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Responding to Activist Short Sellers: Allegations, Firm Responses, and Outcomes

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ABSTRACT

This study provides descriptive evidence on how firms respond to activist short seller reports and how these responses are associated with outcomes for the targeted firms. We show that the frequency of these reports has grown substantially in recent years. Although we find that firms respond only 31% of the time, this rate increases substantially when the report is accompanied by

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significantly negative abnormal returns and when the report contains new evidence. Not responding is associated with a less negative stock price response at report release and fewer adverse outcomes. Firms that launch internal investigations following the report release have significantly higher subsequent rates of stock exchange delisting and SEC enforcement actions, and lower rates of being acquired. Overall, our results highlight the impact of activist short sellers on target firms and that firm responses are associated with material outcomes.

JEL codes: D82, G14, G34, M41, M42, M48

Keywords: activist short sellers; internal investigations; fraud; voluntary disclosure; delisting; restatements

1. *Introduction*

We present descriptive evidence of target firms' responses to activist short seller reports. Activist short sellers are hedge funds or individuals who take short positions in a company's stock prior to publishing research reports that claim the target firm is overvalued. Their reports frequently allege accounting issues and fraud, and the reports are accompanied by significant negative abnormal stock returns on average and higher rates of outcomes, such as stock exchange delistings and SEC enforcement actions. It is important to understanding target firm responses to activist short seller reports because these reports have become increasingly prominent in recent years and they significantly impact targeted firms (e.g., Ljungqvist and Qian [2016], Jiang, Habib, and Hasan [2020]). Despite the growing importance of activist short sellers, little is known about how firms respond to these reports. We provide new evidence about the types of responses firms make when targeted by activist short sellers and associations among these responses and firm outcomes.

Our analysis proceeds in four steps. First, we collect an extensive sample of activist short seller reports and manually classify their allegations, including the presence of business and accounting issues, if the activist provides new evidence not already available in public filings, and if the activist alleges securities fraud. Our sample includes 351 activist short seller reports released between 1996 and 2018. We find that the number of short seller reports has grown substantially in recent years, from an average of 2.5 reports per year during the period 1996–2009, to 35 reports per year from 2010 to 2018.

Second, we collect and classify all observed firm responses to these reports. The most frequent type of response is a public denial of the activists' claims through a press release or conference call, which we observe in response to 28% of activist reports. Firms can make more than one type of response, and we also observe that firms provide additional information to investors (following 12% of reports), file or threaten to file lawsuits against the short seller (6% of reports), and launch internal investigations conducted by outside counsel (4% of reports). Overall, the firms in our sample respond to 31% of the activist reports using one or more of these approaches.

Our third area of analysis is to provide evidence on factors associated with the decision to respond. We find a strong relationship between the tendency of firms to respond and returns at the release of the short seller report. Firms that do not respond have insignificant abnormal returns on average at the report release, but a response becomes more likely when abnormal returns are more negative: only 24% of firms respond when their abnormal returns surrounding report release is in the highest three quartiles, increasing to 52% of firms responding for lowest quartile returns. Firms are also more likely to respond when the reports contain new information not already available in securities filings, a characteristic that Ljungqvist and Qian [2016] use to proxy for report credibility. Management may be better positioned to use the activist's report data to verify or refute the allegations more easily when the activist presents new evidence, compared to when the report is based on opinions based on the company's filings. Consistently, we find that firms are significantly less likely to respond when the activist's report only discusses overvaluation based on business issues and does not provide new evidence.

Our fourth and final area of analysis is whether firms' responses are associated with adverse outcomes, specifically, we consider stock exchange delisting, SEC Auditing and Accounting Enforcement Releases (AAERs), financial statement restatements, auditor changes, and being the target of an acquisition. Firms that launch internal investigations in response to the short seller report release are significantly more likely to be delisted, to receive an AAER, and are less likely to be acquired compared to other target firms that respond in other ways. Taken together, our study finds that firms' responses to activist short seller reports vary systematically with characteristics of the report and are associated with firm outcomes. The majority of firms do not respond to activist short sellers, and not responding is associated with a less negative stock price response to the report release and fewer adverse outcomes. Thus, the initial market response to the report appears to be an effective indicator of a report's merit.

