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"Influencing Control: Jawboning in Risk Arbitrage"

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Influencing Control: Jawboning in Risk Arbitrage[*]

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Abstract

In an "activist risk arbitrage," a shareholder attempts to change the course of an announced M&A deal through public campaigns, and profits from improved terms. Compared to conventional (passive) risk arbitrageurs, activists target deals susceptible to managerial conflicts of interest (e.g., going-private and "friendly" deals) and deals with lower announcement premiums. Their presence increases the sensitivity of deal completion to market signals. While they block a significant proportion of planned deals, activist arbitrageurs only modestly decrease the probability that the targets will eventually be acquired (including by a third party). Finally, the strategy yields significantly higher returns than passive arbitrage.

Key Words: Activist Risk Arbitrage; M&A.

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, the existing shareholders stood to gain a premium of 26.2% over the pre-announcement price. The special meeting to approve the merger was scheduled for May 20, 2013. 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 industry performance following the merger agreement.

By then a "wolf pack," a group of informally-coordinated investors, appeared to have formed to oppose the merger. 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. John Paulson, another hedge fund manager, was the largest outside shareholder (9.9%) at the time but he 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 recommended voting against the transaction on the following day. At the special meeting on May 20, FCX allowed PXP to declare a special one-time dividend of $3 per share prior to merger consummation, and promised supplemental dividends post-merger. Paulson immediately pledged his shares in favor of the deal, and the merger proposal passed at 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%.

This story is reminiscent of an "M&A arbitrage" or "risk arbitrage" strategy by speculators, but it 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

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[1]The representative work in this 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), Hsieh and Walkling (2005), and Cao, Goldie, Liang, and Petrasek (2015).

strategy employed by CR Intrinsic. Although target stock price generally increases after deal announcement, in most cases it remains below the final purchase price due to risks that the deal may fail. The passive arbitrageur then votes his shares in favor of the merger and hopes to profit from full price convergence at deal consummation. During this process the speculator does not "voice" his opinion other than voting his shares. In fact, the passive arbitrageur avoids engaging the management so as not to compromise his freedom to trade under insider trading rules.

At this point CR Intrinsic diverged from the typical route of a risk arbitrage. It 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%. Its incremental cost was the time/effort spent in jawboning, in writing and disseminating public letters, and that from an increased risk that the deal would completely fall through, after which the price could go back to its pre-announcement level.

The CR Intrinsic/PXP case is no longer an exception. Such activist arbitrage activities have been on the rise since the early 2000s: they were observed in 0.6% of all M&A deals in 2000, compared to 13% and 6.5% of all such deals in 2013 and 2014, respectively. 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. As shareholder activism launched by institutional 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 inserting shareholder activism into corporate control events, bridges the two by "influencing control."

Our study builds on three disjoint subsamples covering all 4,278 M&A deals between 2000 and 2014. The most important of the three is the event sample or the "activist arbitrage

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[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.

sample," a manually composed sample of 343 events where there was observed jawboning by outside blockholders after the initial announcement of an acquisition. Next in importance is the conditional control sample or the "passive-only arbitrage sample" consisting of 2,549 deals involving disclosed passive risk arbitrageurs but without activism. The final subsample is the unconditional control sample or the "no-arbitrage sample," which includes the 881 deals that are left over. The construction of both control samples follow the standard procedure used in the literature.

Our analyses reveal both similarities and dissimilarities between the two forms of risk arbitrage. On the one hand, both types of arbitrageurs prefer larger deals and target companies with higher institutional ownership. 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).[3] Moreover, the best predictor for an arbitrageur to be an activist rather than remaining passive is a relatively low announcement premium (controlling for deal characteristics). Finally, activists are more likely to disturb otherwise "friendly" deals. Presumably 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 to other forms of managerial conflict of interest.

As expected, activist arbitrageurs earn higher average returns on their investment 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 annualized average return accrued to activist arbitrageurs is 16.3% from post-deal announcement to resolution. In an efficient market, any abnormal return in trading has to come from some form of "private information," the return spread between the activist and passive strategies should be no exception. 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 voting decision, which in turn increases the value of the shares by

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[3]The acquirers in M&A deals that do not result in the target company going private are more likely to be other companies strategically aiming for synergies or better market positioning.

raising the probability of a favorable vote outcome (deal completion).[4] Applying the same framework to an activist risk arbitrageur on the target side, her information advantage lies in the fact she is privately informed about her intention (and her confidence in her own ability) to push up target's stock price, which creates more room than a passive-only risk arbitrage for the return spread.[5]

By threatening to block an announced deal in order to extract a higher price from the current or potential buyers, activist arbitrageurs stand ready to assume a higher deal failure risk than passive arbitrageurs who simply vote their shares in favor of the deal. To the extent that activists, like passive risk arbitrageurs, are better off with completed than withdrawn deals ex post, they have an incentive to pick deals with low "inherent" deal failure risk, e.g., deals in which the targets (and/or acquirers) are determined to sell (and/or buy), such that a tough negotiation is more likely to lead to improved terms for the shareholders rather than a withdrawal. Such a selection effect is borne out in data. While the average deal completion rate of the activist arbitrage subsample is a modest 2.9 - 3.5 percentage points lower than that of the complement subsample, the impact of activists on the deal completion rate is estimated to be 14.6 - 17.5 percentage points lower once the unobserved heterogeneity in deal failure risk is accounted for. Relatedly, a duration analysis indicates that activists do not noticeably slow down the process toward deal resolution.

More importantly, activist arbitrage significantly increases the sensitivity of deal completion to ex ante completion probability, where the latter is proxied by the proportion of price convergence toward the offered premium during the announcement window. Therefore, activist arbitrageurs are not only sophisticated in picking deals for which there is more room for improvement and deals with high ex ante probability of completion, but they also increase (decrease) the completion rate of deals that are welcomed (unfavored) by the market. Such a combination suggests a sustainable equilibrium in which activists do well for themselves while doing good for the shareholders in M&A targets.

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[4]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 true value. For a more detailed discussion, please see Bradley, Brav, Goldstein, and Jiang (2010).

[5]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 the activist arbitrage discussed in this study.

For completeness, we also study the 47 deals during the same sample period where activists intervene on the acquirer side after an M&A announcement.[6] The prime candidates for such interventions are stock deals with multiple bidders, common conditions identified by the M&A literature to be associated with over-pay and agency problems in general (Fuller, Netter, and Stegenoller, 2002; Harford and Li, 2007; Fu, Lin, and Officer, 2013). Activists succeed in slashing the paid premium or blocking the acquisition altogether: premiums paid to targets are lowered by 7%, and the deal completion rate is cut by 36 - 37 percentage points. To the extent that a large number of acquisitions of public targets seem to be value destructive for acquirer shareholders, especially when compounded with weak governance (Moeller, Schlingemann, and Stulz, 2005; Masulis, Wang, and Xie, 2007), activist arbitrageurs on the acquirer side constitute a powerful counterbalance. Thus, activist arbitrageurs have incentives to defend shareholder interest on both the target and acquirer sides of proposed M&A deals.

Our paper is related to, but distinct from, a recent study by Boyson, Gantchev, and Shivdasani (2015), which analyzes how hedge fund activists propose and facilitate acquisition activities at the firms they intervene in. In their setting, activists play a positive role by increasing the odds that the target firms will receive takeover bids. In contrast, our study analyzes how activists alter the course of existing M&A deals that were initiated and announced by management in order to make them more favorable to shareholders. The two papers do not overlap in either the time line (before vs. after M&A formation) or the sample deals (promoted vs. dissented by the activists). The two studies taken together, however, form a comprehensive picture on how "influence-based" shareholder activism is reshaping the market for corporate control.

2 Data Sources 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, 2014, is constructed using information from the Securities Data Company

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[6]It is worth noting that there is no overlap between the deals with activists on the target side and those with activists on the acquirer side. Our later analysis shows that the deals in the two samples are quite different in nature.

("SDC") database. We include all attempted acquisitions, regardless of whether they are consummated or not, applying 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. SDC's definition of payment form is different from those specified in the merger agreements for certain deals, especially those labeled by SDC as "Unknown" and "Other." To correct these misclassifications, 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,[7] 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 the Factiva news archive 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 2015. These criteria result in a sample of 4,278 deals. Data on the deal announcement date, effective date, withdrawal date, deal premium, and characteristics of the target and acquirer are collected from 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 two basic categories and construct the samples accordingly: Activist risk arbitrage in targets and that in

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[7]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.

acquirers. There are 302 deals in total.

In a related strategy, activist arbitrageurs purchase stocks in a merger target to exercise their appraisal rights, which allows dissenting shareholders to seek value they deem "fair" from a court rather than to accept the merger consideration. There were 323 appraisal appeals against public companies filed in the Delaware Court of Chancery from 2000 - 2014. An appraisal arbitrage may well represent an activist's "last resort" after he failed to convince the majority of shareholders to improve or to block the deal. However, there is a critical difference in that the gain from a successful appraisal arbitrage accrues only to the dissenters who withheld their votes, and is not shared by other shareholders. Hence, support from other shareholders is not necessary for appraisal petitioners. Due to this difference, appraisal arbitrage in more recent years has evolved into a standalone litigation-based investment strategy by a specialized group of investors (e.g., Merion Capital) with little overlap with the group of activist investors in our sample (Korsmo and Myers, 2014). For the purpose of this study, we do not include appraisal petitions which are not accompanied by activist campaigns aiming at improving acquisition terms for all shareholders.

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

This is the most important category and accounts for 84.4% of our sample of activist arbitrage events, including the case outlined in the Introduction. A defining feature of all the cases in this category is that the arbitrageurs, who hold sizable but strictly minority equity stakes in target companies after deal announcements, launch public campaigns (ranging from shareholder proposals to proxy contests) in order to block the proposed takeover; and, in most cases, to extract better terms from the acquirers. A successful endeavor presumably benefits all shareholders of the targets. Figure 1 illustrates the typical path of an activist arbitrage in a merger target from deal announcement to resolution, juxtaposed with that of a conventional passive arbitrage.

[Insert Figure 1 here.]

The primary data source to identify all such events is SharkRepellent – a data provider specializing in corporate governance – which identifies 230 merger targets with activist campaigns (318 deal-activist pairs) during the period from 2000 to 2014 under a specialized

category named "Vote/Activism Against a Merger."[8] For each target firm, we identify the activist arbitrageurs as investors who publicly criticized the transaction or solicited proxies against the deal. Of the 270 unique investors, 222 are hedge funds, 14 are other institutional investors, 13 are companies, and the remaining 21 are individuals.[9] 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.

Additional steps ensure sample completeness. First, we manually collect all Schedule 13D filings between deal announcement and resolution for all mergers announced between 2000 and 2014. Second, a filing entity is classified as an activist arbitrageur if it satisfies either of the following two criteria: (1) It states under Item 4 that the purpose of its investment was to object to the current structure of the acquisition, or to propose different terms for the deal.[10] (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 additional Schedule 13D search increases the total number of merger targets with activist campaigns to 255.

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

Following the same procedure as that outlined in the previous section, we further identify 47 acquirers targeted by activist arbitrageurs during the same period. Appendix A presents an example. In most cases, the activists portray an announced deal as overpaying or as deficient in due diligence, and they 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

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[8]SharkRepellent gathers and aggregates information from regulatory filings (such Company 8-K, merger agreements, Form 14A, and Schedule 13D) and press releases.

