these arbitrageurs' campaigns affect the probability of deal consummation. On one hand, these sophisticated investors can push the target board to maximize shareholder value by rejecting inadequate offers and seeking higher bids; on the other hand, activist arbitrageurs' involvement could cause delays in the merger process, creating higher expectations and uncertainties that might drive potential suitors away. Whether activist arbitrageurs can create value for target shareholders depends on the tradeoff between positive revision returns (as shown in Table 3) and potentially heightened risk of deal failure.

To address the question, we run a probit regression to examine whether activist arbitrageurs' involvement can predict deal completion, controlling for important deal characteristics, such as the announcement premium, deal size, whether the offer is from a private acquirer and institutional ownership. Results are reported in Panel A of Table 5. It turns out that deals targeted by activist arbitrageurs are 3.6 percentage points less likely to be consummated, and the effect is economically meaningful but only marginally significant (at the 10% level), given the average deal failure rate for merger deals in our sample is about 14.8%. We also confirm that going-private deals have a lower probability of completion, possibly due to lower offer prices and greater resistance from shareholders. As expected and consistent with Hsieh and Walkling (2005), friendly deals are more likely to be completed. We also confirm earlier findings that tender offers are more likely to be consummated (Betton, Eckbo, and Thorburn, 2008) and that the use of defense tactics is associated with lowered deal success rates (Field and Karpoff, 2002).

[Insert Table 5 here.]

On the surface, at best activist arbitrageurs do not help to ease the closure of merger deals. This is somewhat in contradiction to the general goal of a risk arbitrageur who has the greatest incentive to have deals consummated (Cornelli and Li, 2002). This, however, may reflect both a selection and a substitution effect: as bargain hunters, activist arbitrageurs might buy into deals with lower ex-ante success rates, such as going-private deals, which could generate higher ex-post returns. On the other hand, an arbitrageur has to be willing to shut down some marginal deals in order to credibly extract better terms from the survivors.

To test this hypothesis, we construct a proxy for the ex-ante completion rate, and relate it to the ex-post success rate. The proxy is based on the intuition that the difference in the post-announcement price of the target's stock and the price offered by the acquirer reflects the market's belief of the probability of a deal's failure, in which case the price could fall back onto the pre-announcement level. As such, we define *Ex ante completion probability* as $(P_{+1} - P_{-1})/(P_{\text{Initial Offer}} - P_{-1})$, in which P_{-1} and P_{+1} denote the target's stock prices one day before and after the deal announcement, respectively.[11] This measure is similar to those used in Brown and Raymond (1986) and Larcker and Lys (1987), and captures the prevailing market wisdom about the deal outcome. Importantly, *Ex ante completion probability* empirically positively predicts the success of a deal: In our sample, a one-standard deviation increase in the measure leads to a 3.4 percentage point increase in success for an average deal, controlling for major deal characteristics. Moreover, to make sure that activist interventions do not contaminate this ex-ante completion rate, we eliminate 17 deals in which the activist arbitrageurs disclosed their holdings within one day of the deal announcement.

A simple comparison shows that the ex-ante completion probability for deals targeted by activists, at 70.9%, is 1.9 percentage points lower than that of the control sample, and the difference is statistically insignificant (t-statistic = -0.79). This suggests that activist arbitrageurs do not appear to target deals that are perceived by the market to have a lower

[11] Alternative measures such as $(P_{+1} - P_{-20})/(P_{\text{Initial Offer}} - P_{-20})$ and $(P_{+1} - P_{-10})/(P_{\text{Initial Offer}} - P_{-10})$ yield similar results.

likelihood of completion. We then examine how the relationship between ex-ante and ex-post deal completion rates differs between deals involving activist arbitrageurs and the other deals, controlling for deal characteristics. Results are reported in Panel B of Table 5, using a probit regression and including the same control variables as those in Panel A with the addition of *Ex ante completion probability*.

As expected, the coefficients on *Ex ante completion probability* are positive in both subsamples (deals with and without activist arbitrageurs), and both coefficients are significant at the 1% level. Importantly, we observe a sizable difference in the coefficients between the two samples: a one-standard deviation increase in the ex-ante completion probability leads to a 10.9 percentage point increase in the consummation of deals involving activists, as opposed to a 2.3 percentage point increase for deals involving no activists. The two-sample t-test for these two coefficient estimates rejects the null hypothesis that they are equal at the 5% significance level. These results imply that the presence of activist arbitrageurs is associated with a higher sensitivity of ex-post completion to ex-ante success probability.

In summary, the results in Table 5 suggest that although activist arbitrageurs do not appear to invest in merger targets with higher ex ante or ex post success rates, they tend to influence the outcome of the offer, making a deal more likely to succeed when it is more welcomed by the market. The theoretical work by Edmans, Goldstein, and Jiang (2015) and empirical study by Luo (2005) show that the sensitivity of deal completion to market reaction is indicative of corporate insiders learning from the collective wisdom of the market to make better investment decisions. Our results thus support the hypothesis that activists serve as monitors so as to make management more receptive to the cues from the market prices. This, coupled with the ability to generate superior revision returns (shown in Table 3), implies that activist arbitrageurs are capable of creating value for target shareholders.

4.2 Duration to deal resolution and activist arbitrage

Although activist arbitrageurs aim to enhance value accrued to the target's shareholders, their campaigns could cause delays in the merger process, potentially creating higher costs for shareholders. In this subsection, we analyze how activist arbitrageurs' involvement is related to the duration of the merger (from announcement to resolution). Table 6 reports the results. As a diagnostics test, column (1) of Table 6 reports the results from a linear regression where the dependent variable is the logarithm of deal duration, and the key independent variable is the dummy variable *Activist arbitrage*. Other covariates are the same as in Table 3, including deal size, the dummy variable for stock deals, and institutional ownership. The duration of a deal involving activist arbitrageurs on average takes 7.3% longer than those without (although the difference is not statistically significant at standard levels). The effects of the covariates are intuitive. On average, larger deals, stock mergers and deals that involve defense tactics take a longer time to consummate, while friendly bids and tender offers have a shorter duration.

[Insert Table 6 here.]

We next apply a formal duration model, the Cox proportional hazards model,[12] and report the results in column (2). The estimated hazard ratio (which is equal to the exponentiated coefficient) associated with the dummy variable *Activist arbitrage* is 0.86, implying that, conditional on a deal being in process, the probability of a deal closure on a given day is 0.86 times (or 14% lower than) that for deals involving no activist arbitrageurs, other things equal. The coefficient estimate is marginally significant at the 10% level. Imputed to the typical deal duration of 94.4 trading days, the participation of activists on average lengthens the process by an additional 15.4 trading days. The hazard ratios for all other control

[12] In the Cox model, the hazard function at a given time t (from initiation), conditional on the incompletion of the deal, is characterized as $h_i(t) = h_0(t)e^{X_i\beta}$ where $h_0(t)$ is an unspecified (or nonparametric) function.

variables are consistent with the OLS results both in terms of the qualitative interpretations and statistical significance.

For robustness, we repeat the estimation by using a Weibull model in column (3).[13] Interestingly, the estimated hazard ratio for the dummy variable *Activist arbitrage* is again 0.86, but the significance falls below conventional levels. Perhaps contrary to intuition, the combined results suggest that activist arbitrageurs' involvement only marginally (in terms of both economic magnitude and statistical significance) prolongs the duration to completion.

5 Returns from Activist Arbitrage

We now address the fundamental questions of whether and when activist risk arbitrageurs can create value for target shareholders and abnormal returns for themselves. For this analysis, we compute abnormal returns at the target companies over a variety of time windows, and we compare the abnormal returns for deals involving activist arbitrageurs, passive arbitrageurs, and no disclosed arbitrageurs. While this section focuses on activist arbitrage on the target side, Section 6 performs a similar exercise for activist arbitrage on the acquirer side.