Our results are relevant to several streams of academic research. We contribute to the limited literature on activist short sellers and firm responses to their reports. Lamont [2012] uses media reports of target companies engaging in lawsuits and related actions against short sellers between 1977 and 2002 and finds significantly negative abnormal returns following these media reports. However, Lamont [2012] is limited to firms that responded and were covered in the press, it does not examine factors associated with the decision to respond or outcomes for firms that do not respond. Ljungqvist and Qian [2016] examine a sample of all research reports from a set of activist short sellers, released between 2006 and 2011. They demonstrate that activist short seller reports presenting new information are associated with target company price declines, but they do not consider firm responses.

We provide new evidence on target firms' response decisions and the relation with firm outcomes, including more recent time periods when activist short seller reports have become more frequent and widely available to investors and the media through social media and other report distribution Web sites.

We also contribute to the literature on the duties of managers and directors to investigate allegations of wrongdoing. The legal literature describes the Delaware Doctrine standard for board members' fiduciary duties (Pan [2010]). Managers and directors must investigate credible red flags for fraud or other criminal activity, usually by meanse of an internal investigation conducted by outside counsel (e.g., Duggin [2003], Mark and Pearson [2007], Pearson and Mark [2007]). Firms use this structure to maintain the confidentiality of the internal investigation's findings by virtue of attorney–client privilege, giving the firm an option to waive privilege and reveal the information to the public or cooperate with authorities. To our knowledge, there are no extant studies providing empirical evidence on the determinants of internal investigations into fraud allegations or their association with firm outcomes. Our study provides evidence that firms responding to short seller reports by launching internal investigations are associated with higher subsequent rates of AAERs, delisting, are less likely to be acquired.

Finally, we contribute to the literature on accounting fraud, restatements, and related adverse outcomes. Miller [2006] examines AAER firms and finds that the press often reports accounting fraud prior to the firm or SEC revealing the information. Dyck, Morse, and Zingales [2010] examine various sources of fraud information, using short interest to infer the involvement of short sellers. We also consider other adverse events that are associated with negative returns upon their announcement, such as restatements (e.g., Palmrose, Richardson, and Scholz [2004]). We extend this literature by giving new evidence about the role of activist short sellers as information intermediaries, firm responses, and adverse outcomes.

2. *Background and Conceptual Framework*

2.1 TARGET FIRM RESPONSES TO ACTIVIST SHORT SELLERS

The term a*ctivist short seller* refers to hedge funds or individuals who disclose having a short position in a target company's stock. Activists establish a short position in target companies' shares prior to publishing their research reports describing the target firms' overvaluation. Ljungqvist and Qian [2016] provide evidence that these activists, despite having limited capital, are able to precipitate stock price declines with the publication of their research reports, indicating that the reports are on average effective. The activists intend to cover their short positions at a profit after the reports are released and the targets' stock price falls. Theory suggests that activist short sellers will make generally truthful reports, as a track record for accuracy is expected to increase the market response to subsequent reports, increasing the profitability of trading in advance of these reports in a repeated game. Benabou and Laroque [1992] show that the reporters' optimal strategy involves issuing false reports with nonzero probability. Mitts [2020] provides empirical evidence that anonymous short-oriented posting on chat boards contain such distorted reports, which aim to profit from the resulting temporary price declines.

Making false statements in a written research report is risky for short sellers, as it gives rise to potential securities fraud liability under SEC rule 10b-5.[1] Short sellers can also be sued for defamation by target firms (e.g., Lamont [2012], Mitts [2020]). Successful defamation claims require the target firm to prove four elements: that the short seller made a false statement purporting to be fact, communicated that false statement to a third party, that the false statement was negligent or malicious, and that the target firm suffered damages as a result.[2] Firms can sue short sellers for defamation even when the report is accurate, as a bluffing strategy to try and force the short seller to withdraw the report rather than incur the legal costs of defending the action. Short sellers have successfully defended themselves against defamation lawsuits by demonstrating that their analysis was either accurate or an expression of opinion rather than fact.[3]

Overall, the foregoing discussion suggests that activist short sellers are incentivized to provide generally accurate reports, but that some reports will be intentionally distorted. Therefore, firms may be able to influence investors and regulators by undertaking a response that credibly communicates that a report's allegations lack merit. Despite the increase in activist short seller reports in recent years, and evidence that activists have a significant impact on target firms' share price, there is little evidence about when firms respond and whether those responses are informative.