[9]Individual activists in our sample include Lloyd Miller III, a prominent independent investor, and Ralph Nader, mostly known as a consumer advocate and a former presidential candidate.

[10]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.

profit from value improvement rather than from spread convergence.

Common to both categories of events is that the arbitrageurs campaign against the deals in their current form. A comprehensive search of Schedule 13D filings and news stories using Factiva would also yield cases in which investors buy shares in order to vote in favor of the deal, and they sometimes even publicly promote the deal in order to influence other shareholders. We exclude such "affirmative" actions from our sample of activist actions aiming at upsetting the deals. On the other hand, 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 and acquirer sides require different data inputs and address different research questions. Most of our empirical analyses focus on the target side, with the exception of Section 6 which is devoted to activism on the acquirer side.

2.2.2 Sample overview

1. *Activities and players*

Figure 2 plots the frequency of merger transactions and activist arbitrage activities on the target side 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, Appendix B lists the top players in our sample that invested in at least four merger targets. The top four are GAMCO Investors, Inc., Ramius LLC, Millennium Management LLC, and Elliott Associates, LP, and combined they account for 10.6% of all the deals. It is worth noting that though activist and passive arbitrageurs mostly operate in different strategy spaces, there is some overlap of the players. About 14.9% of the passive arbitrageurs in our sample launched at least one activist campaigns.

2. *Ownership and investment horizon*

Table 1 reports the size of activist arbitrageurs' stakes in merger targets at their disclosure as well as the duration of their investment horizon. The median initial (maximum over the event) percentage stake that activist arbitrageurs take in the merger target is 7.0% (8.9%), and the median dollar investment is $25.3 ($29.4) million. The level of ownership

is comparable to the full sample of hedge fund activism reported in Brav, Jiang, Partnoy, and Thomas (2008), but it is substantially higher than the typical stake held by passive arbitrageurs (for which the median is 0.65% in our sample).

[Insert Table 1 here.]

Regarding investment horizons, Table 1 shows that the median duration between deal announcement and initial disclosure of activist arbitrageur holdings is 25 calendar days, with an interquartile range of 6 to 64 days. The relatively 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 83 days, affording activist arbitrageurs plenty of time to influence completion as well as the terms of the merger.

3. *Activist arbitrage tactics and outcomes*

Because activist arbitrageurs do not hold controlling blocks, they can only implement changes in a deal via influence on the board or fellow shareholders. Almost all (249 out of the 255) merger targets required the approval of a majority of shares outstanding (nine such deals require the approval of a two-thirds supermajority). The remaining six deals require the approval of a majority of shares voted (counting abstention shares). Given that the average (median) approval rate in our sample is 65.1% (66.8%), the votes directly commanded by the activist arbitrageurs' are not necessarily pivotal. Hence persuasion to win fellow shareholder support is crucial.

The most common "influence"-based tactics include: (1) Public criticism of the transaction through letters addressed to the target's board and/or shareholders, usually accompanied by press releases (148 deals). The same letters are often attached to Schedule 13D filings under Item 4 (157 deals). (2) Proxy solicitation intended to veto the deal (49 deals, 23 of which involve proxy contests). (3) Proposing alternative acquisitions (11 deals). (4) Lobbying proxy advisory firms like ISS in order to influence their institutional shareholder clients. For our sample transactions, 84 voting recommendations issued by ISS were disclosed,[11] with an overall support rate of 69.0% in favor of the dissidents. This implies that

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[11]Activists sometimes attach their presentations to the proxy advisory firms in their filings and/or press

unconditionally ISS supported the dissidents 31.0% of the times. Such a rate is impressive given that ISS's approval is almost automatic at a 98.7% rate in the absence of a dissention.[12] These tactics are similar to those documented in the general hedge fund activism literature, except with a more targeted effort in influencing shareholder votes.

"Wolf packs," i.e., informally coordinated investors [13] teaming up in the same target firm supporting a common agenda, is a common tactic in activist arbitrage. In 23.5% of our activist sample deals, we are able to identify at least two publicly announced activists. They usually disclose their intentions only a short time window apart, ranging from several days to a few weeks. And in most such cases the "follower" explicitly support the claims by the "leader" that the deal terms were unfair to shareholders. The percentage is likely to underestimate the presence of "wolf packs" because the coordination may not be disclosed, or may even just take the form of mutually-consistent beliefs as analyzed in Brav, Dasgupta, and Mathews (2015).

Out of the 255 deals involving activists, only 123 (or 48.2%) are completed under their original terms. In 78 deals (or 30.6%) target shareholders gained better terms from either the original or new acquirers, and the rest were withdrawn either by the acquirers or the targets. In contrast, 75.7% of the deals without activists were completed under the originally stated terms.

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

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releases. ISS issues a voting recommendation when enough of its fund clients hold the merger target. In many cases, ISS's recommendation is disclosed by either the activist or the merger target. Since the party with ISS support has the incentive to disclose the recommendation, we believe our data collection was comprehensive. Moreover, in all activist-involved cases, ISS issued recommendations after activist announcement, with a median delay of 48 days.

[12]This is calculated based on 521 mergers without activist presence in ISS's Voting Analytics database during 2003-2011.

[13]The coordination is informal in the sense that it does not rise to the level of a "legal" group that requires joint filings.

passive arbitrageurs, we follow the methodology developed by Hsieh and Walkling (2005), using the Thomson Reuters 13F institutional ownership information.

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 644 deals, and reduces our sample to 3,634 deals. This step ensures that we can calculate the change in institutional ownership around the deal announcement. Second, we require that an arbitrageur have a positive change in stock ownership for at least six 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. Though the two numerical cutoffs are arbitrary, robustness checks confirm that our main results are not affected by the specific choices within a reasonable range.

The above steps identify 268 unique passive risk arbitrageurs between 2000 and 2014. We then proceed to identify deals that involve passive arbitrageurs but are without activists' involvement. The double criteria yield 2,314 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 2014. The filer is added to the list of passive arbitrageurs if it meets the following two criteria: First, the filing investor does not state under 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 235 unique M&A events with passive risk arbitrageurs.

Out of the total of 3,634 M&A deals, our final sample ends up with 204 deals targeted by activist arbitrageurs, 2,549 deals involving passive-only arbitrageurs, and 881 deals with no disclosed arbitrageurs. Sorted by forms of payments, 2,160 are cash offers, 804 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

Our first analysis examines the characteristics of merger targets that attract activist arbitrageurs. The first column of Table 2 reports characteristics of merger targets held by

activist arbitrageurs. 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 with targets in deals involving no disclosed arbitrageurs.

[Insert Table 2 here.]

Panel A compares ex ante deal characteristics between the activist arbitrage subsample and two subsamples involving passive-only arbitrageurs or no arbitrageurs at all. Deals held by activist arbitrageurs, on average, have an announcement premium of 18.9%, compared to a 32.7% premium for deals involving passive arbitrageurs (t-statistic for the difference equals –7.6), and a 37.4% premium for those without disclosed arbitrageurs (t-statistic for the difference equals –8.0). The significant difference in the announcement premium, defined as $(P_{\text{Initial Offer}} - P_{-1})/P_{-1}$, where $P_{\text{Initial Offer}}$ and P_{-1} are the initial offer price and the close price of the target stock on the day prior to the announcement, suggests that activist arbitrageurs are "bargain hunters:" They tend to target deals with lower announcement premiums after controlling for other deal characteristics, which presumably have more room for a sweetened bid if the low bid is due to a conflict of interest or a lack of bargaining effort on the target side. Relatedly, activists are thus 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 perceived synergies (e.g., Bargeron, Schlingemann, Stulz, and Zutter, 2008).

Deals involving activist arbitrageurs are less likely to have defensive tactics against takeovers, such as a shareholder rights plan. Thus, activists prefer targets in which it is easier for them to build up their stakes if needed. Activist arbitrageurs also tend to target deals with higher institutional holdings, compared to deals involving passive arbitrageurs and especially compared to deals without any disclosed arbitrageurs. This is consistent with a key finding of Bradley, Brav, Goldstein, and Jiang (2010) who analyze activists endeavoring to open up closed-end funds. Higher institutional ownership indicates the sophistication of target's shareholder base is attractive to activist arbitrageurs. As minority stockholders, activists need the support of other institutional investors in order to accomplish their goals while avoiding the voting apathy that is typical of retail investors (Black,1990; Harris, 2010).

Panel B compares key ex post deal outcomes. Deals involving activist arbitrageurs on average have a higher revision return, which is the increase in the acquirer's bid scaled by target 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 a 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. Such a tactic is reflected in the significantly (at the 1% level) higher probability of multiple bidders (at 27%, which is 20.3% and 14.9% higher than the passive-only and no-arbitrage subsamples, respectively). In fact, of the 55 multiple-bidder deals targeted by activist arbitrageurs, 69.1% of them engaged new bidders (including those proposed by the activists) only *after* the arbitrageurs initiated their proposals.

Apparently, activists accomplish higher expected revision return by credibly threatening to veto marginal deals using their own shares and their influence over other shareholders, imposing pressure on both the target and acquirer boards. The average completion rate of the deals involving activists, at 72.5%, represents a 14.6% (6.5%) drop from the level seen in the passive-arbitrage (no-arbitrage) subsample.

3.2 Determinants of Activist Arbitrageurs' Participation

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

Panel A of Table 3 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 their associated marginal probabilities) representing the marginal effect of each regressor 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 2 with the critical difference that all variables in the regressions are measured at the time of M&A deal announcement.

[Insert Table 3 here.]

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Most importantly, and consistent with results in Table 2, *Announcement premium*, other things equal, has a significantly (at the 1% level) negative impact on the likelihood of an activist arbitrage. A one-standard deviation increase in the announcement premium is associated with a decrease in the marginal probability of 4.1%. Relative to the unconditional probability for the presence of activist arbitrageurs of 6.0%, the incremental probability is remarkable. Such a relation indicates that activist arbitrageurs seek to identify deals with low initial premiums, especially when the low premium is compounded 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 three more deal characteristics support the conflict of interest hypothesis. Activist arbitrageurs are 4.1 percentage points more likely to emerge in *Going-private* deals (25.9% of all transactions), usually financed by financial, rather than strategic, sponsors; 4.0 percentage points more likely to intervene in a *friendly* deal (93.3% of all transactions), and 1.5 basis points more likely to dissent for every one percentage point increase in insider ownership. The first two effects are significant at the 1% level while the third is significant at the 10% level. In a regression framework, such effects are net of those from 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, because in such deals a controlling (or major) shareholder or a current insider is usually a member of the buyer group. Thus, this insider ownership interest gives the prospective buyer the power to influence 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. These coefficients thus exemplify the corporate governance element in the activist arbitrageur strategy.

The coefficient for *Institutional ownership* implies that a one-standard deviation increase in institutional holdings is associated with an increase in the marginal probability of 1.7% (significant at the 1% level), supporting the necessity of activists to secure the support of

institutional investors and to avoid the "apathy" of retail and small investors.[14] *Deal value* positively predicts the presence of activist arbitrageurs, and the coefficient is statistically significant at the 1% level. However, the economic magnitude of the marginal probability is modest. In addition, *Acquirer toehold* is also positively related to activist arbitrage. The effect of acquirer toeholds is consistent with Betton and Eckbo's (2000) finding that higher toeholds are associated with terms less favorable to the target, such as lower offered premiums. Further, *Target-acquirer same industry*[15] and *ROA* are not significant predictors for the emergence of activist arbitrage, suggesting that activist arbitrageurs focus more on the payment terms rather than on the performance of the target or the potential synergies.