5.1 Returns for merger targets: Pre- and post-arbitrage

Following Schwert (2000) and Hsieh and Walkling (2005), the total takeover premium received by a target company is estimated as the merger target's cumulative abnormal return from 54 trading days prior to the first bid announcement to deal resolution. The long window pre-announcement incorporates the well-documented "run-up" in M&A target companies' stock prices. Importantly, the full range of the return premium is not "tradeable" from the

[13] In the Weibull model, the hazard function at a give time t (from initiation), conditional on the incompletion of the deal, is characterized as $h_i(t) = \rho t^{\rho-1} e^{X_i \beta}$. The Weibull model earns its popularity for being flexible to allow a variety of increasing ($\rho > 1$), decreasing ($\rho < 1$), or constant ($\rho = 1$) shapes of the hazard function, determined by the estimated parameter value ρ.

perspective of an arbitrageur (activist or passive), who initiates a position only after the public announcement. We thus separate the full window into multiple sub-windows in order to assess the profitability of the activist arbitrage strategy.

First, we single out the arbitrageurs' cumulative abnormal returns ("CAR") measured over the [+2, resolution] window. Daily abnormal returns ("AR") are calculated for each stock using the Fama-French plus momentum four-factor model, with an estimation window of 255 days up to 54 days prior to announcement. CAR is the sum of daily ARs. For deals involving appraisal petitions by activists, we further add the "appraisal return," which is calculated as the difference between the appraisal value granted by the court and the stock price on the last trading day scaled by the latter.[14] As we noted in Section 2, the appraisal returns accrue only to the appraisal petitioning shareholders – a subset of the activist arbitrageurs – and not to other shareholders. For this reason, we provide analysis including and excluding appraisal arbitrages to calibrate returns to target shareholders in general and those to the activist arbitrageurs.

Following the literature (e.g., Gaspar, Massa, and Matos, 2005), we also separately estimate "run-up" and "markup," which are the CAR over trading days [-54, -1] and over [-1, resolution], respectively.

5.1.1 Returns from arbitrage in the targets

Given that activist arbitrageurs usually do not disclose their holdings in acquirers and that only 19 of 210 deals targeted by activist arbitrageurs are stock deals, the target long-only returns are a suitable measure of gains for most of the deals in our sample. Panel A of Table 7 presents cumulative abnormal returns for investors who hold long positions in target companies over the various time windows.

[14] Appraisal prices granted by a Delaware State judge are available for 14 appraisal petitions in our database. The average (median) appraisal return is 15.6% (19.6%). The average (median) length between deal completion and the appraisal decision is 1,043.1 (1,106) calendar days.

[Insert Table 7 here.]

Comparing the total takeover premiums (over the window of [-54, resolution]), Panel A of Table 7 shows that the takeover premium for deals involving activist arbitrageurs is about 24.9%, significantly (at the 5% level) lower than the average of 31.6% for deals targeted by passive arbitrageurs, and slightly (insignificant) lower than the average of 29.7% for deals involving no disclosed arbitrageurs. The differences corroborate our earlier finding that activist arbitrageurs tend to target deals with lower announcement premiums. Indeed, breaking down the total premium into various time windows, we find that the differences are almost fully accounted for in the "markup" and not in the "run-up," there does not appear to be any difference between deals involving activist and passive arbitrageurs (5.7% vs. 6.4%, the difference of which is far from significant). Such a pattern suggests that activist arbitrageurs do not rely on superior private information (whether through sophisticated takeover prediction models or insider information) prior to the deal announcements. In fact, activist arbitrageurs launch their campaigns after deal announcements and aim for superior returns from post announcement to deal resolution.[15] It is worth noting that the results are similar regardless of whether we include or exclude deals in which activist arbitrageurs only seek appraisal petitions without engaging in other campaign tactics. The similarity suggests that, by and large, activist arbitrageurs' endeavors constitute a "public good" for all shareholders who hold their shares in the target companies beyond the announcement date.

We now explicitly examine whether activist arbitrageurs are able to generate superior post-arbitrage abnormal returns in target companies, compared to passive arbitrageurs. As the information associated with the first bid usually has already been incorporated in stock prices by the end of the first full day of trading after the merger announcement, we focus on

[15]Thus, the strategy we study is critically different from that analyzed in Dai, Massoud, Nandy, and Saunders (2013), where speculators trade on private information before the M&A announcement date.

the CAR over the [+2, resolution] window to gauge activist arbitrageurs' ability to generate extra returns by campaigning against the merger under the currently stated terms. The average [+2, resolution] CAR (including failed deals) is 4.8% for deals involving activist arbitrageurs, greater than the average of 1.6% for those targeted by passive arbitrageurs and the average of -1.3% for those involving no disclosed arbitrageurs. However, only the difference with the latter is significant (at the 5% level). In annualized terms, the difference amounts to 14.4% vs. 4.1% (this difference is significant at the 5% level). It is worth noting that deal duration plays little role in annualizing the difference as the median durations of the two groups are close at 86 and 80 trading days, respectively. The differences in the median abnormal returns are of comparable magnitude. The median CAR is 2.4% for deals targeted by activists, while it is close to zero (0.1%) for passive arbitrageurs. The difference in the medians between these groups indicates that cumulative positive returns after the first full day of trading only occur at the deals involving activists.

Activist arbitrageurs take positions at different times. We thus also examine their "tradeable returns" using time windows calibrated to their possible actual investment horizons. More specifically, we set the starting time to be $max(+2, disclosure - 10)$, the latter of day +2 and 10 (calendar) days before an activist arbitrageur's disclosure of a large equity stake in the target company in its Schedule 13D filings. The securities law allows ten (calendar) days between when an investor crosses the 5% ownership threshold and when the investor must file a Schedule 13D if the investor intends to influence corporate policies or control (which an activist arbitrageur clearly does). Thus, this return window identifies a portion of the run-up returns which the arbitrageurs could capture.[16] Using this measure, the average CAR during the [max(+2, disclosure−10), resolution] window is 5.0%, slightly higher than our main return measure, and significantly higher than the same measure for the passive arbitrage (at the 10% level) and the no-arbitrage (at the 5% level) subsamples.

[16]In our sample, 54 of the 210 disclosures by activist arbitrageurs are not through Schedule 13D filings. For these days we just use the disclosure date without subtracting the ten days.

For completeness, the table also presents short-term target stock returns around activist arbitrageurs' disclosure dates. Using a 20-day window around their disclosure dates, both the average and median CARs are about 2.0% (both significantly different from zero at the 5% level), suggesting that the market revised up the total premium expected upon the emergence of the activist arbitrageurs. Excluding deals involving appraisal appeals only, the order of magnitude is similar.

5.1.2 Returns from long-short strategies

For stock deals, risk arbitrageurs often simultaneously take a long position in the target and a short position in the acquirer where the ratio of the long-short positions is set to be equal to the stock exchange ratio. In such a strategy, an arbitrageur locks in the spread and profits from its full convergence if the deal goes through as planned. It turns out that few stock deals are targeted by activist arbitrageurs (19 out of 210 deals), while more than 20% of deals involving passive arbitrageurs are stock deals. Panel B of Table 7 reports the long-short portfolio returns for the same set of time windows as those in Panel A. Earlier research documents that the long-short abnormal returns are typically higher than long-only returns because acquirers' stock prices tend to decrease after deal announcements (Mitchell, Pulvino and Stafford, 2004). Despite the small sample, it turns out that the long-short CAR for activist arbitrageurs is larger than those enjoyed by the passive arbitrageurs (but the difference is not significant) and than returns incurred in deals with no disclosed arbitrageurs (the difference is significant at the 5% level).

5.1.3 Returns for completed and withdrawn deals

To further identify the sources of post-arbitrage returns generated by activist arbitrageurs, we examine completed and withdrawn deals separately. Panel C presents long-only abnormal returns in the targets for completed mergers. Target firms involving activists

on average have lower total takeover premiums, run-ups and markups than those involving passive or no disclosed arbitrageurs, consistent with the findings in Table 3 as well as those in Panel A of Table 7. Importantly, the average CAR over the [+2, resolution] window for deals targeted by activists almost doubles that for deals involving passive arbitrageurs (7.4% vs. 3.2%, the difference of which is significant at the 10% level). This larger spread, relative to that in Panel A, is a strong indication that activist arbitrageurs are capable of pushing for higher bids for deals that are eventually successful. The alternative post-arbitrage return measure yields consistent results.