Our study is most closely related to Lamont [2012], who examines returns for a set of firms identified from media articles to have engaged in anti-shorting actions against short sellers, such as lawsuits. However, Lamont [2012] only looks at cases where the target firm's response was reported in the media, and so does not examine the response choice itself. Also, the Lamont [2012] sample is taken from media reports between 1977 and 2002, a period with little overlap with the modern concept of activist short selling, given the significant expansion of Internet publishing and social media distribution since 2002. Modern activists are now able to rapidly reach a wide audience and have a significant impact on target firms. Furthermore, Lamont [2012] considers stock returns following the media report, while we

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[1] "The Commission will vigorously investigate and prosecute those who manipulate markets with this witch's brew of damaging rumors and short sales," said SEC Chairman Christopher Cox. SEC Charges Wall Street Short seller with Spreading False Rumors (April 24, 2008), available at https://www.sec.gov/news/press/2008/2008-64.htm

[2] Overstock.com v. Gradient Analytics, 151 Cal.App.4th 688 (Cal. Ct. App. 2007) is an example of a successful defamation action brought against short sellers.

[3] GTX Global Corp. v. Left, 2007 WL 1300065 (Cal. Ct. App. May 4, 2007) is an example of a successful defense mounted by a short seller.

look at a range of adverse outcomes including AAERs, delisting, restatements, and being acquired, which represent significant events for targeted firms and its managers (e.g., Dechow et al., [2001]), Palmrose, Richardson, and Scholz [2004], Walsh [1989], Clark and Ofek [1994]). We also examine auditor changes as prior literature finds that auditors associated with fraud firms have higher litigation risk (Bonner, Palmrose, and Young [1998]).

The majority of prior research into short sellers has generally been based on indirect evidence of short seller activity, such as aggregate short interest. Heavily shorted firms experience negative abnormal returns indicating that short sellers are effective in identifying overvaluation (e.g., Dechow et al., [2001]), Asquith, Pathak, and Ritter [2005], Desai et al. [2002], Karpoff and Lou [2010]). Some direct evidence on large individual short positions has become available in the European setting, where public disclosure of these positions has been required since 2012. Jones, Reed, and Waller [2016] show that the initial disclosure of these short positions is followed by negative abnormal returns. However, research based on short interest as well as European evidence on individual short positions does not examine either the short sellers' rationale for shorting the target firms or the firms' responses.

2.2 INTERNAL INVESTIGATIONS CONDUCTED BY OUTSIDE COUNSEL

Firms are not obligated to respond to activist short seller reports. When credible allegations of fraud and misconduct are presented, the firm's directors have a fiduciary duty to investigate to protect the firm and its shareholders by maintaining oversight of the firms' compliance with laws and regulations. Pan [2010] describes the Delaware Doctrine standard for directors' fiduciary obligations. This standard directly applies to the 58% of listed firms that are incorporated in Delaware, and Bebchuk and Cohen [2003] show that Delaware corporation law strongly influences legislation and case law in other jurisdictions. Under the Delaware Doctrine, directors are only required to investigate potential wrongdoing when clear red flags regarding fraudulent or criminal activity are present. Investigations of business risk issues are not required, except in extreme cases (Pan [2010]).

Directors primarily exercise their fiduciary duty to investigate allegations of fraud and malfeasance by launching an internal investigation conducted by outside counsel. Duggin [2003] notes that the purpose of internal investigations is both to evaluate risk exposure and mitigate legal liability and potential penalties through cooperation with authorities. A key benefit of utilizing outside counsel is to protect the investigation's findings with attorney–client privilege, allowing the firm to avoid having to disclose any resulting findings either to shareholders or to authorities unless the firm elects to waive this privilege. Mark and Pearson [2007] and Pearson and Mark [2007] discuss the framework whereby prosecutors and government agencies encourage companies to cooperate with authorities and reveal the results of internal investigations with sentencing guidelines that favor cooperation. However, Leone, Li, and Liu [2020] provide empirical evidence