Column (2) of Table 3, Panel A reports the determinants of passive arbitrage, using the same estimation procedure, 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, are endorsed by the target firm's board, and entail a larger acquirer toehold and a higher level of insider ownership. All these coefficient estimates are significantly and positively associated with deal completion—hence a passive arbitrage strategy is likely to be associated with 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 spread convergence upon deal completion rather than value improvement.[16]

3.2.2 Determinants of activist participation conditional on arbitrageur presence

The conditional analysis assesses the determinants of activism conditional on the participation of any type of risk arbitrageurs. Column (1) of Panel B, Table 3 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

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[14]The effect remains robust if we exclude activist holdings from *Institutional ownership*, suggesting that wooing other institutional shareholders is an important tactic of the activists.

[15]Results are similar if we resort to the Hoberg and Phillips (2010) network industry classifications.

[16]To the extent that merger targets' corporate governance quality may also affect activist arbitrageurs' participation decision, we further control for the "entrenchment index," proposed by Bebchuk, Cohen, and Ferrell (2009) on a subsample where the index is available. The results remain largely similar (not tabulated) while the entrenchment index per se is not significant.

determinants from the unconditional analysis remain significant (at the 1% level): a one-standard deviation increase in announcement premium is associated with a 4.2% decrease in the marginal probability of being targeted by activists, and going-private deals are 5.2 percentage points more likely to invite activists. The consistency between the unconditional and conditional relations reaffirms the strong corporate governance motivation underlying activist arbitrageurs. *Stock deal* has a negative effect with marginal significance, possibly due to the fact that such deals are not eligible for appraisals, a potential last resort for an activist to demand a higher value after the failure of public activism.

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 uniform within this group. In this subsample we find that the results on other determinants from both unconditional and conditional analyses are nearly identical to those in Table 3.

Results in column (1) of Panel B, Table 3 reveal differences between activist and passive risk arbitrage, but they do not tell us whether these differences are due to activism or to different investor styles because the two groups of funds do not fully overlap. To disentangle these two effects, we restrict our sample to investors who engage in both activist and passive arbitrage, resulting in a sample involving 120 unique funds. We then repeat the same regression as in column (1) except adopting a linear probability model with fund fixed effects. Column (2) of Panel B reports the results, which suggest that a given arbitrageur is more likely to turn activist on going-private and friendly deals with lower premium. In addition, activists prefer larger deals and cash transactions.

4 Deal Resolution: Completion Rates and Duration to Completion

4.1 Deal resolution and activist arbitrage

4.1.1 Deal completion rates

Whether arbitrageurs' campaigns heighten deal risk reflects a curious trade-off. On one hand, these sophisticated investors can push the target board to reject inadequate offers and

to seek higher bids; on the other hand, activist arbitrageurs' involvement could cause delays due to extended negotiations or even withdrawals if the expectation of higher premium drives potential suitors away. "Deal completion" could be measured in two ways in this context. By default, we classify a deal as "completed" if the target is sold to the buyer pursuant to the announcement, including under altered terms. In sensitivity analysis, we adopt an alternative measure to also include in "completed deals" targets that are eventually sold to another buyer within one year from the original announcement. The first approach assesses to which extent activists uproot the original deal; while the alternative measure takes into consideration that target shareholder returns are determined by deal duration and eventual price terms, which are not necessarily tied to a particular acquirer.

To start with, Panel A of Table 4 reports probit regressions of deal completion (in two definitions) with activist involvement as a key predictive variable. Results show that deals targeted by activist arbitrageurs, other things being equal, are 3.5 percentage points less likely to be consummated with the current buyer. The effect is economically modest, relative to the all-sample completion rate of 84.9% (significant at the 10% level). This difference is notably lower than that reported in Panel B of Table 2 (without controls), suggesting that activists are more likely to target deals that have lower probability of completion based on observable characteristics, such as going-private transactions and low-premium deals, which naturally encounter greater resistance from shareholders.

Under the alternative definition of deal completion (by any buyer), the marginal effect is somewhat lowered to –2.9%, which is not statistically significant. The fact that activist involvement does not seem to be associated with a significantly lower rate of eventual sale could be due to activists' tendency to put the targets "in play" which increases the probability of their being sold (Greenwood and Schor, 2009; Boyson, Gantchev, and Shivdasani, 2015), even if not to the current bidder. Consistent with the existing literature, we also find that friendly deals (Walkling, 1985; Hsieh and Walkling, 2005) and tender offers (Betton, Eckbo, and Thorburn, 2008) are more likely to be consummated, and that the use of defense tactics is associated with lowered deal success rates (Field and Karpoff, 2002).

[Insert Table 4 here.]

4.1.2 Deal duration

In addition to affecting the probability of eventual deal completion, activist campaigns could cause delays in the merger process, imposing higher costs for shareholders. To assess the extent of such a cost, Panel B of Table 4 reports results connecting the duration of the merger to activist involvement. In column (1), the dependent variable is the logarithm of the number of days between announcement and resolution of the current deal, where the resolution date could be either completion or withdrawal. The key independent variable is the dummy variable *Activist arbitrage*, and all other covariates are identical to those in Panel A. The duration of a deal involving activists on average takes 7.2% (equivalent to 10 days for an average deal) longer than those without, but the difference is not statistically significant. 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.

As discussed earlier, an eventual sale of the company to any buyer may be just as important for shareholders. In column (3) of Panel B, the dependent variable is modified for the 80 deals that were withdrawn from the original agreement but where the targets were successfully sold within one year to a third party. For those deals, deal duration becomes the number of days between deal announcement and the effective date of eventual sale. The coefficient on *Activist arbitrage* indicates that activists' involvement lengthens deal duration by 6.0%, but the effect is not significant, either.

The Cox (1972) proportional hazards model,[17] reported in columns (2) and (4) of Panel B, Table 4, yields qualitatively similar results. The estimated hazard ratio (it is equal to the exponentiated coefficient) associated with the dummy variable *Activist arbitrage* implies that, conditional on a deal being in process, the probability of a current (any) deal closure on a given day is about 17% (14%) lower if the deal attracts an activist arbitrageur. The coefficient estimates are significant at the 10% level. Overall the involvement of activists marginally (both economically and statistically) delay the deal from proceeding to closure.

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[17]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.

4.1.3 Completion rates and market signals

As discussed, a necessary component in the activist arbitrage strategy is a credible threat (reflected in ex post outcomes) to block some deals. It remains to be shown what types of marginal deals activists choose to impede. For believers in market efficiency, the desirability of a deal for target shareholders could be gleaned from stock market response during the announcement window. We thus relate actual deal completion rate to a proxy for the ex ante completion rate, *Ex ante completion probability*, defined as $(P_{+1} - P_{-1})/(P_{\text{Initial Offer}} - P_{-1})$, in which P_{-1} and P_{+1} denote the target's stock price one day before and after the deal announcement, respectively.[18] This measure is similar to those used in Brown and Raymond (1986) and Larcker and Lys (1987), and captures the intuition that the convergence rate of target's post-announcement price to the offered price reflects rational traders' expectation of price resolution and duration of the deal (Jindra and Walkling, 2003). 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.

As expected, *Ex ante completion probability* positively predicts deal success: a one-standard deviation increase in this measure leads to a 3.5 percentage-point increase in success for an average deal (significant at the 1% level). Moreover, a simple comparison shows that the ex ante completion probability for deals targeted by activists, at 72.6%, is 0.2 percentage points higher than that of the control sample, and this difference is statistically insignificant (t-statistic = 0.08). This suggests that activist arbitrageurs do not appear to target deals that are perceived by the market to have a higher or lower likelihood of completion.[19]

The most important result concerns how the relationship between ex ante and ex post deal completion rates differs between deals involving activist arbitrageurs and the other deals. Panel C of Table 4 applies probit regressions separately on the activist and non-activist subsamples, including the same covariates as those in Panel A with the addition of *Ex ante completion probability*. We observe a sizable difference in the coefficients between

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[18]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.

[19]The lack of difference also suggests that the stock market and the passive arbitrageurs do not seem to be able to predict the emergence of activists beyond the observable characteristics at the time of deal announcement; otherwise speculators should bid up the target stock price, leading to a tightened spread convergence, on the prospective activist targets.

these two samples: a one percentage-point increase in ex ante completion probability leads to a 34.3 basis-point increase in the consummation of deals involving activists, as opposed to a 9.3 basis-point increase for deals involving no activists. The two-sample t-test for the two coefficient estimates rejects the null hypothesis that they are equal at the 5% significance level.

In summary, although their presence is associated with a modest increase in deal failure risk, activist arbitrageurs also make deal success more (less) likely when it is anticipated (not welcomed) by the market. The theoretical work by Edmans, Goldstein, and Jiang (2015) and the 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 who make management more receptive to the cues from market prices.

4.2 Deal completion: Selection and treatment effects

While both activist and passive risk arbitrageurs profit from deal consummation and hence have the incentive to select deals with best prospects of completion, their "treatment effects" are distinct. Passive arbitrageurs' actions (i.e., consolidating share ownership and casting positive votes) work to further improve the deal success rate in order to maximize their returns from spread convergence (Cornelli and Li, 2002; Cao, Goldie, Liang, and Petrasek, 2015). In contrast, activists' strategy requires that they block some low-premium deals in order to extract higher payments from acquirers on the rest. This nature of activist arbitrage thus implies a "corrective" selection bias, that is, because the selection effect and treatment effect work in opposite directions, its effect on deal completion is likely to be under-estimated in a reduced-form regression like the ones in Panel A of Table 4.

4.2.1 Separating selection and treatment effects: An instrumental variable approach

A separation of the treatment effect from the selection effect requires an instrumental variable that affects activists' participation after an M&A deal announcement, but it should not affect deal completion other than through activist campaigns. The instrument of our choice is the net-asset-value (NAV) returns of activist hedge funds prior to an M&A an-

nouncement. More specifically, we construct the variable *Prior excess return of activist funds* as follows. First, we capture the "universe" of activist arbitrageurs during the sample period by matching all the activist funds that appear in our sample to two major hedge fund databases, Lipper TASS and CISDM (both accessible via WRDS), resulting in 74 matched funds. Second, we construct a value-weighted monthly return series in excess of the CRSP value-weighted returns. Lastly, for each M&A observation in our sample, we impute the returns to these activist funds during the [t-6, t-1] month window. Because it is tied to specific event months, the excess return variable captures cross-sectional variations in activists' recent-past success at the time of M&A announcements. The resulting variable has a mean (median) return of 4.3% (4.6%) and a standard deviation of 4.5%.