Returns for withdrawn deals are reported in Panel D of Table 7. As expected, the total takeover premiums, run-ups and markups for both types of arbitrage are significantly lower than those for successful deals. The total takeover premium and markup for deals targeted by activists are again lower than those involving passive arbitrageurs. Interestingly, the average CAR for the [+2, resolution] window for deals involving activist and passive arbitrageurs are similar (-6.6% vs. -7.7%, the difference of which is far from significant). The same average return for no-arbitrage deals is even lower, but the differences are not significant due to the relatively small sample size. Therefore target shareholders do not fare worse with activists even conditioning on deal failure. Moreover, the average shorter-term return during the time window of activist emergence, i.e., the CAR over [max(+2, disclosure−10), disclosure+10], is of similar magnitude to the successful deals (about 2%, but insignificantly different from zero), indicating that the market has expected a positive effect of activist arbitrageurs' involvement even for ex post failed deals.

The combined evidence suggests that activists generate higher premium revisions for target shareholders in successful deals, but do not cause larger losses if deals fail. Earlier results (reported in Table 5) show that activist involvement only modestly increases deal failure. Hence, the news of their emergence invites positive market responses, regardless of the ex post outcome.

6 Activist Arbitrage in Acquirers

For completeness we supplement the analysis of arbitrage on the target companies with the same analysis for publicly traded acquiring firms. Following the procedure detailed in Section 2, we identify 40 cases where activists act in accordance with their rights as shareholders of the acquirers. The following subsections provide a brief report on the characteristics of acquiring firms involving activist arbitrageurs as well as the returns from their endeavors.

6.1 Characteristics of deals involving activist arbitrageurs

Similar to Table 2, Table 8 reports the characteristics of deals in which activists attempt to change the course of an announced deal from the acquirer side (column (1)), and compares the average statistics with those from all deals involving no activists (column (2)) and a one-to-many matched sample (column (3)). The matched company for each acquirer targeted by activists is assigned from the same year, same SIC three-digit industry, and same deal-size decile.

[Insert Table 8 here.]

Relative to deals involving no such investors, deals targeted by activist arbitrageurs on average are much larger and are more likely to involve multiple bidders. This suggests that activist arbitrageurs are more likely to descend on an acquirer when the deal may be perceived to be more risky and the acquiring firm could overpay substantially due to bidding wars. Performance of these acquirers is also worse as measured by their return on assets. Importantly, deals held by activists have a large negative revision return (-11%) on average (significantly lower than control samples at the 5% level), indicating that activist arbitrageurs are often successful in forcing the acquirer to lower its bid, if the deal still goes through. On the other hand, for deals targeted by activist arbitrageurs, deal duration is

significantly longer, and the completion rate is much lower (both significant at the 5% level). Thus, activists tend to block mega-deals by attempting to lower the bids, increasing the risk of losing the deal altogether. Such actions could benefit acquirer shareholders if a substantial portion of the M&A deals are value destroying for acquirer shareholders, as suggested by Moeller, Schlingemann, and Stulz (2005). This is confirmed by the return analysis in the section to follow.

6.2 Returns from activist arbitrage in acquirers

We would like to re-emphasize that the positions activist risk arbitrageurs take in the acquirers tend to be the opposite of those taken by the passive risk arbitrageurs. In a conventional passive risk arbitrage, an investor shorts the acquirer as part of the strategy built on spread convergence. However, the activist arbitrageurs in acquirers are actually long the acquirer and hope to advocate, as shareholders, for modifications to the announced deals in the hope of lowering the bids or blocking the over-paying deals (both of which lead to value improvement for the acquirers).[17] Such a difference makes activist risk arbitrage a novel addition to the strategy space as well to the literature.

[Insert Table 9 here.]

Table 9 reports abnormal returns for activist investors who long acquiring firms and campaign against the deals in their current forms. For the run-up, we do not find much of a difference between deals held by activists and other deals. As expected, activist arbitrageurs earn a much higher average return, compared to investors in other deals, in the post-deal announcement time period. The average CAR over the [+2, resolution] window is 6.5% for the activists, greater than a -3.0% return for investors in other deals (the difference is significant at the 10% level) and a -0.4% for those investing in matched deals. For robustness, we also

[17] This is not to be confused with activist arbitrageurs in target companies who may take auxiliary short positions in acquirers for stock deals.

calculate CAR over the $[max(+2, disclosure\text{-}10), resolution]$ period for activist arbitrageurs and other investors, in which *disclosure* denotes the date activists disclose their positions in the acquirer. The results are consistent with our main findings. Relatedly, the market reaction to the disclosure of activist involvement is positive: the average CAR of the acquirer stocks measured over the 20-day window around the disclosure date is 2.3%, significantly different from zero at the 10% level.

On an annualized basis, the average return accrued to the activist arbitrageurs is 14.5% from post-deal announcement to resolution, almost the same magnitude as the average returns received by activists who intervene in merger targets. In contrast, acquirer shareholders in deals without activist intervention receive substantially negative returns post deal announcement.

7 Conclusion

We provide the first study on a relatively new phenomenon of "activist risk arbitrage," in which activist shareholders wield their influence over corporate control changes by blending shareholder activism into an M&A arbitrage strategy. More specifically, the activist arbitrageurs attempt to block an announced M&A deal through public campaigns in order to extract better terms. Compared to the conventional (passive) risk arbitrage, activist arbitrageurs are more likely to select deals that are more susceptible to managerial conflicts of interest, including going-private deals (especially management buy-outs), "friendly" deals (in which the boards endorse preferred buyers), and deals with lower announcement premiums. Activists do not demonstrate a strong preference for deals with a high ex-ante completion probability. However, their action increases the sensitivity of deal completion to market responses. That is, the presence of activist arbitrageurs increases the probability that the deals that are welcomed by the market will be completed. Finally, activist risk arbitrage yields

significantly higher returns than passive arbitrage, with little incremental deal risk. Overall, evidence suggests that activist risk arbitrage plays a positive role in guarding investor interests in corporate control events, while delivering good returns for themselves.

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Figure 1: Stock Performance for Targets Involving Activist and Passive Arbitrageurs

This figure illustrates the typical path of activist arbitrage in the target company of an M&A transaction from initial deal announcement to resolution, and compares it with that of a passive arbitrage.