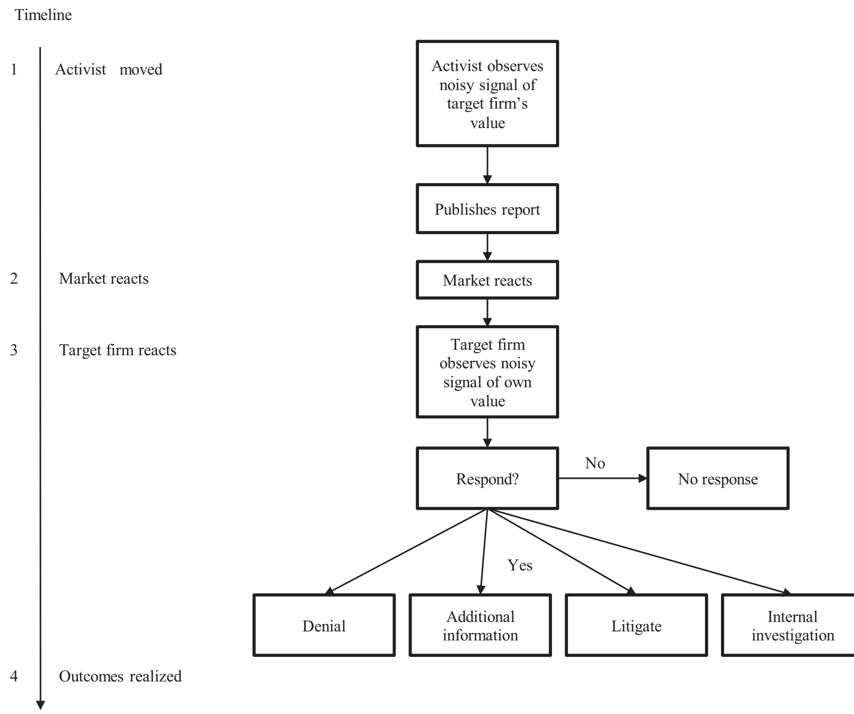

FIG 1.—Timeline.

from SEC enforcement actions that target firm cooperation is associated with higher penalties. This conflicting empirical result could reflect that firms cooperate when they have engaged in more severe misbehavior, or it may reflect that cooperation is not rewarded in practice. The literature does not currently provide empirical evidence about the decision to conduct internal investigations or the relation of investigations to short seller activity and firm outcomes.

2.3 CONCEPTUAL FRAMEWORK

The timeline of the moves made by the activist and the target firm is illustrated in figure 1. At time 1, the activist observes a noisy private signal about the target firm's value and issues a report indicating the firm has a low value. There exists an equilibrium that maximizes expected profits for the activist where a fraction of reports are strategically distorted, indicating low value when in fact the activist's private signal indicated high value (Benabou and Laroque [1992]).

At time 2, the market responds to the activist's report with a negative abnormal return if the report presents credible new information. At time 3, the target firm observes the market reaction to the activist's report and its own private signal of firm value. As there is an expectation that not all reports are accurate, there is scope for the firm to respond to try and persuade investors to discount the activist's report. The motivation to respond arises from the firm's interest in reversing a stock price decline that followed the release of the report. Responding managers may also want to forestall an enforcement investigation that might arise from the report's allegations. The SEC performs a cost-benefit analysis before deciding to open an investigation, including factors such as the potential monetary penalties and the cost to mount an investigation in the decision to proceed (Dechow et al. [2011], Blackburne et al. [2020]). A response that signals the firm is innocent or will be costly to pursue may therefore deter an investigation.[4]

In cases when the firm's share price does not decline significantly, the firm has little incentive to respond. In some instances, the firm may not even notice that the report was released. If the firm is aware of the report, there is relatively little benefit to responding, as there is no share price decline to try to reverse. Responding carries both direct costs to create and disseminate a public statement and gives rise to liability if the statement is ultimately found to contain errors. Finally, acknowledging the report can be counterproductive if it signals that the firm believes the activist is sufficiently important to warrant a response, thereby increasing the activist's credibility.