We then run a bivariate probit model consisting of two simultaneous equations for discrete outcomes: one for deal completion and the other for activist participation. The results are reported in Panel A of Table 5. The endogenous variable in the *Deal completion* equation is *Activist arbitrage*, and *Prior excess return of activist funds* is excluded in this equation. The validity of *Prior excess return of activist funds* as an instrument for activist participation, or its "exclusion restriction," relies on the fact that this variable captures independent factors from the activist capital supply side rather than circumstances in the M&A market.[20]

Several properties of the measure, as well as the setting, are helpful. First, unlike activist interventions in companies, the timing of a risk arbitrage is not a choice made by the hedge fund because the window of opportunity is a short one right after an M&A announcement. Second, the lagged NAV return is a retrospective measure for the appreciation of assets held by the funds in the past, which does not embed market valuation or expectation of the hedge fund's future success. Third, the excess return measure is close to being temporally uncorrelated (as it should be in a relatively efficient market). Empirically, the temporal correlation 4.5 months apart (the typical duration from deal announcement to completion) is indistinguishable from zero (–0.02). Hence, though market conditions tend to affect both hedge fund returns and M&A outcomes concurrently during the time around deal resolution, they are not correlated with the past excess returns of the arbitrage funds.

The "relevance" of the instrument is easier to attest. Column (1) of Panel A, Table 5

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[20]Using "supply side" capital shocks as instruments for "demand side" outcomes has been standard in the literature on similar settings. See, for example, Jiang, Li, and Wang (2012), Phillips and Zhdanov (2013), and Gantchev and Jotikasthira (2015).

indicates that *Prior excess return of activist funds* significantly (at the 1% level) predicts activist emergence shortly after deal announcement. The Cragg-Donald (1993) Wald F-statistic for weak instruments is 17.4, based on which we reject the hypothesis that the instrument is weak with a maximum relative bias (relative to the OLS estimate) of 10% at the 5% significance level. Intuitively, if an M&A deal is announced at a time activist funds have been doing well in the recent past, then it is easier for an activist fund to commit new capital to the announced deal, presumably because hedge fund investor flows follow past performance (Getmansky, Liang, Schwarz, and Wermers, 2015) and because funds themselves are more ready to build on prior success.

[Insert Table 5 here.]

The first two columns of Panel A reports simultaneous estimation of the *Deal completion* equation and the *Activist arbitrage* equation, where *Deal completion* is restricted to deals consummated with the announced buyer. The key coefficient is the one on *Activist arbitrage* in column (2). It turns out to be negative and significant (at the 5% level), entailing a marginal probability of 17.5%. Recall that Panel C of Table 4 shows that, on average, the completion probability in the subsample involving activists is 72.5%. Taking these numbers at their face value, the instrumented result implies the average "inherent" deal completion probability, in the absence of an activist intervention, would have been 90.0%, higher than the average of the non-activist subsample (85.7%). The estimated correlation coefficient between the residuals from the two equations, $\hat{\rho}$, is 0.45 (significant at the 5% level), indicating that unobserved deal vulnerability to activist intervention and unobserved propensity for deal completion are positively correlated. Consistent with our earlier discussion, activists select deals that are, *ex ante*, unlikely to fall through for unobserved reasons.

The last two columns of Panel A adopt an alternative definition of deal completion to include all targets that were eventually sold to any acquirer within one year from the initial announcement. The marginal effect of *Activist arbitrage* drops to –14.6% (significant at the 10% level). The difference between these two columns reflects the fact that a substantial number (21) of targets in our sample were sold to activist-recommended third-parties.

The interpretation of the results in Panel A hinges on the validity of our instrumental variable, which cannot be formally "proved." We, however, are able to provide a diagnostic test on the premise that prior NAV returns of the activist funds in our sample affect M&A

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deal closure only through the involvement of these activists. Figure 2 shows that activist arbitrage activities before 2005 were unimportant (appearing in about 0.5% of the announced M&A deals). Hence, *Prior excess return of activist funds* should not be significantly correlated with *Deal completion* during this period because there is no direct channel between the two. On the other hand, *Prior excess return of activist funds* should be negatively correlated with *Deal completion* post 2005 due to the indirect channel via activist arbitrage.

Such a contrast is confirmed in Panel B of Table 5, in which we run reduced-form probit regressions of *Deal completion* on *Prior excess return of activist funds*, controlling for the same covariates as in Table 4 (the endogenous variable *Activist arbitrage* is excluded), separately for the 2000-2005 and 2006-2014 periods. In the first period, a one percentage-point increase in *Prior excess return of activist funds* is associated with a 38 basis point decrease in *Deal completion* (t-statistic $= -0.94$); while in the second period the same marginal effect is -77 basis points (t-statistic $= -4.09$). During the period with very low activist arbitrage activities, the (reduced-form) effect of the instrumental variable was both economically small and statistically insignificant, suggesting that the variable does not directly contribute to the probability of deal completion.

4.2.2 Separating selection and treatment effects: A direct approach

In an attempt to identify a causal relationship, researchers often resort to instrumental variable analysis because they observe the "input" and "output" but not exactly the process in which the former affects the latter. This prevents them from concluding causation when selection is not random. In our context, there is more information on how and why a deal was withdrawn or modified and what roles activists played. We hence supplement our instrumental variable analysis presented in the previous section with a more direct approach, namely, making a direct judgment call on whether activists played a key role in terminating a deal based on legal filings, disclosures, and news searches.

More specifically, we classify a deal failure as "likely caused by the activist" if at least one of the following is true: (1) The activist's vote is pivotal in a negative voting outcome. (2) The voting outcome is negative after ISS issues a recommendation supporting the activist. (3) Management withdraws the deal citing activist dissent or lack of shareholder support, and there is no other concurrent public campaign against the deal. (4) The firm is sold to an activist-recommended third party.

We classify a deal failure as "possibly caused by the activist or other investors" if the activist campaign coexists with at least one of the following: (1) There is a negative voting outcome following the activist's public campaign but the activist's vote was non-pivotal. (2) Management withdraws the deal citing lack of shareholder support, and there are concurrent public campaigns (in addition to the one led by the activist) against the deal. (3) The firm is sold to a third-party (not affiliated with the activist) with evidence of shareholder pressure that may be related to the activist.

Finally, we classify a deal failure as "not caused by the activist" if at least one of the following is true: (1) The deal is cancelled due to a "material adverse change" (MAC). (2) The deal is cancelled due to antitrust or other regulatory challenges.

Column (1) of Panel C, Table 5 reports the detailed classifications under the three broad categories for a total of 76 failed deals with activist presence. The subcategories are not mutually exclusive; however, the percentage reported for each of the three main categories reflects the net number. It turns out that in 68.4% (column (1b)) of the failed deals with activist presence one can reasonably conclude that activism was the cause. Give that the deal failure rate is 27.5% for this sample, activists contributed to an incremental deal failure probability of 18.8% (column (1c)), a number that is on the same order of magnitude as the estimate from columns (1)-(2) of Panel A. If we exclude targets sold to third-parties from failed deals, then activists contributed to an incremental deal failure probability of 12.7%, corresponding to the estimate reported in columns (3)-(4) of Panel A. The magnitudes of these estimates are comparable to those from the instrumental variable approach (in Section 4.2.1), confirming our confidence in the reliability of the estimation.

As a placebo test, we collect a matching sample of deals involving no arbitrageurs, where a match is announced in the same year as the activist-involved deal with the closest deal size. Such an algorithm results in 53 matching deals, excluding duplications. Column (2) of Panel C, Table 5 reports the classifications of these deals parallel to those in column (1). As expected, the frequency of the match deals in the first main category is zero. A comparison of the two columns highlights the critical role of activists in reshaping the deals: deal failures due to "exogenous" reasons (category #3) have comparable representations between the two samples (both at 4.3%); however, activists target deals that are otherwise (in the absence of their intervention) less likely to fail (4.3% vs. 10.0%). Such a selection bias confirms that the estimated treatment effect (reported in panel A of Table 4) should be significantly larger

than simple correlation (reported in Panel A of Table 3).

5 Returns from Activist Arbitrage

After showing that activists cause more deal failures, it is important to demonstrate that losses from the incremental deal risk are more than compensated by improved deal terms among the survivors, so that we can address the fundamental question as whether activist risk arbitrageurs earn superior returns from their investment. To this end, we compute abnormal returns of the target stocks over a variety of time windows, and compare across deals involving activist arbitrageurs, passive-only arbitrageurs, and no disclosed arbitrageurs.

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

Following Schwert (1996), 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 this return premium is not "tradeable" from the 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, where resolution can be either effective deal completion or withdrawal. 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. Next, following the literature (e.g., Gaspar, Massa, and Matos, 2005), we 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 long-only positions in the targets

Given that activist arbitrageurs usually do not disclose their holdings in acquirers and that only 45 of 255 deals targeted by activist arbitrageurs are stock or hybrid deals, the target

long-only returns are a suitable measure of gains for most of the deals in our sample. Panel A of Table 6 presents cumulative abnormal returns for investors who hold long positions in target companies over the various time windows.

[Insert Table 6 here.]

Over the [54, resolution] window, Panel A of Table 6 shows that the takeover premium for deals involving activist arbitrageurs is about 24.8%, significantly (at the 1% level) lower than the average of 31.7% for deals targeted by passive arbitrageurs, and slightly (insignificant) lower than the average of 29.9% 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" (where the 6.4% vs. 5.9% difference is not significant). Schwert (1996) argues that there is little substitution between run-up and markup, and that the former is more related to private information. Thus, activist arbitrageurs do not seem to rely on superior private information (whether through sophisticated takeover prediction models or insider information) prior to deal announcements. In fact, they launch campaigns after deal announcements and aim for superior returns from the period just after the merger announcement to deal resolution.[21] Thus, by increasing returns, on average, for all shareholders who hold onto their positions in the target company beyond the announcement of the proposed merger, activist arbitrageurs' endeavors constitute a "public good."

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 merger announcement, we focus on 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 4.7% for deals involving activist arbitrageurs, greater than the average of 2.2% for those targeted by passive arbitrageurs and the average of –2.3% for those involving no disclosed arbitrageurs. However, only the

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[21]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.

difference with the latter is significant (at the 1% level). In annualized terms, the difference between the two forms of arbitrage amounts to 16.3% vs. 5.3% (significant at the 5% level). [22] The differences in the median abnormal returns are of similar nature and comparable magnitude.

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 as max(+2, disclosure−10), the later of the second trading day after the proposed deal is announced and ten (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). [23] 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 no-arbitrage (at the 1% level) subsample.

For completeness, the table also presents short-term target stock returns around the emergence of activist arbitrageurs. Using a 20-day window around their disclosure dates, the average and median CARs are about 2.6% and 1.6%, respectively (both are significant at the 1% level). Therefore, the market revises up the total premium expected upon learning the arrival of the activist arbitrageurs.

An alternative way to demonstrate the contrast between activist and passive arbitrageurs is through a decomposition of the total arbitrage return into "speculation spread" and "revision return." The former, as modelled in Jindra and Walkling (2003), the percentage difference between the bid price and market price one-day after the initial announcement; while the latter is the percentage change from the initial to the final bid price. Consistent with results in Table 6, activist arbitrage fares worse in speculation spread (an average of 2.1% vs. 6.7% for passive arbitrage) because its selective targeting on low-premium deals, but outperforms in revision returns (4.5% vs. -2.4%) due to its success in improving deal terms. The same relations prevail among completed as well as withdrawn deals.

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[22]Deal duration plays little role in annualizing the difference as the median durations of the two groups are close at 124 and 117 calendar days, respectively.