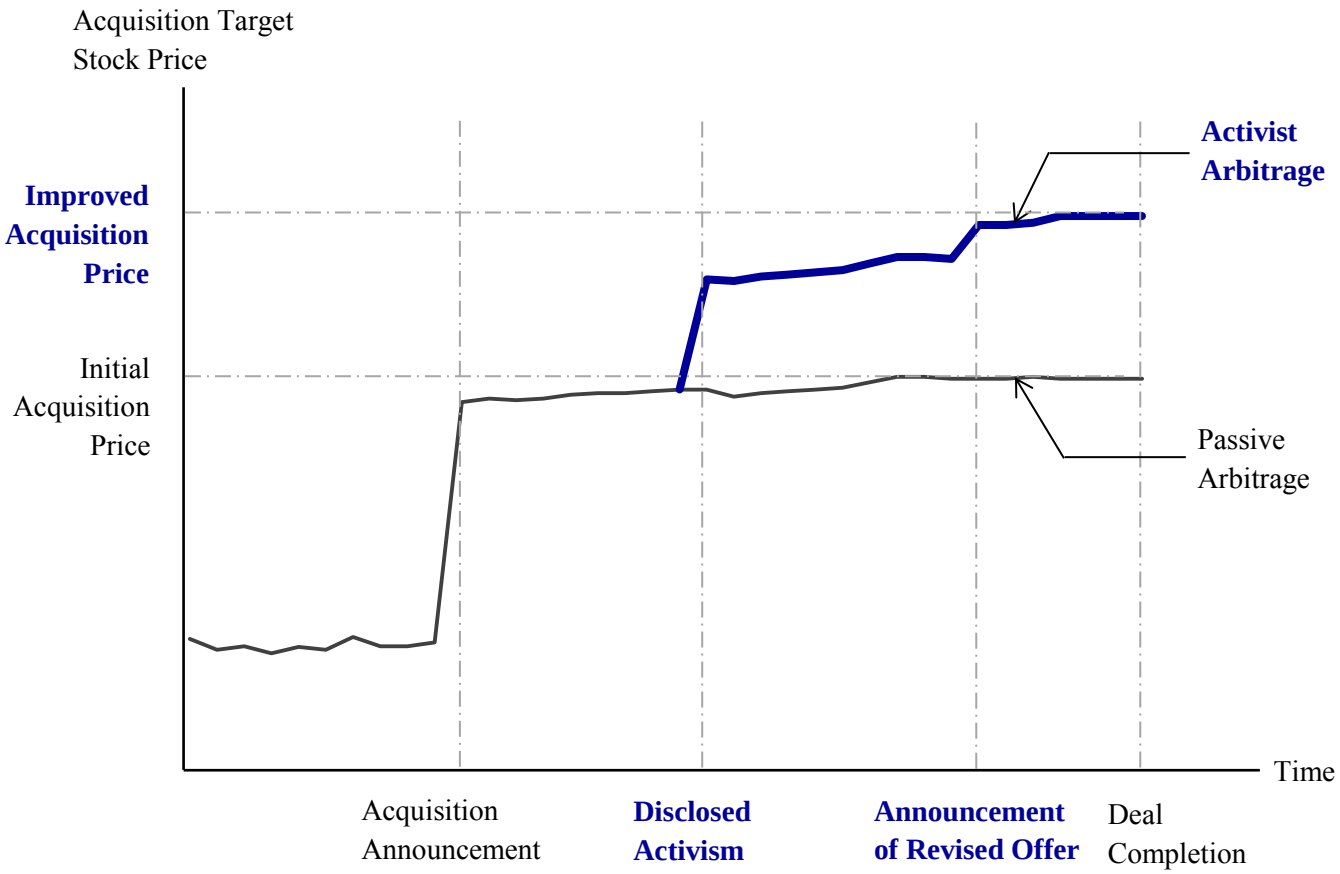

Figure 2: M&A Transactions and Activist Arbitrageur Activities, 2000-2013

This figure shows the annual volume of M&A transactions and activist arbitrage activities from 2000 to 2013. The blue bars (left axis) plot the number of annual M&A transactions in each year. The red line (right axis) plots the number of merger targets that are held by activist arbitrageurs. Data sources include the Securities Data Company ("SDC"), SharkRepellent, Schedule 13D filings, and Factiva. Section 2 provides the detailed information about the sample and data.

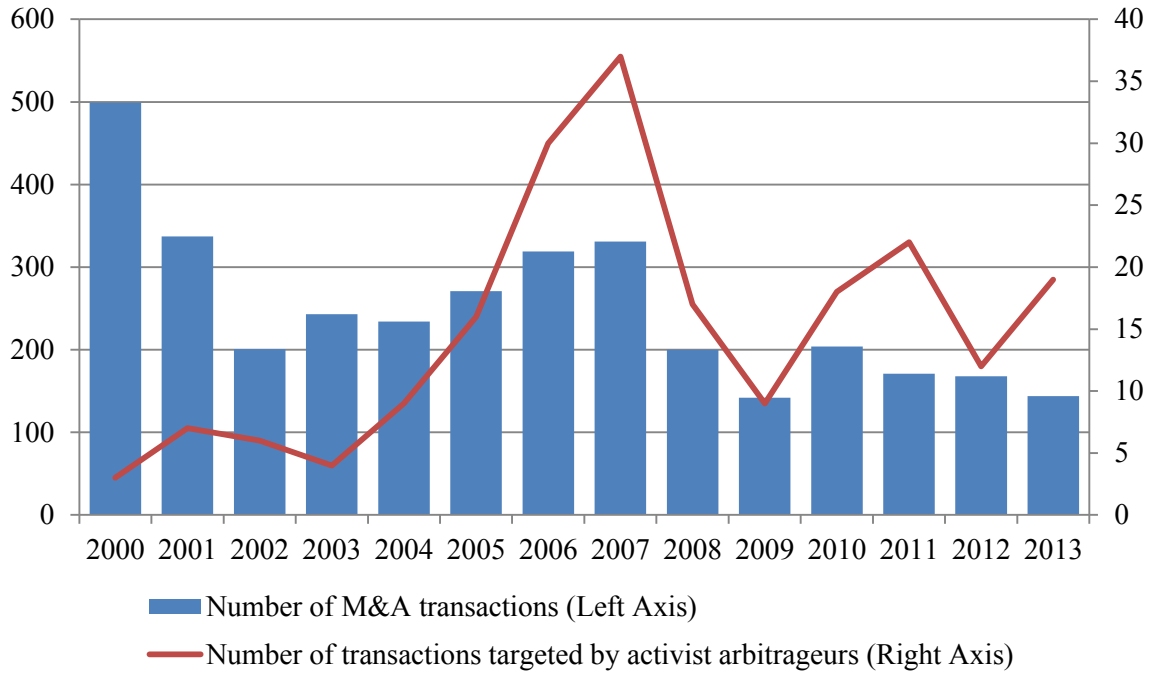

Figure 3: An Illustration of the Identification of Passive Risk Arbitrageurs

The identification of passive risk arbitrage from the Thomson Reuters 13F Ownership Database requires that a deal spans at least two quarters. This means that is an M&A deal is announced during quarter *t*, the case must be resolved (completed or withdrawn) after the end of quarter *t*. Additionally, a 13F-filing institution is only classified as a passive risk arbitrageur if it exhibits a positive change in stock ownership in at least 6 deals and in more than 60% of all deals in which it has holdings.

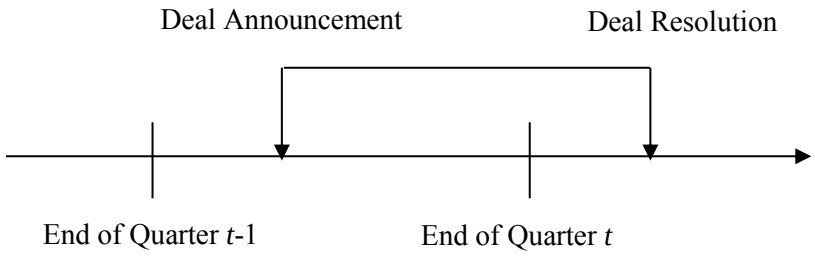

Table 1: Top Players in Activist Risk Arbitrage

This table lists the players in our sample that invested in at least four merger transactions during 2000-2013. Collectively they participated in 31.0% of all the deals.

Activist Risk Arbitrageur	Frequency	Rank
GAMCO Investors, Inc.	7	1
Ramius LLC	7	1
Carl C. Icahn	6	3
Elliott Associates, LP	6	3
Dolphin Limited Partnership I, LP	5	5
Millennium Management LLC	5	5
Carlson Capital, LP	5	5
JANA Partners LLC	4	8
SAC Capital Advisors	4	8
CtW Investment Group	4	8
Marathon Partners, LP	4	8
Merion Capital, LP	4	8
First Eagle Investment Management (formerly Arnhold & S. Bleichroeder Advisers LLC)	4	8

Table 2: Activist Risk Arbitrageurs' Capital Commitment and Investment Horizon

Columns (1) and (2) of this table report the summary statistics of the size of activist risk arbitrageurs' stakes at the time of disclosure, both in dollar values and as a percentage of outstanding shares of the target companies. The "Initial" columns report the stakes that the lead activist risk arbitrageur holds in a merger target when it files the initial Schedule 13D or issue the first press release. The "Maximum" columns report the maximum stakes activist arbitrageurs attain during the event. Columns (3) and (4) report the number of trading days between the deal announcement and initial disclosure of arbitrageur stakes, and that between the initial disclosure and deal consummation/withdrawal. The sample size is 210 deals from 2000 to 2013.