If the firm's share price declines following the report's release, it is more likely that the firm's managers will become aware of the report, and this naturally gives rise to a higher probability of responding in some way. When the activist provides data and logical conclusions, and the firm has the ability to verify and dispute the data, a clear denial of the activists' claims is feasible, both to try and repair the share price decline and to forestall regulatory action. When managers are more certain their information is accurate, they should face a lower risk of making a false statement, and thereby be more likely to respond. Another important response seen in Lamont [2012] is to threaten or initiate a lawsuit against the short seller, which benefits the firm by winning damages if it prevails in the lawsuit. Lawsuits are costly, however, involving a significant investment of time and resources, and requires the firm to reveal potentially sensitive information to the activist in the discovery process and to the public if the case proceeds to trial. Litigation in this scenario, when the firm believes the activist's report is false, presents a costly and, therefore potentially credible signal that the activist's report is false.

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[4] General Electric Company (GE) presents an illustrative anecdote: in August 2019, analyst Harry Markopolos published a report alleging accounting fraud at GE, and the shares fell 11% on the day the report was released. GE responded with a rebuttal of the activists claims and the stock price subsequently recovered. However, the SEC was not dissuaded from investigating, and subsequently found that GE engaged in securities violations related to issues raised in the Markopolos report. In December 2020, GE agreed to pay a $200 million penalty to settle the resulting action (AAER 4194, available at https://www.sec.gov/litigation/admin/2020/33-10899.pdf, retrieved February 21, 2021).

There are nevertheless incentives not to respond. First, the activist may simply report opinions of overvaluation based on an interpretation of the firm's public filings. The firm cannot dispute the source or accuracy of the information, and again acknowledging the activist by engaging in lends the activist credibility. Second, managers may not have high confidence in their position, and avoid responding if the risk of making a false statement is material, which could open them up to liability. A negative stock price reaction may inform managers and directors that the report contains important information, reducing their certainty about the true state of their firm (e.g., Edmans, Goldstein, and Jiang [2015], Zuo [2016]).

When the market declines following the publication of the short seller's report, and the firm's private signal indicates that the allegations are accurate, the decision not to respond is more attractive than revealing the truth because investors only place a partial weight on the activist's allegations (Benabou and Laroque [1992]). Empirically, we do not observe any disclosures in our sample that simply acknowledge the veracity of the short seller's allegations.[5] The firm's managers could choose to issue their own false report, a material possibility when management is involved in a fraud, as the additional liability for an additional false statement may be small relative to the existing liability. The firm may respond by suing the short seller for defamation as a bluffing strategy, and if the activist has insufficient financial resources to mount a legal defense, they may be forced to settle by agreeing to retract the report. A litigious target firm also signals to regulators and other short sellers that the firm is an expensive target to pursue, reducing the odds that authorities launch an investigation into the firm's activities (Dechow et al. [2011], Blackburne et al. [2020]).

The approach most consistent with the fiduciary duties of independent directors is to launch an internal investigation in cases when the allegations present sufficient red flags to management and/or the board of directors to trigger a duty to investigate (Pan [2010]). It is unlikely that firms conduct such investigations as a routine matter to respond to frivolous allegations, because internal investigations are costly, both in terms of management attention and in terms of out-of-pocket costs for outside law firms to conduct extensive interviews with staff and conduct forensic audits of the firm's books and records. These costs become warranted when the firm expects to benefit materially from either using the findings to secure reduced penalties through cooperation or to mount a vigorous defense (Duggin [2003], Mark and Pearson [2007]).

[5] We are aware of one such example outside of our sample. Let's Gowex SA CEO made just such an admission immediately after publication of a report from Gotham City Research. "I made a voluntary confession … I will face the consequences," from the *Financial Times*, "WiFi provider Gowex goes bankrupt and admits falsifying accounts," Buck, T. July 7, 2014. Although Gotham City Research is an activist short seller in our sample, Let's Gowex is not included because it was not listed in the United States.

Internal investigations are unlikely to be a credible commitment to disclose the investigation's findings because the structure includes outside counsel specifically to avoid having to disclose the results, under the protection of attorney–client privilege. The internal investigation then affords the firm an option to either maintain confidentiality or to waive privilege and provide the results to interested parties, such as shareholders or the authorities (Mark and Pearson [2007]).[6] Therefore, we predict that firms launch internal investigations when the firm's directors either have significant uncertainty about whether or not fraud has taken place or suspect that fraud has occurred, and the purpose of the investigation is to limit liability and penalties.