[23]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.

5.1.2 Returns from long-short strategies

For stock deals, conventional risk arbitrageurs often simultaneously take a long position in the target and a short position in the acquirer with the ratio of the long-short positions to be calibrated 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. This strategy is potentially even better for activists because improving deal terms for the target comes at the cost of the acquirers.

It turns out that relatively few stock deals (45 of them, or 19.3% of the activist subsample) are targeted by activist arbitrageurs, while about 31.5% of deals involving passive arbitrageurs are stock deals. Panel B of Table 6 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). The same pattern holds for activist arbitrageurs: their long-short CAR is larger than that enjoyed by passive arbitrageurs (although 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 of completed mergers. Target firms involving activists on average have lower total takeover premiums and markups than those involving passive or no disclosed arbitrageurs, consistent with the findings in Table 2 as well as those in Panel A of Table 6. The takeover premium is consistent with that in Boyson, Gantchev, and Shivdasani (2015), although they include a shorter run-up period and examine only cash deals. Importantly, the average CAR over the [+2, resolution] window for deals targeted by activists more than doubles that for deals involving passive arbitrageurs (7.1% vs. 3.3%; although the difference is insignificant, in annualized terms it is significant at the 5% 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.

Returns for withdrawn deals are reported in Panel D of Table 6. As expected, the

total takeover premiums, run-ups and markups for both types of arbitrage are significantly lower than those for successful deals. The 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 activists is much larger than that for deals with passive arbitrageurs (–0.6% vs. –6.0%; the difference is not significant due to the small sample size). The same average return for no-arbitrage deals is even lower, and the differences are significant at the 1% level. Relative to passive arbitrageurs, activists still fare better even conditioning on deal failure. The relatively benign outcome for withdrawn deals in our activist subsample is due to the fact that targets in 29.0% of the withdrawn deals were eventually sold to third parties, most of which were recommended by the activists. This is reminiscent of Bradley, Desai, and Kim's (1983) finding that superior information for takeover targets could arise from exploiting potential synergies rather than the "true" value of the target resources. Finally, the average 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 2.9%, significant at the 5% level), indicating that the market expects a positive effect of activist involvement even for ex post failed deals.

The combined evidence suggests that activists generate higher premium revisions for themselves as well as the target shareholders in successful deals, but do not cause notable losses when deals fail under the current term. Hence, the news of their emergence invites positive market responses.

6   Activist Arbitrage in Acquirers

For completeness, we supplement our analysis of arbitrage on the target side with the same analysis for activism on the acquirer side when the latter are publicly traded. Following the procedure detailed in Section 2, we identify 47 cases where activists act in accordance with their rights as shareholders of the acquirers. Due to the different characteristics that attract activist intervention on the target vs. the acquirer side, there is no overlap of deals between the two strategies.

6.1 Characteristics of deals involving activist arbitrageurs

Similar to Table 2, Table 7 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 from a one-to-many matched sample (column (3)). The matched companies for each acquirer targeted by activists are assigned from the same year, the same SIC three-digit industry, and the same deal-size decile.

[Insert Table 7 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 at announcement. 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 in terms of return on assets (ROA). Importantly, deals held by activists have, on average, a large negative revision return (–5.8%) for the target stock when publicly listed (significantly lower than those for the control samples at the 5% level). This indicates that activist arbitrageurs are often successful in forcing the acquirer to lower its bid, if the deal goes through. On the other hand, for deals targeted by activist arbitrageurs, deal duration is about 100 days longer and the completion rate 36 - 37 percentage points lower (both significant at the 1% level). Thus, activists tend to block mega-deals by attempting to lower the bids, substantially 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 (Moeller, Schlingemann, and Stulz, 2005), which 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 acquirers tend to be the opposite of those taken by 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 must long the acquirer in order

to exercise shareholder rights, advocating for modifications to the announced deals (i.e., lowering the bids) or for terminating the over-paying deals.[24] Such a critical difference makes activist risk arbitrage a novel addition to the strategy space as well to the literature.

Table 8 reports abnormal returns for activist investors who long acquiring firms and campaign against the proposed deals. For the run-up, we do not find much of a difference between the two groups. As expected, activist arbitrageurs earn a much higher average return in the post-deal announcement time period. The average CAR over the [+2, resolution] window is 4.2% for the activists, greater than a –3.4% return for investors in other deals (the difference is insignificant at the 10% level) and a –1.8% for those investing in matched deals. For robustness, we also calculate CAR over the [max(+2, disclosure−10), resolution], and the results are consistent with our main findings. The difference in the average CARs for activists and other investors is 10.9%, significant at the 5% level. Relatedly, market's reaction to the disclosure of activist involvement is positive: the average CAR for the acquirer stocks measured over the 20-day window around the disclosure date is 3.9%, significantly different from zero at the 5% level.

[Insert Table 8 here.]

On an annualized basis, the average return accrued to activist arbitrageurs on the acquirer side is 10.5% from post-deal announcement to resolution; smaller than that 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 conventional (passive) risk arbitrage, activist arbitrageurs select deals that are more susceptible to managerial conflicts of interest, including

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

going-private deals (especially management buy-outs), "friendly" deals (in which the boards endorse preferred buyers), and deals with lower announcement premiums. Activists decrease the probability that deals will be completed with the current bidder. However, their presence increases the probability that deals welcomed by the market will be completed. Finally, activist risk arbitrage yields significantly higher returns than passive arbitrage, even after taking into account 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 an activist arbitrage in the target company of an M&A transaction, compared with that of a passive arbitrage, from initial deal announcement to resolution.
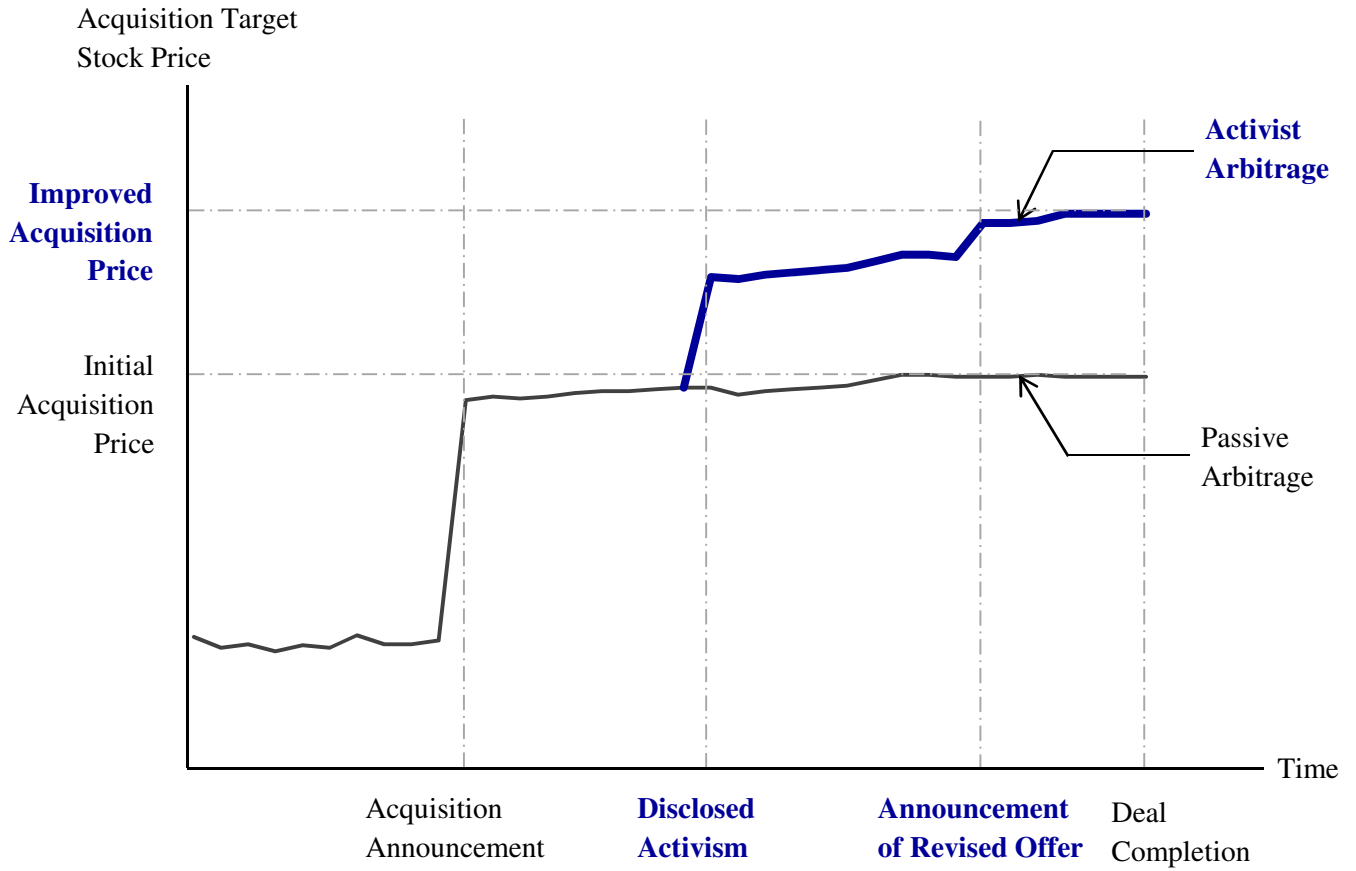
Figure 2: M&A Transactions and Activist Arbitrageur Activities, 2000-2014

This figure shows the annual volume of M&A transactions and activist arbitrage activities from 2000 to 2014. 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 news archives. Section 2 provides detailed information about the sample and data.
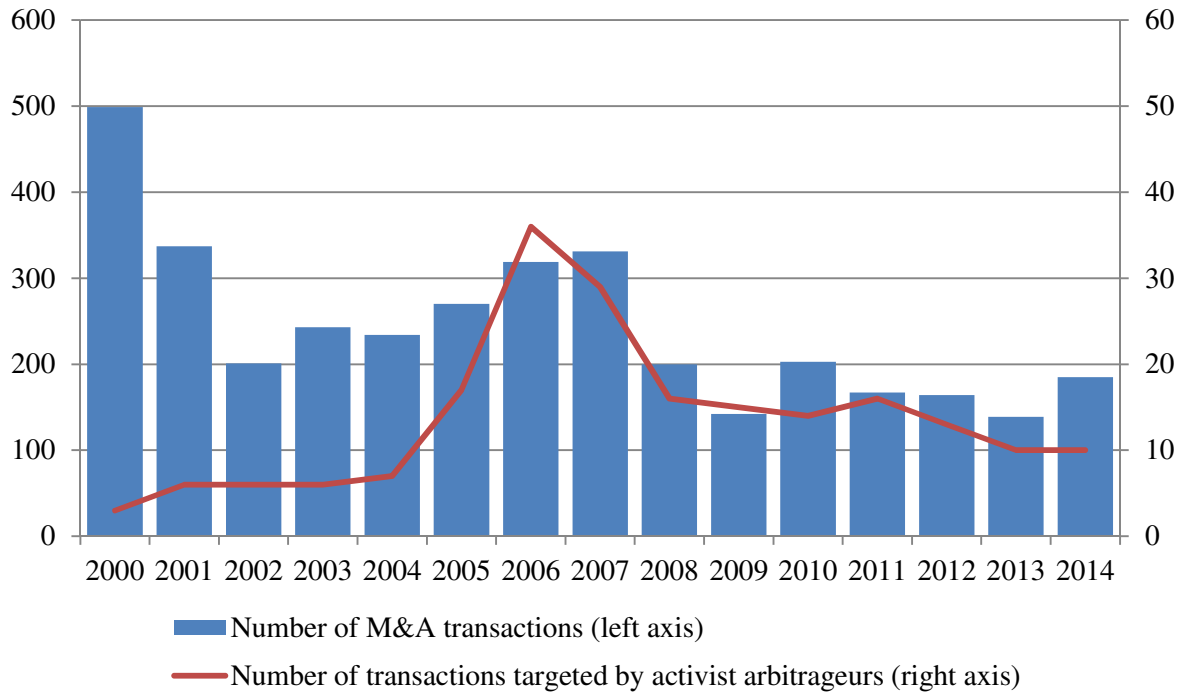
Table 1: Activist Risk Arbitrageurs' Capital Commitment and Investment Horizon

Columns (1) and (2) of this table report the summary statistics of the size of activist risk arbitrageurs' stakes in merger targets 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 stake that the lead activist risk arbitrageur holds in a merger target when it files the initial Schedule 13D or issues the first press release. The "Maximum" columns report the maximum stake the activist attained during the event until resolution. Columns (3) and (4) report the number of calendar days between the deal announcement and initial disclosure of arbitrageur stakes, and between the initial disclosure and deal resolution (consummation or withdrawal), respectively. The sample size is 233 deals from 2000 to 2014.