	(1)		(2)		(3)	(4)
	Value of invested capital ($millions)		% Ownership		Trading days between deal announcement and initial disclosure	Trading days between initial disclosure and resolution
	Initial	Maximum	Initial	Maximum		
Mean	106.6	132.8	8.9%	10.6%	31.0	72.5
Std. Dev.	269.0	307.9	8.2%	9.3%	44.0	54.1
5th Percentile	1.4	1.5	1.0%	1.0%	2	15
25th Percentile	6.4	7.4	5.0%	5.2%	5	33
Median	22.0	25.5	7.1%	8.2%	15	60
75th Percentile	82.2	107.0	10.0%	13.7%	40	96
95th Percentile	455.7	618.1	23.6%	25.0%	113	178

Table 3: Deal Characteristics

This table reports characteristics of 210 deals involving activists, and compares them to 2,681 deals with passive-only arbitrageurs and 573 deals with no disclosed arbitrageurs, respectively. Our sample includes all cash, stock and hybrid deals from 2000 to 2013. Activist arbitrageurs are identified through their schedule 13D filings or press releases. A two-step procedure developed in Hsieh and Walkling (2005) identifies passive risk arbitrageurs, the details of which are described in Section 2. *Announcement premium* is calculated as $(P_{Offer} - P_{-1})/P_{-1}$, where P_{Offer} and P_{-1} are the initial offer price and previous-day close of the target firm's stock price. *Deal value ($ million)* is the total value of consideration paid by the acquirer, excluding fees and expenses. *Return on assets* (ROA) is defined as the ratio of earnings before interest, tax, depreciation and amortization (EBITDA) scaled by lagged assets. *Revision return* is calculated as $(P_{Final} - P_{Offer})/P_{-1}$, where P_{Final} is the final deal price. *Completion rate* is the ratio of announced deals that are eventually completed. *Deal duration* is measured as the number of trading days between the first takeover announcement and the announced resolution of the deal. *Going private* is a dummy variable equal to one if the acquisition involves a publicly traded company being converted into a private entity, usually by insider-led buyouts. *Acquirer toehold* is the percentage of target shares held by the acquirer prior to the announcement. *Multiple bidders* is a dummy variable equal to one if multiple bidders compete for the target. *Friendly* is a dummy variable with a value of zero if the target company resists or receives an unsolicited offer as reported in the Securities Data Company (SDC). *Defense* is a dummy variable equal to one if the target firm has used defensive tactics against the acquisition as determined by the SDC. *Tender offer* is a dummy variable equal to one if the bid takes the form of a tender offer. Finally, *Institutional ownership* is the proportion of shares held by institutional investors as reported by the Thomson Reuters Ownership Database. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Merger targets held by activist risk arbitrageurs			Difference with targets by passive-only arbitrageurs		Difference with targets with no disclosed arbitrageurs	
Deal characteristics	Average (1a)	Medium (1b)	Std. Dev. (1c)	Diff. in Avg. (2a)	*t*-stat. of Diff. (2b)	Diff. in Avg. (3a)	*t*-stat. of Diff. (3b)
Announcement premium	19.1%	14.6%	22.8%	-13.1%***	-7.47	-20.2%***	-7.58
Deal value ($ million)	2,274.7	498.6	5,087.3	184.3	0.50	1,888.5***	5.26
Return on assets (ROA)	13.8%	11.5%	18.3%	0.5%	0.34	3.7%**	2.50
Revision return	4.7%	0	11.5%	3.6%***	4.25	3.3%***	3.20
Completion rate	81.0%	1	39.4%	-5.7%**	-2.04	2.3%	0.71
Deal duration	101.7	86	66.2	7.2	1.52	5.8	1.09
% Going private	45.2%	0	49.9%	18.8%***	5.33	18.7%***	4.79
% Stock deal	11.4%	0	31.9%	-10.5%***	-4.53	-12.3%***	-4.36
% Acquirer toehold	2.5%	0	8.8%	1.1%*	1.77	0.5%	0.71

	Merger targets held by activist risk arbitrageurs			Difference with targets by passive-only arbitrageurs		Difference with targets with no disclosed arbitrageurs	
Deal characteristics	Average (1a)	Medium (1b)	Std. Dev. (1c)	Diff. in Avg. (2a)	*t*-stat. of Diff. (2b)	Diff. in Avg. (3a)	*t*-stat. of Diff. (3b)
% Multiple bidders	24.8%	0	43.3%	16.6%***	5.48	13.1%***	4.01
% Friendly	94.8%	1	22.3%	0.9%	0.56	2.7%	1.39
% Defense	1.4%	0	11.9%	-2.5%***	-2.82	-2.4%**	-2.13
% Tender offer	16.2%	0	36.9%	2.1%	0.80	3.5%	1.19
Institutional ownership	56.5%	54.6%	27.7%	3.8%*	1.89	37.1%***	17.57

Table 4: Determinants of Activist Risk Arbitrageurs' Involvement in Merger Targets

This table examines the determinants of activist risk arbitrageurs' involvement in merger targets. All independent variables are as defined in Table 3, and are measured at the date of announcement. Columns (1) and (2) of Panel A report results from fitting an unordered choice (multinomial logit) model using the full sample of all mergers from 2000 to 2013. The base outcome is a merger target that does not involve disclosed arbitrageurs (category = 0). Panel B applies a probit model on the subsample that excludes category = 0. The dependent variable is a dummy variable equal to 1 if the deal is targeted by activist arbitrageurs, and 0 if it involves only passive arbitrageurs. In each column we report probit coefficients, their heteroscedasticity-robust *t*-statistics, and the marginal probability change induced by a one unit change in the value of a specific covariate from its sample average. *, ** and *** indicate statistical significance at the10%, 5% and 1% levels, respectively.

Panel A

	Unordered Choice Model					
Deal characteristics	Deals with activist arbitragers (category=1) (1a)	*t*-stat. (1b)	Marg. Prob. (1c)	Deals with passive arbitragers (category=2) (2a)	*t*-stat. (2b)	Marg. Prob. (2c)
Announcement premium	-2.75***	-6.07	-16.1%	-0.09	-0.56	13.2%
Going private	0.80***	3.54	4.8%	0.01	0.05	-4.1%
Friendly	1.32***	2.73	3.3%	0.87***	3.12	5.9%
Institutional ownership	4.61***	9.05	6.0%	4.13***	10.66	36.6%
Deal value (log $ million)	0.47***	5.37	0.3%	0.48***	7.49	4.6%
Acquirer toehold	0.04***	2.94	0.1%	0.02**	2.28	0.1%
Return on assets (ROA)	0.16	0.25	-0.3%	0.25	0.57	2.8%
Stock deal	-0.25	-0.72	-2.8%	0.24	1.40	4.9%
Defense	-0.98	-1.34	-3.1%	-0.52	-1.37	-2.5%
Tender offer	0.09	0.30	2.3%	-0.33*	-1.74	-5.4%
Observations	2,350					
Pseudo R-squared	0.24					
% (Dep variable = 1)	6.8%			80.2%		

Table 4 – Continued

Panel B

	Conditional Probit (Dummy for Activist Arbitrageurs)		
	Coefficient	*t*-stat.	Marg. Prob.
Deal characteristics	(1a)	(1b)	(1c)
Announcement premium	-1.25***	-5.27	-16.2%
Going private	0.40***	4.23	5.9%
Friendly	0.16	0.81	1.9%
Institutional ownership	0.32*	1.67	3.6%
Deal value (log $ million)	-0.01	-0.24	-0.1%
Acquirer toehold	0.01	1.30	0.1%
Return on assets (ROA)	0.01	0.05	0.1%
Stock deal	-0.23	-1.59	-2.7%
Defense	-0.23	-0.79	-2.5%
Tender offer	0.20	1.60	2.8%
Observations	2,046		
Pseudo R-squared	0.10		
% (Dep variable = 1)	7.9%		

Table 5: Activist Risk Arbitrage and Ex-ante and Ex-post Completion Rates

This table relates merger deal completion to the involvement of activist arbitrageurs and ex ante prospects of deal completion. All variables unless otherwise specified are as defined in Table 4. The sample consists of all M&A deals between 2000 and 2013. Panel A reports the effects of activist arbitrageurs' presence and other covariates on the probability of deal consummation. The dependent variable is a dummy variable equal to 1 if a deal is eventually completed. Panel B compares the determinants of deal completion between deals with and without arbitrageurs. The key independent variable ex-ante completion rate is proxied by $(P_{+1} - P_{-1})/ (P_{Offer} - P_{-1})$, in which P_{Offer} is the initial offer price and P_{-1} (P_{+1}) is the target firm's closing stock price one day prior to (after) the deal announcement date. In each column we report probit coefficients, their heteroscedasticity-robust *t*-statistics, and the marginal probability change induced by a one unit change in the value of a specific covariate from its sample average. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A

Dependent Variable: Deal completion			
	Coefficient	*t*-stat.	Marg. Prob.
	(1a)	(1b)	(1c)
Activist arbitrage	-0.19*	-1.70	-3.6%
Deal value (log $ million)	0.09***	3.87	1.6%
Going private	-0.52***	-7.27	-10.9%
Stock deal	-0.13	-1.57	-2.5%
Acquirer toehold	-0.01	-0.54	-0.1%
Friendly	2.15***	18.68	69.5%
Tender offer	0.60***	5.07	8.3%
Defense	-0.34**	-2.40	-7.5%
Log(duration)	0.05	0.86	1.0%
Institutional ownership	-0.28*	-1.89	-5.2%
Observations	3,325		
Pseudo R-squared	0.29		
% (Dep variable = 1)	85.1%		