At time 4, the accuracy of the activist's report is revealed. We use various firm outcomes to proxy for the report's accuracy. Exchange delisting is evidence of lack of compliance with listing standards, and materially increases the firms' cost of capital (e.g., Schumway [1997]). Allegations of fraud can be validated by subsequent AAERs (e.g., Dechow, Sloan, and Sweeney [1996], Dyck, Morse, and Zingales [2010]). Target firms may resort to seeking strategic alternatives, that is, being acquired, which we do not consider to be a good or bad outcome per se. On one hand, being acquired is material to the firm, represents a potential distress outcome, and often results in managers' employment being terminated (Walsh [1989], Clark and Ofek [1994]). On the other hand, an acquisition implies that an acquirer believes the target firm has sufficiently valuable assets and limited liabilities to be an attractive purchase. In either case, however, it is a significant event for the firm because its existence as an independent entity ends.

Overall, this discussion indicates that several response types are supportable both when the firm believes the activist's report is correct or not. Denials and lawsuits can be an appropriate course of action in either case. The foregoing discussion does provide two clear empirical predictions: First, making any type of response is more likely when there is a significant negative abnormal return around the publication of the activist's report as the firm is more likely to be aware of these reports and has the incentive to try and reverse the price decline and forestall enforcement inquiries. Second, the launching of an internal investigation is more likely when the short seller allegations credibly relate to fraud or other criminal activity and present the target's board of directors with sufficiently compelling red

[6] In addition to confirming this prediction in discussions with a partner at a leading activist defense law firm and general counsel at a publicly traded company, industry publications highlight that "…internal investigation protected by the attorney-client privilege can benefit the company in a number of ways" including "insulating management and/or the board…". ("Corporate Internal Investigations: Best Practices, Pitfalls to Avoid" Jones Day, 2013.) Available at https://www.jonesday.com/en/insights/2013/01/corporate-internal-investigations-best-practices-pitfalls-to-avoid (Retrieved February 15, 2021)

flags to trigger a duty to investigate, and we expect internal investigations to be associated with significant firm outcomes.

3. *Data and Overview*

3.1 SAMPLE CONSTRUCTION

We start with the sample of activist short seller reports used in Ljungqvist and Qian [2016] that includes 126 reports from 17 short sellers from 1994 to 2011. This sample was created by selecting all reports published by all known professional short sellers that satisfied three criteria: the report makes public claims of overvaluation, discloses that the short seller has a short position in the targeted firm, and is made available to the public either on the activist's own Web site or through a publicly accessible Web site, such as Seeking Alpha. The short seller must have released more than one report to be included in the sample. We extend this sample using the same methodology to include additional short sellers who issue multiple reports through 2018.

Our extended sample consists of 421 initial short selling reports by 25 repeat short sellers from 1996 to 2018. We limit our search to U.S.-listed targets to provide for a consistent legal, regulatory, and market framework so that our outcome measures, including delisting and enforcement activities, are consistently applied. Excluding 33 unlisted firms and another 37 that lack the financial data needed to compute our control variables, we obtain a final sample of 351 initial reports on unique activist-company events. We manually verify that we have captured all reports issued by these short sellers using the short sellers' Web sites, the Internet Archive, and the platforms on which the short sellers' reports are distributed, including SeekingAlpha. Of the 351 reports in our sample, 56 are published by anonymous authors, and in untabulated tests, we do not find evidence that anonymity is associated with differences in response rates or outcomes.