	(1)		(2)		(3)	(4)
	Invested capital ($ million)		% Ownership		Days between deal announcement and initial disclosure	Days between initial disclosure and resolution
	Initial	Maximum	Initial	Maximum		
Mean	110.0	144.0	8.7%	11.1%	47.4	105.1
Std. Dev.	289.9	327.7	8.2%	9.5%	65.9	84.9
5th Percentile	1.4	1.9	0.5%	0.5%	2	18
25th Percentile	6.9	7.8	4.8%	5.2%	6	45
Median	25.3	29.4	7.0%	8.9%	25	83
75th Percentile	79.3	118.3	9.9%	14.8%	64	136
95th Percentile	504.6	710.2	20.1%	26.2%	169	273

Table 2: Deal Characteristics

This table reports characteristics of the 204 deals involving activists, and compares them to 2,549 deals with passive-only arbitrageurs and 881 deals with no disclosed arbitrageurs, respectively. Our sample includes all cash, stock and hybrid deals from 2000 to 2014. 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 deal price at resolution. *Completion rate* is the ratio of announced deals that are eventually completed with the initial acquirer to total announced deals. *Deal duration* is the number of calendar days between the first M&A 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. *Same industry* equals to one if the target and acquirer are in the same three-digit SIC industry. Finally, *Institutional ownership* and *Insider ownership* are the proportion of shares held by institutional investors and company insiders, respectively, as reported by the Thomson Reuters Ownership Database. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A. Ex ante deal characteristics

	Merger targets held by activist risk arbitrageurs			Difference with targets by passive-only arbitrageurs		Difference with targets with no disclosed arbitrageurs	
	Average (1a)	Median (1b)	Std. Dev. (1c)	Diff. in Avg. (2a)	*t*-stat. of Diff. (2b)	Diff. in Avg. (3a)	*t*-stat. of Diff. (3b)
Announcement premium	18.9%	14.5%	23.4%	–13.8%***	–7.55	–18.5%***	–8.00
Deal value ($ million)	2,559.3	479.6	6,061.9	356.4	0.80	1,740.0***	3.89
Return on assets (ROA)	2.9%	9.0%	62.3%	–2.1%	–0.48	2.3%	0.49
% Going private	43.6%	0	49.7%	19.5%***	5.43	16.6%***	4.38
% Stock deal	12.3%	0	32.9%	–10.3%***	–4.20	–11.0%***	–4.07
% Acquirer toehold	2.2%	0	8.0%	0.9%	1.62	0.4%	0.67
% Friendly	95.6%	1	20.6%	2.0%	1.30	3.5%**	2.07

	Merger targets held by activist risk arbitrageurs			Difference with targets by passive-only arbitrageurs		Difference with targets with no disclosed arbitrageurs	
	Average (1a)	Median (1b)	Std. Dev. (1c)	Diff. in Avg. (2a)	t-stat. of Diff. (2b)	Diff. in Avg. (3a)	t-stat. of Diff. (3b)
% Defense	1.5%	0	12.1%	–2.5%***	–2.72	–2.0%*	–1.95
% Tender offer	14.7%	0	35.5%	0.7%	0.27	0.3%	0.11
Same industry	36.8%	0	48.3%	–10.1%***	–2.87	–4.3%	–1.15
Institutional ownership	56.2%	55.2%	28.5%	3.7%*	1.77	34.8%***	16.28
Insider ownership	19.0%	9.1%	24.2%	–1.5%	–0.85	–1.3%	–0.70

Panel B. Ex post deal characteristics

	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)	Median (1b)	Std. Dev. (1c)	Diff. in Avg. (2a)	t-stat. of Diff. (2b)	Diff. in Avg. (3a)	t-stat. of Diff. (3b)
% Multiple bidders	27.0%	0	44.5%	20.3%***	6.42	14.9%***	4.52
Revision return	4.6%	0	12.4%	3.6%***	3.99	3.4%***	3.40
Completion rate	72.5%	1	44.9%	–14.6%***	–4.58	–6.5%*	–1.89
Deal duration	148.4	124.5	101.3	12.5*	1.71	5.0	0.63

Table 3: 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 2, 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 2014. The base outcome is a merger target that does not involve any disclosed arbitrageurs (category = 0). Panel B applies a probit and a linear probability model on the subsample that excludes the 0 category. The dependent variable is a dummy variable equal to one if the deal is targeted by activist arbitrageurs, and zero 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 the 10%, 5% and 1% levels, respectively.

Panel A. Determinants of activist arbitrage among all M&A deals using the unordered multinomial logit model

Deal characteristics	Deals with activist arbitrageurs (category=1)	t-stat.	Marg. Prob.	Deals with passive arbitrageurs (category=2)	t-stat.	Marg. Prob.
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
Announcement premium	−2.03***	−5.85	−10.7%	−0.07	−0.62	8.1%
Going private	0.83***	4.21	4.1%	0.08	0.68	−2.4%
Friendly	1.26***	2.93	4.0%	0.62***	3.00	4.7%
Institutional ownership	4.49***	10.83	5.5%	4.18***	15.06	49.2%
Deal value (log $ million)	0.27***	4.12	0.4%	0.24***	5.97	2.8%
Acquirer toehold	2.07*	1.91	6.5%	1.05*	1.69	8.1%
Insider ownership	0.64*	1.75	1.5%	1.09***	5.24	15.2%
Same industry	−0.11	−0.60	−1.0%	0.08	0.80	1.9%
Return on assets (ROA)	−0.03	−0.08	−0.4%	0.04	0.27	0.8%
Stock deal	−0.34	−1.21	−2.7%	0.19	1.45	4.7%
Defense	−0.63	−0.94	−3.6%	0.04	0.14	3.5%
Tender offer	−0.10	−0.39	0.7%	−0.26*	−1.87	−3.9%
Observations	3,180					
Pseudo r-squared	0.19					
% (Dep variable = 1)	6.1%			71.7%		

Panel B. Determinants of activist arbitrage conditional on the presence of any arbitrageurs

Dependent variable: Dummy for activist arbitrageurs	Probit			Linear Probability Model	
	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.
Deal characteristics	(1a)	(1b)	(1c)	(2a)	(2b)
Announcement premium	−0.93***	−4.79	−11.6%	−0.05***	−3.96
Going private	0.37***	4.14	5.2%	0.03**	2.16
Friendly	0.27	1.42	2.8%	0.06***	3.70
Institutional ownership	0.15	0.84	1.8%	0.03	1.24
Deal value (log $ million)	0.01	0.22	0.1%	0.01**	2.49
Acquirer toehold	0.48	0.89	5.9%	0.06	0.65
Insider ownership	−0.20	−1.23	−2.4%	−0.02	−1.13
Same industry	−0.10	−1.19	−1.2%	−0.01	−0.85
Return on assets (ROA)	0.01	0.01	0.1%	−0.01	−1.27
Stock deal	−0.23*	−1.89	−2.6%	−0.04***	−4.12
Defense	−0.31	−1.16	−3.1%	−0.02	−1.17
Tender offer	0.09	0.78	1.1%	0.02	1.46
Observations	2,473			1,921	
Pseudo r-squared	0.07				
Adj. r-squared				0.42	
Investor fixed effects	No			Yes	
% (Dep variable = 1)	7.6%			7.1%	

Table 4: Deal Completion/Resolution and Activist Risk Arbitrage

This table relates merger deal completion/resolution to the involvement of activist arbitrageurs. All variables, unless otherwise specified, are as defined in Table 2. The sample consists of all M&A deals between 2000 and 2014. Panel A reports the effects of activist arbitrageurs' presence (*Activist arbitrage*) and other covariates on the probability of deal consummation. In column (1), the dependent variable, *Deal completion*, is a dummy variable equal to one if the target is sold to the initial bidder, zero if withdrawn. In column (2), the dependent variable, *Alternative deal completion*, is an indicator equal to one if a deal is sold to the initial bidder or a third party within one year after the first formal acquisition announcement, and zero otherwise. Panel B analyzes the time duration to deal resolution. Columns (1) and (3) report results of an OLS model where the dependent variable is the logarithm of the number of days between the merger announcement and announced resolution of the deal. Columns (2) and (4) apply a Cox (1972) proportional hazards model to estimate the hazard rate on a daily frequency for deal resolution. In columns (1) and (2), deal resolution refers to the completion or withdrawal of the current deal; while in columns (3) and (4), deal resolution extends to the sale of the target to any acquirer within one year from the initial announcement. Panel C compares the determinants of deal completion between deals with and without arbitrageurs. The key independent variable, *Ex ante completion probability*, is proxied by $(P_{+1} - P_{-1}) / (P_{\text{Initial Offer}} - P_{-1})$, in which $P_{\text{Initial Offer}}$ 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 all specifications, we report coefficients, their heteroscedasticity-robust *t*-statistics, and, when applicable, 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. Deal completion

Dependent variable:	Deal completion			Alternative deal completion		
	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
Activist arbitrage	–0.18*	–1.66	–3.5%	–0.16	–1.52	–2.9%
Announcement premium	–0.13	–1.63	–2.5%	–0.10	–1.14	–1.4%
Deal value (log $ million)	0.07***	3.07	1.3%	0.05**	2.27	0.7%
Going private	–0.46***	–6.19	–9.9%	–0.41***	–5.34	–7.7%
Stock deal	–0.16*	–1.83	–3.1%	–0.16*	–1.87	–2.8%
Acquirer toehold	–0.65	–1.48	–12.2%	–0.95*	–1.90	–15.7%
Friendly	2.19***	19.35	70.7%	1.78***	17.34	55.2%
Tender offer	0.59***	5.07	8.6%	0.52***	4.63	6.9%
Defense	–0.35**	–2.35	–8.0%	–0.45***	–3.23	–9.3%
Same industry	0.14**	2.06	2.6%	0.11*	1.69	2.0%
Return on assets (ROA)	0.01	0.01	0.1%	0.01	0.04	0.3%
Institutional ownership	–0.03	–0.20	–0.5%	0.04	0.28	1.1%
Insider ownership	0.67***	4.05	12.7%	0.87***	4.41	14.8%
Observations	3,180			3,180		
Pseudo r-squared	0.26			0.22		
% (Dep variable = 1)	84.9%			87.4%		