Table 5 – Continued

Panel B

Dependent Variable: Deal completion	Deals with activist arbitrageurs			Deals without activist arbitrageurs			
	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.	*t*-stat. for the diff. between (1a) and (2a)
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	
Ex ante completion probability	1.27***	3.62	35.0%	0.52***	4.77	8.9%	2.13**
Deal value (log $ million)	0.24***	2.70	6.5%	0.08***	3.34	1.4%	1.68*
Going private	-0.97***	-3.59	-26.9%	-0.45***	-5.84	-8.8%	-1.86*
Stock deal	0.13	0.31	3.5%	-0.01	-0.02	-0.1%	0.31
Acquirer toehold	0.01	0.35	0.2%	-0.01	-1.20	-0.1%	0.64
Friendly	1.22***	2.65	44.1%	2.16***	17.66	68.7%	-1.95*
Tender offer	1.00**	2.26	19.5%	0.52***	4.14	6.9%	1.04
Defense	-0.35**	-2.26	-7.6%	-0.34**	-2.25	-7.1%	-0.05
Log(duration)	0.13	0.71	3.7%	0.04	0.61	0.7%	0.46
Institutional ownership	-1.01*	-1.71	-27.9%	-0.35**	-2.21	-5.9%	-1.09
Observations	184			3,138			
Pseudo R-squared	0.30			0.26			
% (Dep variable = 1)	79.7%			85.6%			

Table 6: Duration Analysis of Activist Risk Arbitrage

This table analyzes the relation between deal duration and the presence of activist risk arbitrageurs using the full sample of all M&A deals from 2000 to 2013. All variables are as defined in Table 4. Column (1) reports results of an OLS model where the dependent variable is the logarithm of deal duration, i.e., the number of trading days between the first formal takeover announcement and the announced resolution of the deal, is regressed on the activist arbitrageur dummy and major deal covariates. Column (2) applies a Cox proportional hazards model to estimate the hazard rate for deal completion. In column (3), we repeat the same analysis by adopting a Weibull parametric model for the hazard function. In each column we report the coefficient estimates, their heteroscedasticity-robust *t*-statistics, and hazard ratios (or exponentiated coefficients) where applicable. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	OLS		Cox Model			Weibull Model		
	Coefficient	*t*-stat.	Coefficient	*t*-stat.	Hazard ratio	Coefficient	*t*-stat.	Hazard ratio
	(1a)	(1b)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
Activist arbitrage	0.07	1.47	-0.16*	-1.85	0.86	-0.16	-1.53	0.86
Announcement premium	0.01	0.11	0.04	0.74	1.04	0.01	0.21	1.01
Deal value (log $ million)	0.07***	8.97	-0.11***	-8.06	0.89	-0.13***	-6.73	0.88
Going private	-0.02	-0.85	0.01	0.15	1.01	-0.03	-0.43	0.97
Stock deal	0.09***	3.82	-0.10**	-2.42	0.90	-0.08	-1.49	0.92
Acquirer toehold	0.01***	6.60	-0.02***	-7.71	0.98	-0.03***	-6.16	0.97
Defense	0.17***	2.62	-0.41***	-3.77	0.66	-0.41***	-3.22	0.66
Friendly	-0.10*	-1.81	0.35***	3.66	1.41	0.40***	3.44	1.50
Tender offer	-0.53***	-16.94	0.86***	10.46	2.37	0.79***	8.28	2.21
Institutional ownership	-0.27***	-6.06	0.51***	5.59	1.67	0.57***	4.64	1.77
Observations	3,179		3,179			3,179		
R-squared	0.16							
$\hat{\rho}$						1.85		
% (Dep variable = 1)	6.10%		6.10%			6.10%		

Table 7: Cumulative Abnormal Returns and Activist Risk Arbitrage

This table reports cumulative abnormal returns ("CAR") for deals held by activist or passive arbitrageurs and those lacking arbitrageurs. *Run-up* is defined as the Fama-French-Carhart four-factor CAR of the target's stock during the [-54, -1] trading day window relative to the date of the first bid. *Markup* is calculated as the four-factor CAR of the target's stock during the [-1, resolution] window where resolution can be either effective deal completion or withdrawal. *Takeover premium* is the sum of *Run-up and Markup*. *CAR [+2, resolution]* is the CAR from the second trading day after deal announcement to resolution. *CAR [max(+2, disclosure-10), resolution]* is the CAR from the latter of ten calendar days before an activist arbitrageur's Schedule 13D filing or two days post deal announcement to deal resolution. CARs are measured by using the four-factor model with an estimation window of 255 days up to 54 days prior to announcement. The identification of passive arbitrageurs follows the Hsieh and Walkling (2005) algorithm based on changes in quarter-end institutional holdings (13F) before and after the deal announcement.

The calculation of risk arbitrage returns follows Hsieh and Walkling (2005). For cash deals, arbitrageurs' daily total return is the merger target's stock return on day *t*. For stock deals, arbitrageurs' daily total return equals the difference between the stock daily return and $(P_{t-1}^A/P_{t-1})\delta[(P_t^A + D_t^A)/P_{t-1}^A - 1)]$ where δ is the exchange-rate of the stock offer, and P_t^A and D_t^A are the acquirer's stock price and dividend payment on day *t*, respectively. For deals involving appraisal petitions by activists, the "appraisal return" is further added to the total return, where the appraisal return is calculated as the difference between the appraisal value and the stock price on the last trading day scaled by the latter. In each column we report the summary statistics and the associated *t*-statistics or *z*-statistics (in brackets). *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Cumulative Abnormal Returns: Long Merger Targets

	Deals with activist arbitrageurs				Deals with passive arbitrageurs (n=2,669)			Deals without disclosed arbitrageurs (n=562)		
	All (n=209)		Excluding appraisal–only deals (n=194)							
	(1a) Mean	(1b) Median	(1c) Mean	(1d) Median	(2a) Mean	(2b) Median	(2c) Diff. b/t (1a) & (2a)	(3a) Mean	(3b) Median	(3c) Diff. b/t (1a) & (3a)
Takeover premium [-54, Resolution]	24.9%***	22.3%***	24.6%***	21.2%***	31.6%***	26.6%***	-6.7%**	29.7%***	30.9%***	-4.8%
	[8.13]	[7.46]	[7.66]	[7.32]	[27.98]	[28.30]	[-2.05]	[8.57]	[13.12]	[-1.04]
Run-up [-54, -1]	5.7%***	3.5%***	6.4%***	4.2%***	6.4%***	4.0%***	-0.7%	7.0%***	4.3%***	-1.3%
	[3.01]	[2.93]	[3.18]	[3.27]	[11.12]	[10.35]	[-0.35]	[4.45]	[6.74]	[-0.53]
Markup [-1, Resolution]	19.7%***	19.2%***	18.7%***	18.6%***	26.1%***	22.0%***	-6.4%**	23.6%***	20.6%***	-3.9%
	[8.17]	[7.74]	[7.48]	[7.50]	[28.74]	[30.01]	[-2.48]	[8.66]	[13.13]	[-1.07]
CAR [+2, Resolution]	4.8%**	2.4%	4.3%**	2.0%*	1.6%**	0.1%**	3.2%	-1.3%	-1.3%	6.1%**
	[2.35]	[1.56]	[1.99]	[1.85]	[2.43]	[2.12]	[1.49]	[-0.59]	[-0.91]	[2.02]

	Deals with activist arbitrageurs				Deals with passive arbitrageurs (n=2,669)			Deals without disclosed arbitrageurs (n=562)		
	All (n=209)		Excluding appraisal–only deals (n=194)							
	(1a) Mean	(1b) Median	(1c) Mean	(1d) Median	(2a) Mean	(2b) Median	(2c) Diff. b/t (1a) & (2a)	(3a) Mean	(3b) Median	(3c) Diff. b/t (1a) & (3a)
CAR [max(+2, Disclosure – 10), Resolution]	5.0%** [2.67]	2.6%** [2.13]	4.7%** [2.37]	2.2%** [2.52]	1.6%** [2.43]	0.1%** [2.12]	3.4%* [1.71]	-1.3% [-0.59]	-1.3% [-0.91]	6.3%** [2.17]
CAR [max(+2, Disclosure – 10), Disclosure + 10]	2.0%*** [2.95]	1.5%*** [3.06]	2.2%** [2.37]	1.7%*** [3.16]						