After collecting all initial reports, two research analysts coded the allegations made in the reports according to our coding manual that is illustrated with an example report in online appendix A. One or both of the authors reviewed the coding of every report. We observe and record the following major categories of allegations: accounting issues (i.e., issues with revenues, expenses, income, cash flows, assets, liabilities, non-GAAP presentations, auditor issues), disclosure issues (incomplete disclosures, serious errors in disclosures), product and business issues (product quality, Ponzi schemes, inherently unprofitable products, related party transactions, fabricated customers, poor acquisitions or divestitures), management issues (past frauds, management turnover, competence). We also code an indicator variable for short sellers' specific allegation that the firm is committing securities fraud, (e.g., "… management of Textura is committing FRAUD [sic] on the investing public"). Finally, we code the activist reports with an indicator variable for reports that include new information, as opposed to basing the analysis only on the company's SEC filings. Such new information typically arises when the short seller provides material gathered using private investigators or from local or foreign regulatory filings that are not readily available online. We combine the report characteristics data with returns data from CRSP, financial statement data from Compustat, and media counts from FactSet.

We collect the target firms' responses to the short seller reports by searching for press releases and news articles from Factiva, conference call transcripts from Thomson Reuters Eikon, litigation from Audit Analytics, and 8-Ks from EDGAR. After observing the complete set of responses from these sources, we categorized the responses according to the criteria described in online appendix B. The responses that we observe belong to one or more of five categories. First, firms issue denials of the accuracy of allegations made by the short seller. Second, the firm may disclose additional information, to respond to or rebut the activist's allegations. Third, the target firm may threaten or file a lawsuit against the short seller. Fourth, the firm may announce an internal investigation into the short seller's allegations, conducted by outside counsel. We record an indicator variable for each type of publicly disclosed response made by the firm if it occurs within two weeks of the short seller report date and addresses the report or any allegations made in the report. We record a fifth category, no response, if the firm does not take any of these actions.

Data on firm outcomes were collected from several sources: AAER data are from the USC Leventhal School of Accounting and is described in Dechow et al. [2011]. Delisting and acquisition outcomes are from CRSP, and restatements and auditor changes are from Audit Analytics.

3.2 DESCRIPTIVE STATISTICS

Table 1 presents descriptive statistics for the activist short sellers and report characteristics. Panel A presents descriptive statistics for each of the activists in our sample. The mean CAR from one day prior to the report's issuance through 60 days following the report issuance is −17%, broadly consistent with the returns observed by Ljungqvist and Qian [2016]. Figure 2 plots the average cumulative abnormal returns surrounding the activist report release. The significant price decline at the time the report is released is consistent with prior research into the effect of activist short seller reports on target firm returns (Ljungqvist and Qian [2016], Appel and Fos [2020]). We find significant positive cumulative abnormal returns over the 90 days preceding the report's disclosure, consistent with short sellers screening for stocks that might be overvalued based on recent price increases and stock promotions (Aggarwal and Wu [2006]).

We find that firms respond in at least one way to 31% of short seller reports. We also observe variation in report characteristics, depending on the activist, with some alleging fraud in 100% of reports, others in as few as 27% of reports. The presentation of new evidence varies by activist from 0% to 100%. Target firm response rates vary from 0% to 86%. Overall, the

TABLE 1

Descriptive Statistics of Activist Short Sellers and Report Allegations

Panel A: Activist short seller characteristics

#	Activist Short Seller	# of Reports	*Fraud Allegation*	*New Evidence*	*Any Response*	*Mean CAR [−1, +60]*
1	Spruce Point	42	0.64	0.93	0.21	−0.14
2	Richard Pearson	41	0.59	0.56	0.15	−0.19
3	GeoInvesting	34	0.47	0.35	0.32	−0.26
4	Citron Research	29	0.41	0.59	0.34	−0.23
5	Asensio & Co.	24	0.46	0.00	0.50	−0.33
6	Kerrisdale Capital	23	0.30	0.35	0.26	−0.25
7	Bleecker Street Research	17	0.59	0.59	0.12	−0.24
8	Pump Stopper	17	0.82	0.88	0.18	−0.25
9	Muddy Waters	16	0.75	0.88	0.75	−0.19
10	Bronte Capital	15	0.47	0.00	0.13	−0.09
11	Prescience Investment	14	0.64	0.93	0.50	−0.09
12	Xuhua	11	0.27	0.27	0.09	−0.12
13	Aurelius Value	9	0.78	0.78	0.67	−0.23
14	Shareholder Watchdog	9	0.33	0.11	0.00	−0.25
15	Glaucus Research	7	0.29	0.57	0.86	−0.21
16	Gotham City Research	7	0.57	1.00	0.71	−0.27
17	Alfred Little	6	0.83	0.83	0.50	−0.18
18	Chimin Sang	5	0.40	0.40	0.20	−0.16
19	Street Sweeper	5	0.40	0.00	0.00	0.45
20	Absaroka Capital Management	4	0.75	1.00	0.75	−0.18
21	Anonymous Analytics	4	0.50	0.50	0.75	−0.01
22	Chinese Company Analyst	4	1.00	0.00	0.00	−0.11
23	The Emperor Has No Clothes	3	0.33	0.67	0.00	2.49
24	Viceroy Research	3	0.33	1.00	0.00	0.05