Panel B. Deal duration

Dependent variable	# Days to the resolution of the current deal				# Days to any resolution			
	OLS		Cox model		OLS		Cox model	
	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.	Coefficient	t-stat.
	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)	(4a)	(4b)
Activist arbitrage	0.07	1.52	–0.17*	–1.91	0.06	1.20	–0.14*	–1.81
Announcement premium	–0.02	–0.85	0.06	1.26	0.07	1.37	0.05	1.06
Deal value (log $ million)	0.05***	6.23	–0.09***	–7.16	0.02**	1.96	–0.09***	–7.17
Going private	0.02	0.79	–0.06	–1.30	0.31***	5.98	–0.08*	–1.77
Stock deal	0.13***	5.62	–0.16***	–3.26	0.21***	5.07	–0.14***	–3.03
Acquirer toehold	1.29***	8.39	–2.35***	–7.72	1.08***	3.64	–2.33***	–7.65
Friendly	–0.04	–0.73	0.29***	3.90	–1.10***	–10.36	0.42***	5.67
Tender offer	–0.48***	–17.14	0.81***	15.39	–0.54***	–9.69	0.84***	15.88
Defense	0.19***	3.08	–0.45***	–4.48	0.29***	3.00	–0.47***	–4.62
Same industry	0.02	1.17	–0.02	–0.60	0.05	1.19	–0.02	–0.55
Return on assets (ROA)	0.11**	2.50	–0.21***	–3.35	0.23***	2.96	–0.20***	–3.28
Institutional ownership	–0.22***	–5.07	0.46***	5.56	–0.31***	–4.04	0.46***	5.55
Insider ownership	–0.18***	–4.51	0.32***	4.49	–0.35***	–4.53	0.33***	4.65
Observations	3,180		432,418		3,180		442,500	
r-squared	0.16				0.13			
Wald Chi-squared			260.35				306.75	

Panel C. Deal completion, activist arbitrage, and market signals

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)	(3)
Ex ante completion probability	1.25***	4.56	34.3%	0.53***	5.44	9.3%	2.46**
Deal value (log $ million)	0.28***	3.98	5.3%	0.05**	2.34	1.0%	3.03***
Going private	-0.61***	-2.74	-23.7%	-0.39***	-5.08	-8.2%	-0.91
Stock deal	0.44	1.15	5.8%	-0.07	-0.76	-1.2%	1.29
Acquirer toehold	-1.82	-1.47	-7.5%	-0.55	-1.21	-10.2%	-0.96
Friendly	1.51***	2.98	52.5%	2.15***	18.88	69.4%	-1.23
Tender offer	0.92***	3.53	25.5%	0.50***	4.23	7.4%	1.47
Defense	-0.34**	-2.26	-7.7%	-0.33**	-2.24	-7.3%	-0.04
Same industry	0.13	0.54	4.8%	0.17**	2.55	3.1%	-0.19
Return on assets (ROA)	0.09	0.64	5.1%	-0.06	-0.42	-1.2%	0.75
Institutional ownership	-1.28***	-2.72	-22.0%	0.08	0.53	1.4%	-2.75***
Insider ownership	0.52	1.27	9.2%	0.62***	3.81	11.5%	-0.22
Observations	194			2,986			
Pseudo r-squared	0.23			0.26			
% (Dep variable = 1)	72.5%			85.7%			

Table 5: Deal Completion and Activist Arbitrage: Selection and Treatment Effects

This table separates activists' treatment effect from the selection effect on deal completion. All variables, unless otherwise specified, are as defined in Table 2, and are measured at the date of announcement. Panel A reports the results from a bivariate probit model consisting of two simultaneous equations, one for *Deal completion* and the other for the presence of *Activist arbitrage*. The instrumental variable, *Prior excess return of activist funds* (in percentage points), is the excess return over the CRSP value-weighted return of the 74 activist funds in our sample that appear in the Lipper TASS and CISDM databases during the [t–6, t–1] month window, where t is the month of deal announcement. In columns (1) and (2), *Deal completion* refers to a successful sale of the target to the announced acquirer; while, in columns (3) and (4), *Alternative deal completion* is defined as a successful sale to any acquirer within one year from the initial announcement. The panel reports bivariate 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. Panel B reports the reduced-form regressions of *Deal Completion* on *Activist arbitrage* (and control variables) separately for the 2000-2005 (when activist involvement was scant) and 2006-2014 (when such activities were more common). Panel C reports the manual classifications of the underlying causes of deal failures based on SEC filings, press releases, and news searches. The sample includes all 76 failed deals with activist presence and 53 matched deals without activists. The percentages in column (2c) are scaled by the percent of all withdrawn deals involving no activists. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A. Selection in deal completion: Bivariate probit model

	Equation 1: Activist arbitrageurs' presence			Equation 2: Deal completion			Equation 1: Activist arbitrageurs' presence			Equation 2: Alternative deal completion		
	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)	(4a)	(4b)	(4c)
Activist arbitrage				–0.94**	–2.28	–17.5%				–0.85*	–1.86	–14.6%
Announcement premium	–0.91***	–5.01	–10.1%	–0.10	–1.34	–2.2%	–0.90***	–5.12	–10.0%	–0.11	–1.25	–1.7%
Deal value (log $ million)	0.03	1.18	0.4%	0.02	1.16	0.5%	0.04	1.33	0.4%	0.05*	1.91	0.7%
Going private	0.38***	4.58	4.3%	–0.25***	–3.52	–5.5%	0.38***	4.47	4.2%	–0.39***	–4.73	–6.3%
Stock deal	–0.19	–1.57	–2.1%	–0.16*	–1.91	–2.6%	–0.19	–1.56	–2.1%	–0.16*	–1.92	–2.7%
Acquirer toehold	0.47	0.98	5.3%	–0.41	–1.00	–9.1%	0.48	0.97	5.3%	–0.90*	–1.88	–14.8%
Friendly	0.42**	2.27	4.6%	1.93***	17.75	43.1%	0.38**	2.13	4.3%	1.78***	17.36	29.1%
Tender offer	0.04	0.34	0.4%	0.34***	3.72	7.5%	0.05	0.52	0.6%	0.53***	4.74	8.7%
Defense	–0.25	–0.95	–2.8%	–0.35**	–2.30	–5.9%	–0.27	–1.02	–3.0%	–0.44***	–3.16	–7.3%
Same industry	–0.09	–1.19	–1.0%	0.07	1.21	1.6%	–0.10	–1.20	–1.1%	0.11*	1.70	1.9%
Return on assets (ROA)	–0.35**	–2.14	–3.9%	0.04	0.33	0.8%	–0.35**	–2.20	–3.9%	–0.01	–0.08	–0.2%
Institutional ownership	0.39***	2.45	4.4%	–0.05	–0.36	–1.0%	0.40**	2.48	4.5%	0.09	0.58	1.4%
Insider ownership	–0.10	–0.64	–1.1%	0.62***	4.54	13.8%	–0.09	–0.55	–0.9%	0.88***	4.49	14.4%
Prior excess return of activist funds (%)	0.02***	2.68	0.3%				0.02**	2.39	0.2%			
Observations	3,180						3,180					
Wald F-statistic for weak instrument	17.4						17.3					
$\hat{\rho}$ (correlation of residuals from the two equations)	0.45	2.33					0.43	2.15				

Panel B. Deal completion and prior excess return of activist funds

	Dependent variable: Deal completion					
	2000-2005			2006-2014		
	Coefficient	*t*-stat.	Marg. Prob.	Coefficient	*t*-stat.	Marg. Prob.
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
Prior excess return of activist funds (%)	–0.020	–0.94	–0.37%	–0.028***	–4.09	–0.77%
Other control variables	Yes			Yes		
Observations	1,266			1,914		
Pseudo r-squared	0.21			0.27		
% (Dep variable = 1)	84.4%			85.2%		

Panel C. Direct classification of the causes of deal failures

Causes of deal failure	Deals involving activist risk arbitrageurs			Matching deals involving no activists		
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
	# Cases	% of withdrawn deals	% of all deals	# Cases	% of withdrawn deals	% of all deals
1. Likely caused by activists	**52**	**68.42%**	**18.82%**	**–**	**–**	**–**
1.A. Activist's vote pivotal	6	7.89%	2.17%			
1.B. Negative vote after ISS's support for the activist	4	5.26%	1.45%			
1.C Managerial withdrawal citing activist dissention & no other concurrent campaign	25	32.89%	9.04%			
1.D Firm sold to an activist-recommended third-party	21	27.63%	7.60%			
2. Possibly caused by activists or other investors	**12**	**15.79%**	**4.34%**	**37**	**69.80%**	**9.98%**
2.A. Other negative voting outcome	9	11.84%	3.26%	4	7.50%	1.07%
2.B. Managerial withdrawal due to lack of shareholder support	2	2.63%	0.72%	19	35.80%	5.12%
2.C. Firm sold to a third-party due to shareholder pressure	1	1.32%	0.36%	14	26.40%	3.78%
3. Not caused by activists	**12**	**15.79%**	**4.34%**	**16**	**30.20%**	**4.32%**
3.A. Material adverse change	10	13.16%	3.62%	7	13.20%	1.89%
3.B. Antitrust and other regulatory challenges	2	2.63%	0.72%	9	17.00%	2.43%

Table 6: Cumulative Abnormal Returns and Activist Risk Arbitrage

This table reports cumulative abnormal returns ("CAR") for deals held by activist or passive arbitrageurs and for deals without 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 announcement. *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. Market premium [–1, +2]* is the CAR from one trading day before the deal announcement till the second trading day after the deal announcement. *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 later 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 calculation of risk arbitrage returns follows Hsieh and Walkling (2005). For long-target strategy, arbitrageurs' daily total return is the merger target's stock return on day t. For the long-short strategy, arbitrageurs' daily total return equals the difference between the target 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. In each column we report the summary statistics and the associated t-statistics or Wilcoxon 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 (n=233)		Deals with only passive arbitrageurs (n=2,536)			Deals without disclosed arbitrageurs (n=844)		
	(1a) Mean	(1b) 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]	24.8%***	20.8%***	31.7%***	26.4%***	–6.9%**	29.9%***	31.0%***	–5.1%
	[8.39]	[8.03]	[27.50]	[28.90]	[–2.17]	[10.94]	[13.96]	[–1.27]
Run–up [–54, –1]	6.4%***	3.5%***	5.9%***	3.6%***	0.5%	7.7%***	5.0%***	–1.3%
	[3.66]	[3.33]	[10.06]	[10.51]	[0.27]	[6.21]	[7.02]	[–0.61]
Market premium [–1, +2]	14.7%***	12.7%***	24.4%***	19.3%***	–9.7%***	25.1%***	19.3%***	–10.4%***
	[12.11]	[11.49]	[41.23]	[39.91]	[–7.18]	[21.92]	[21.34]	[–6.23]
Markup [–1, Resolution]	19.4%***	17.8%***	26.7%***	21.9%***	–7.3%***	23.1%***	22.9%***	–3.7%
	[8.64]	[8.32]	[28.75]	[30.72]	[–3.00]	[10.77]	[14.00]	[–1.19]
CAR [+2, Resolution]	4.7%**	2.0%**	2.2%***	0.4%**	2.5%	–2.3%	–1.1%	7.0%***
	[2.40]	[2.22]	[3.34]	[2.44]	[1.21]	[–1.30]	[–1.06]	[2.65]
CAR [max(+2, Disclosure – 10), Resolution]	5.0%***	2.4%***	2.2%***	0.4%**	2.8%	–2.3%	–1.1%	7.3%***
	[2.79]	[2.78]	[3.34]	[2.44]	[1.47]	[–1.30]	[–1.06]	[2.90]
CAR [max(+2, Disclosure – 10), Disclosure + 10]	2.6%***	1.6%***						
	[3.59]	[3.74]						