Panel B: Cumulative Abnormal Returns: Long-Short Strategies for Stock Deals

	Deals with activist arbitrageurs (n=19)		Deals with passive arbitrageurs (n=514)		Deals without disclosed arbitrageurs (n=102)			
	(1a)	(1b)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
	Mean	Median	Mean	Median	Diff. b/t (1a) & (2a)	Mean	Median	Diff. b/t (1a) & (3a)
Takeover premium [-54, Resolution]	9.0% [0.78]	17.0% [0.85]	34.4%*** [12.00]	25.9%*** [10.38]	-25.4%** [-2.13]	6.6% [0.65]	18.2%*** [2.62]	2.4% [0.16]
Run-up [-54, -1]	-17.6%*** [-2.85]	-17.2%*** [-2.33]	4.9%*** [3.22]	2.6%** [2.29]	-22.5%*** [-3.53]	-13.6%*** [-3.00]	0.5% [-0.85]	-4.0% [-0.52]
Markup [-1, Resolution]	27.0%*** [2.80]	20.5%** [2.37]	30.6%*** [12.98]	24.9%*** [13.16]	-3.6% [-0.36]	20.9%*** [2.86]	18.2%*** [4.02]	6.1% [0.50]
CAR [+2, Resolution]	22.5%*** [2.59]	21.5%** [2.29]	8.9%*** [4.58]	5.7%*** [5.33]	13.6% [1.53]	-5.1% [-0.76]	-0.8% [-0.43]	27.6%** [2.52]
CAR [max(+2, Disclosure – 10), Resolution]	20.4%** [1.99]	18.1%** [2.07]	8.9%*** [4.58]	5.7%*** [5.33]	11.5% [1.10]	-5.1% [-0.76]	-0.8% [-0.43]	25.5%** [2.09]
CAR [max(+2, Disclosure – 10), Disclosure + 10]	9.9%** [2.06]	4.9%** [2.55]						

Panel C: Cumulative Abnormal Returns for Completed Deals: Long Merger Targets

	Deals with activist arbitrageurs				Deals with passive arbitrageurs (n=2,334)			Deals without disclosed arbitrageurs (n=447)		
	All (n=169)		Excluding appraisal rights only (n=154)							
	(1a) Mean	(1b) Median	(1c) Mean	(1d) Median	(2a) Mean	(2b) Median	(2c) Diff. b/t (1a) & (2a)	(3a) Mean	(3b) Median	(3c) Diff. b/t (1a) & (3a)
Takeover premium [-54, Resolution]	27.5%***	23.5%***	27.5%***	22.9%***	34.1%***	27.6%***	-6.6%*	34.9%***	32.9%***	-7.4%
	[8.22]	[7.24]	[7.76]	[7.10]	[28.92]	[28.29]	[-1.86]	[9.54]	[13.57]	[-1.49]
Run-up [-54, -1]	5.4%**	3.6%**	6.3%***	5.4%***	6.4%***	4.0%***	-1.0%	8.0%***	4.1%***	-2.6%
	[2.54]	[2.56]	[2.75]	[2.93]	[10.63]	[10.07]	[-0.45]	[4.54]	[6.31]	[-0.94]
Markup [-1, Resolution]	22.4%***	20.2%***	21.4%***	20.0%***	28.6%***	22.9%***	-6.2%**	27.9%***	24.1%***	-5.5%
	[8.65]	[7.69]	[7.93]	[7.45]	[30.25]	[30.14]	[-2.25]	[9.98]	[14.16]	[-1.44]
CAR [+2, Resolution]	7.4%***	3.6%**	7.2%***	3.2%***	3.2%***	0.4%***	4.2%*	1.4%	-0.8%	6.0%*
	[3.47]	[2.30]	[3.17]	[2.69]	[4.86]	[3.44]	[1.88]	[0.65]	[-0.07]	[1.98]
CAR [max(+2, Disclosure – 10), Resolution]	7.6%***	3.6%***	7.6%***	3.2%***	3.2%***	0.4%***	4.4%**	1.4%	-0.8%	6.2%**
	[3.83]	[2.88]	[3.58]	[3.40]	[4.86]	[3.44]	[2.11]	[0.65]	[-0.07]	[2.11]
CAR [max(+2, Disclosure – 10), Disclosure + 10]	2.0%***	1.6%***	2.2%***	1.7%***						
	[2.66]	[2.74]	[2.68]	[2.86]						

Panel D: Cumulative Abnormal Returns for Withdrawn Deals: Long Merger Targets

	Deals with activist arbitrageurs (n=40)		Deals with passive arbitrageurs (n=335)			Deals without disclosed arbitrageurs (n=115)		
	(1a)	(1b)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
	Mean	Median	Mean	Median	Diff. b/t (1a) & (2a)	Mean	Median	Diff. b/t (1a) & (3a)
Takeover premium [-54, Resolution]	13.5%*	10.6%**	14.5%***	17.3%***	-1.0%	9.3%	9.9%**	4.2%
	[1.81]	[2.15]	[4.02]	[5.09]	[-0.12]	[1.05]	[2.29]	[0.36]
Run-up [-54, -1]	6.9%	1.6%	5.9%***	3.2%***	1.0%	3.0%	4.9%**	3.9%
	[1.57]	[1.30]	[3.17]	[2.64]	[0.21]	[0.86]	[2.41]	[0.69]
Markup [-1, Resolution]	8.0%	9.8%**	9.0%***	9.8%***	-1.0%	6.7%	8.5%	1.3%
	[1.34]	[1.96]	[3.09]	[4.96]	[-0.15]	[0.91]	[1.29]	[0.14]
CAR [+2, Resolution]	-6.6%	-8.6%	-7.7%***	-4.8%***	1.1%	-11.9%*	-5.2%**	5.3%
	[-1.21]	[-1.02]	[-3.03]	[-2.79]	[0.18]	[-1.76]	[-2.06]	[0.61]
CAR [max(+2, Disclosure – 10), Resolution]	-6.4%	-6.8%	-7.7%***	-4.8%***	1.3%	-11.9%*	-5.2%**	5.5%
	[-1.36]	[-0.95]	[-3.03]	[-2.79]	[0.24]	[-1.76]	[-2.06]	[0.67]
CAR [max(+2, Disclosure – 10), Disclosure + 10]	2.0%	0.6%						
	[1.25]	[1.38]						

Table 8: Characteristics of Acquirers with and without Activist Arbitrageurs

This table reports the characteristics of the 40 acquiring companies involving activists, and compares them to the 10,194 deals with no disclosed arbitrageurs, and a matched sample of 313 deals, respectively, from 2000 to 2013. Activist arbitrageurs are identified through their Schedule 13D filings and press releases. The matched companies for each acquirer targeted by activists is assigned from the same year, same SIC three-digit industry, and same deal-size decile. *Announcement premium* is calculated as $(P_{Offer} - P_{-1})/P_{-1}$, where P_{Offer} and P_{-1} are the initial offer price and previous-day close of the target firm's stock price. *Deal value ($ million)* is the total value of consideration paid by the acquirer, excluding fees and expenses. *Return on assets* (ROA) is defined as the ratio of earnings before interest, tax, depreciation and amortization (EBITDA) scaled by lagged assets. *Revision return* is calculated as $(P_{Final} - P_{Offer})/P_{-1}$, where P_{Final} is the final deal price. *Completion rate* is the ratio of announced deals that are eventually completed. *Deal duration* is measured as the number of trading days between the first takeover announcement and the announced resolution of the deal. *Acquirer toehold* is the percentage of target shares held by the acquirer prior to the announcement. *Multiple bidders* is a dummy variable equal to one if multiple bidders compete for the target. *Friendly* is a dummy variable with a value of zero if the target company resists or receives an unsolicited offer as reported in the Securities Data Company (SDC) data base. *Defense* is a dummy variable equal to one if the target firm has used defensive tactics against acquisitions as determined by the SDC. *Tender offer* is a dummy variable equal to one if the bid takes the form of a tender offer. Finally, *Institutional ownership* is the proportion of shares held by institutional investors as reported by the Thomson Reuters Ownership Database. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Merger acquirers targeted by activist risk arbitrageurs			Difference with deal without disclosed arbitrageurs		Difference with the matched sample	
	Average	Medium	Std. Dev.	Diff. in Avg.	*t*-stat. of Diff.	Diff. in Avg.	*t*-stat. of Diff.
Deal characteristics	(1a)	(1b)	(1c)	(2a)	(2b)	(3a)	(3b)
Announcement premium (when the target is public)	26.1%	21.9%	17.3%	-1.8%	-0.45	-8.5%	-1.33
Deal value ($ million)	4,323.8	1,442.4	6,849.8	3,734.0***	3.36	4,212.9***	3.79
Return on assets (ROA)	12.8%	12.3%	9.7%	-2.6%**	-2.15	-3.4%**	-2.30
Revision return (when the target is public)	-4.3%	0	11.5%	-5.2%**	-2.23	-4.8%**	-2.04
Completion rate	60.0%	100%	49.6%	-28.5%***	-3.64	-26.9%***	-3.68
Deal duration	117.8	94.5	85.5	72.8***	4.66	64.4***	3.99
% Stock deal	35.9%	0	48.6%	27.9%***	3.58	27.9%***	3.52
% Acquirer toehold	0.3%	0	1.7%	-0.1%	-0.50	0.1%	0.52
% Multiple bidders	12.5%	0	33.5%	11.7%**	2.21	11.4%**	2.14
% Friendly	92.5%	100%	26.7%	-6.2%	-1.48	-6.4%	-1.50
% Defense	5.0%	0	22.1%	4.5%	1.28	4.4%	1.26
% Tender offer	7.5%	0	26.7%	6.1%	1.44	6.9%	1.64
Institutional holdings	46.1%	57.7%	40.5%	-2.8%	-0.44	-2.0%	-0.30

Table 9: Cumulative Abnormal Returns from Activist Arbitrage on Acquirers

This table reports CARs of acquirers held by activist arbitrageurs, and compares them to the 10,194 deals with no disclosed arbitrageurs, and a matched sample of 313 deals, respectively. *Run-up* is defined as the four-factor CAR of the acquirer's stock during the [-54, -1] trading day window relative to the date of the first bid. *Markup* is calculated as the four-factor CAR of the acquirer's stock during the [-1, resolution] window where resolution could be either effective deal completion or withdrawal. *CAR [+2, resolution]* is the CAR from the second trading day after deal announcement to resolution. *CAR [max(+2, disclosure-10), resolution]* is the CAR from the latter of ten calendar days before an activist arbitrageur's Schedule 13D filing or two days post deal announcement to deal resolution. CARs are measured by using the four-factor model with an estimation window of 255 days up to 54 days prior to announcement. In each column we report the summary statistics and the associated *t*-statistics or *z*-statistics (in brackets). *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Acquirers held by activist arbitrageurs (n=40)		Other deals (n=10,194)			Matched deals (n=313)		
	(1a)	(1b)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
	Mean	Median	Mean	Median	Diff. b/t (1a) & (2a)	Mean	Median	Diff. b/t (1a) & (3a)
Run-up [-54, -1]	-1.4%	-0.5%	-1.6%***	-1.0%***	0.2%	-2.5%*	-2.7%**	1.1%
	[-0.55]	[-0.15]	[-5.85]	[-7.96]	[0.08]	[-1.84]	[-2.23]	[0.38]
Markup [-1, Resolution]	0.5%	-1.6%	-1.4%***	-0.1%***	1.9%	0.3%	-0.2%	0.2%
	[0.09]	[-0.71]	[-6.30]	[-4.15]	[0.36]	[0.21]	[-0.01]	[0.04]
CAR [+2, Resolution]	6.5%	1.6%	-3.0%***	-1.0%***	9.5%	-0.4%	-0.7%	6.9%
	[1.29]	[1.18]	[-9.60]	[-10.03]	[1.89]	[-0.18]	[-0.81]	[1.26]
CAR [max(+2, Disclosure – 10),	8.4%	3.6%	-3.0%***	-1.0%***	11.4%	-0.4%	-0.7%	8.8%
Resolution]	[1.50]	[1.61]	[-9.60]	[-10.03]	[2.04]	[-0.18]	[-0.81]	[1.47]
CAR [max(+2, Disclosure – 10),	2.3%*	1.3%						
Disclosure + 10]	[1.69]	[1.37]						

Appendix: Examples of Activist Risk Arbitrage

A. Appraisal Arbitrage

Global GT LP, Global FT Ltd. and Golden Telecom, Inc.

In December 2007, Golden Telecom, Inc. ("Golden"), a Russian-based telecommunications company listed on the NASDAQ, agreed to be acquired by Vimpel-Communcations ("VimpelCom") for $105 per share in cash. VimpelCom was a major provider of mobile telephone services in Russia, whose two largest shareholders (who combined owned 77.6%) were also major holders of Golden (44.3%).

Two investors, Global GT LP and Global FT Ltd. ("Global"), who collectively held 1.37 million shares (3.4%) of Golden common stock, withheld their votes and then sought appraisal of their shares in the Delaware Court of Chancery a few months after the transaction closed. Relying on a discounted cash flow ("DCF") analysis, the dissenting shareholders claimed that each share should be worth $139 as of the merger date. However, the company, now a wholly-owned subsidiary of VimpelCom, contended that the value should be a mere $88 per share using a similar DCF approach.

Based on an independent DCF analysis, a Delaware Chancery judge ruled on April 23, 2010 that Golden was worth $125.49 per share, supplemented with an award of interest at the legal rate (5% over the Federal Discount Rate, compounded quarterly) from the merger closing date. In arriving at his own valuation, the judge rejected the assumption that the merger price was market-tested due to the "inherent coercion" in an offer endorsed by the targets' largest shareholders. The judge adopted an equity risk premium and a terminal growth rate that were close to the estimates provided by the expert representing Global.

Including interest accrued from February 2008, the appraisal brought a 37.0% premium over the merger price, or an annualized return of 15.0%.

B: Activist Risk Arbitrage in Acquirers

JANA Partners LLC and Charles River Laboratories International, Inc.

On April 26, 2010, Charles River Laboratories International, Inc. ("Charles River"), a U.S. drug research firm, agreed to buy WuXi PharmaTech Inc. ("WuXi"), a Chinese rival, in a cash and stock transaction valued at approximately $1.6 billion or $21.3 per share, a premium of 28.2% over WuXi's pre-announcement price. Charles River's stock dropped to $33.55 that day, a decline of 15.7%, reflecting investors' dissatisfaction with the deal, although part of the decline was due to a somewhat weak earnings release issued on the same day. On June 7, 2010, JANA Partners LLC reported a 7.0% stake in Charles River in a Schedule 13D filing, disclosing its intention to vote against the issuance of shares to complete the transaction. The company's stock jumped nearly 4.0% upon the disclosure. JANA believed the proposed price of 16x EBITDA, compared to 8x for Charles River, was not justified given WuXi's declining margins and slowing growth.

On June 14, 2010, Charles River sent a letter to JANA, explaining that the acquisition would create value for its shareholders because of WuXi's high growth rate. On June 16, JANA replied, arguing that because the acquisition lacked synergies, Charles River stockholders could invest in WuXi directly without paying a control premium, if they believed in the growth story. Then on June 17, Neuberger Berman LLC, a 6.3% holder in Charles River, disclosed its opposition to the acquisition. On June 18, Relational Investors LLC, a 4.0% owner, did the same. Charles River closed at $36.85, up 3.7% from two days ago.

In a July 16 letter to Charles River's board, JANA pointed out that the company could increase shareholder value by repurchasing shares or selling the company or certain assets. On July 26, Institutional Shareholder Services, Inc. and Glass Lewis, two leading proxy advisory firms, recommended that Charles River shareholders reject the proposed combination. The stock jumped 2.5%, following the news.

On July 29, 2010, Charles River terminated its acquisition agreement with WuXi in response to shareholders' concerns, requiring it to pay WuXi a break-up fee of $30 million. Charles River also announced a new $500 million stock repurchase program. The stock closed at $31.95. Although Charles River's investors had lost 4.8% since the announcement, it stock performance had far exceeded the S&P 500 index, which suffered a decline of 8.4% during the same period.