Panel B. Cumulative abnormal returns: Long-short strategies for stock deals (including hybrid deals)

	Deals with activist arbitrageurs (n=45)		Deals with passive arbitrageurs (n=800)			Deals without disclosed arbitrageurs (n=232)		
	(1a)	(1b)	(2a)	(2b)	(2c)	(3a)	(3b)	(3c)
	Mean	Median	Mean	Median	Diff. b/t (1a) & (2a)	Mean	Median	Diff. b/t (1a) & (3a)
CAR [+2, Resolution]	8.8%	6.5%	6.0%***	3.9%***	2.8%	−6.6%	−0.3%	15.4%**
	[1.62]	[1.46]	[3.21]	[5.44]	[0.49]	[−1.20]	[−0.31]	[1.99]
CAR [max(+2, Disclosure − 10), Resolution]	7.8%	2.9%	6.0%***	3.9%***	1.8%	−6.6%	−0.3%	14.4%*
	[1.53]	[1.51]	[3.21]	[5.44]	[0.33]	[−1.20]	[−0.31]	[1.92]
CAR [max(+2, Disclosure − 10), Disclosure + 10]	5.3%**	2.1%**						
	[2.47]	[2.48]						

Panel C. Cumulative abnormal returns for completed deals: Long merger targets

	Deals with activist arbitrageurs (n=162)		Deals with only passive arbitrageurs (n=2,235)			Deals without disclosed arbitrageurs (n=679)		
	(1a) Mean	(1b) 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]	27.7%***	20.9%***	33.6%***	27.4%***	−5.9%	35.2%***	34.2%***	−7.5%*
	[7.92]	[7.36]	[28.00]	[28.86]	[−1.60]	[12.28]	[14.20]	[−1.66]
Run–up [−54, −1]	7.1%***	5.6%***	6.0%***	3.8%***	1.1%	8.2%***	4.7%***	−1.1%
	[3.35]	[3.15]	[9.83]	[10.21]	[0.50]	[5.92]	[6.51]	[−0.43]
Markup [−1, Resolution]	21.5%***	19.4%***	28.5%***	22.8%***	−7.0%**	28.1%***	26.3%***	−6.6%*
	[8.33]	[7.58]	[29.59]	[30.77]	[−2.54]	[12.79]	[14.86]	[−1.95]
CAR [+2, Resolution]	7.1%***	2.0%**	3.3%***	0.7%***	3.8%	0.6%	−0.5%	6.5%**
	[3.11]	[2.56]	[5.01]	[3.65]	[1.60]	[0.32]	[−0.11]	[2.20]
CAR [max(+2, Disclosure − 10), Resolution]	7.5%***	2.4%***	3.3%***	0.7%***	4.2%*	0.6%	−0.5%	6.9%**
	[3.51]	[3.15]	[5.01]	[3.65]	[1.88]	[0.32]	[−0.11]	[2.43]
CAR [max(+2, Disclosure − 10), Disclosure + 10]	2.5%***	1.6%***						
	[2.72]	[2.95]						

Panel D. Cumulative abnormal returns for withdrawn deals: Long merger targets

	Deals with activist arbitrageurs (n=71)		Deals with passive arbitrageurs (n=301)			Deals without disclosed arbitrageurs (n=165)		
	(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]	18.4%***	20.2%***	17.7%***	18.3%***	0.7%	7.7%	13.4%***	10.7%
	[3.33]	[3.51]	[4.69]	[5.32]	[0.10]	[1.07]	[2.78]	[1.17]
Run–up [−54, −1]	4.6%	2.3%	5.1%**	2.0%***	−0.5%	5.6%**	5.7%***	−1.0%
	[1.52]	[1.27]	[2.59]	[2.74]	[−0.14]	[2.03]	[2.63]	[−0.25]
Markup [−1, Resolution]	14.8%***	16.6%***	13.1%***	11.4%***	1.8%	2.5%	7.5%*	12.3%*
	[3.34]	[3.65]	[4.29]	[5.28]	[0.33]	[0.42]	[1.67]	[1.66]
CAR [+2, Resolution]	−0.6%	1.8%	−6.0%**	−4.6%**	5.4%	−13.9%**	−5.1%**	13.3%**
	[−0.17]	[0.13]	[−2.26]	[−2.45]	[1.16]	[−2.54]	[−2.04]	[2.00]
CAR [max(+2, Disclosure − 10), Resolution]	−0.5%	1.8%	−6.0%**	−4.6%**	5.5%	−13.9%**	−5.1%**	13.4%**
	[−0.14]	[0.27]	[−2.26]	[−2.45]	[1.29]	[−2.54]	[−2.04]	[2.09]
CAR [max(+2, Disclosure − 10), Disclosure + 10]	2.9%**	1.5%**						
	[2.43]	[2.34]						

Table 7: Characteristics of Acquirers with and without Activist Arbitrageurs

This table reports the characteristics of the 43 acquiring companies involving activists that can be matched to the SDC database, and compares them to the 13,837 deals with no disclosed activists, and a matched sample of 372 deals, respectively, from 2000 to 2014. 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. All independent variables are as defined in Table 3. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Merger acquirers targeted by activist risk arbitrageurs			Difference with deal without disclosed activists		Difference with the matched sample	
	Average	Median	Std. Dev.	Diff. in Avg.	*t*-stat. of Diff.	Diff. in Avg.	*t*-stat. of Diff.
Ex ante characteristics	(1a)	(1b)	(1c)	(2a)	(2b)	(3a)	(3b)
Announcement premium (when the target is public)	23.3%	21.9%	22.5%	–3.8%	–1.01	–4.0%	–0.77
Deal value ($ million)	3,365.2	2004.0	5,322.0	2,663.4***	3.28	–	–
Return on assets (ROA)	3.9%	8.5%	15.7%	1.6%	0.26	10.2%	1.33
% Stock deal	35.9%	0	37.9%	26.9%***	3.57	27.7%***	3.60
% Acquirer toehold	0.4%	0	2.0%	–0.1%	–0.49	–0.1%	–0.30
% Multiple bidders	13.8%	0	38.7%	12.2%**	2.07	11.4%*	1.91
% Friendly	96.6%	100%	18.6%	–1.7%	–0.61	–2.9%	–1.02
% Tender offer	6.9%	0	25.5%	4.0%	1.02	3.9%	0.99
% Defense	3.4%	0	18.6%	2.4%	0.86	3.4%	1.22
Same industry	58.6%	100%	50.1%	10.2%	1.33	–	–
Institutional holdings	39.5%	35.5%	38.9%	–7.5%	–1.26	–7.1%	–1.14
Ex post outcomes							
Revision return (of the target if public)	–5.8%	0	17.5%	–6.8%**	–2.53	–7.2%**	–2.53
Completion rate	58.6%	100%	50.1%	–36.1%***	–4.72	–37.1%***	–4.81
Deal duration	185.5	147.0	118.0	98.8***	5.48	111.2***	5.98

Table 8: Cumulative Abnormal Returns from Activist Arbitrage on Acquirers

This table reports CARs of acquirers held by activist arbitrageurs, and compares them to the 13,837 deals with no disclosed activists, and a matched sample of 372 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 announcement. *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. *Market reaction [–1, +2]* is the CAR from one trading day before the deal announcement till the close of the second trading day after deal announcement. *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 later 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 Wilcoxon *z*-statistics (in brackets). *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

	Acquirers held by activist arbitrageurs (n=43)		Other deals (n=13,837)			Matched deals (n=372)		
	(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]	–1.7%	–0.5%	–1.2%***	–0.8%***	–0.5%	–2.0%*	–2.2%	0.2%
	[–0.78]	[–0.42]	[–5.02]	[–6.81]	[–0.24]	[–1.74]	[–1.13]	[0.09]
Market reaction [–1, +2]	–5.2%***	–4.6%	0.9%***	0.2%***	–6.1%***	1.1%***	0.5%**	–6.4%***
	[–3.50]	[–3.19]	[8.90]	[7.96]	[–4.09]	[19.29]	[2.30]	[–4.02]
Markup [–1, Resolution]	–0.3%	–1.0%	–2.5%***	–0.6%***	2.3%	–0.8%	–0.6%	0.6%
	[–0.05]	[–0.30]	[–8.25]	[–7.31]	[0.47]	[–0.56]	[–0.55]	[0.11]
CAR [+2, Resolution]	4.2%	3.3%*	–3.4%***	–0.9%***	7.6%	–1.8%	–1.1%*	5.9%
	[0.90]	[1.75]	[–11.80]	[–12.25]	[1.63]	[–1.30]	[–1.65]	[1.23]
CAR [max(+2, Disclosure – 10), Resolution]	7.4%	5.8%**	–3.4%***	–0.9%***	10.9%**	–1.8%	–1.1%*	9.2%*
	[1.52]	[2.18]	[–11.80]	[–12.25]	[2.22]	[–1.30]	[–1.65]	[1.81]
CAR [max(+2, Disclosure – 10), Disclosure + 10]	3.9%**	2.1%*						
	[2.06]	[1.89]						

Appendix

A: An Example of 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' disappointment in the deal (although part of the decline was due to a 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, publicizing 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, even if they believed in the growth story. Then on June 17, Neuberger Berman LLC, a 6.3% holder in Charles River, announced its opposition to the acquisition. On June 18, Relational Investors LLC, a 4.0% owner, did the same. Charles River stock closed at $36.85, up 3.7% from two days before.

In a July 16 letter to the 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 again by 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 initial announcement, its stock price recovered a large portion of the drop associated with the initial announcement and had outperformed the S&P 500 index, which suffered a decline of 8.4% during the same period.

B: Top Players in Activist Risk Arbitrage

This table lists the players in our sample that invested in at least four merger targets (excluding appraisal appeals) during 2000-2014. Collectively they participated in 21.2% of all the deals.

Activist Risk Arbitrageur	Frequency	Rank
GAMCO Investors, Inc.	9	1
Ramius LLC	7	2
Millennium Management LLC	6	3
Elliott Associates, LP	5	4
SAC Capital Advisors	5	4
Dolphin Limited Partnership I, LP	5	4
First Eagle Investment Management	5	4
Carl C. Icahn	4	8
Carlson Capital, LP	4	8
Marathon Partners LP	4	8