(*Continued*)

TABLE 1—*(Continued)*

Panel A: Activist short seller characteristics

#	Activist Short Seller	# of Reports	*Fraud Allegation*	*New Evidence*	*Any Response*	*Mean CAR [−1, +60]*
25	ForensicFactor	2	0.50	1.00	0.50	−0.31
	Total	351	0.54	0.55	0.31	−0.17

Panel B: Report allegation characteristics

Allegation Topic	Mean (Incidence)
Accounting issues	**1.82 (0.65)**
Audit and internal control	0.39
Revenues	0.30
Assets	0.28
Income	0.26
Cash flows	0.17
Expenses	0.16
Liabilities	0.13
Non-GAAP	0.12
Disclosure issues	**0.84 (0.65)**
Serious errors in disclosure	0.46
Incomplete disclosures	0.38
Business issues	**1.38 (0.87)**
Business	0.74
Product	0.36
Acquisitions and divestures	0.28
Management issues	0.58

(*Continued*)

TABLE 1—*(Continued)*

Panel B: Report allegation characteristics

Allegation Topic	Mean (Incidence)
Securities fraud	0.54
New evidence	0.55
Total	5.71

Panel C: Descriptive statistics of report allegation bundles

		Bundle Characteristics					
	Number of Reports	*Accounting Issues*	*Disclosure Issues*	*Business Issues*	*Management Issues*	*Securities Fraud*	*New Evidence*
All issues	84	X	X	X	X	X	X
Business issues only	34			X			
All issues except securities fraud	23	X	X	X	X		X
Accounting and business issues only	16	X		X			
All issues except new evidence	14	X	X	X	X	X	
Business issues and new evidence only	13			X			X
Others, ≥5 obs.	10		X	X	X	X	

(*Continued*)

TABLE 1—*(Continued)*

Panel C: Descriptive statistics of report allegation bundles

	Number of Reports	Bundle Characteristics: *Accounting Issues*	*Disclosure Issues*	*Business Issues*	*Management Issues*	*Securities Fraud*	*New Evidence*
	10	X	X	X			X
	9		X	X			
	8	X		X	X	X	X
	8	X	X	X	X		
	8	X	X	X			
	8		X	X		X	
	7	X	X	X		X	X
	6	X	X		X	X	X
	6		X	X	X	X	X
	5			X	X	X	X
	5			X	X		
Others, <5 obs.	77						
Total	351						

Panel D: Report characteristics by year

Year	# of Reports	*Any Response*	*New Evidence*	*Securities Fraud*	*Accounting Issues*	*Disclosure Issues*	*Business Issues*	*Management Issues*
1996	2	0.50	0.00	0.50	0.50	0.50	1.00	0.00
1997	1	1.00	0.00	0.00	0.00	1.00	1.00	1.00
1998	6	1.00	0.00	0.83	0.33	0.83	0.83	0.50
1999	2	1.00	0.00	0.00	0.50	1.00	1.00	0.00
2000	–	–	–	–	–	–	–	–
2001	4	0.00	0.00	0.50	0.25	0.50	0.75	0.25
2002	-	–	–	–	–	–	–	–

(*Continued*)

TABLE 1—*(Continued)*

Panel D: Report characteristics by year

Year	# of Reports	*Any Response*	*New Evidence*	*Securities Fraud*	*Accounting Issues*	*Disclosure Issues*	*Business Issues*	*Management Issues*
2003	1	0.00	0.00	0.00	0.00	0.00	1.00	0.00
2004	1	0.00	0.00	1.00	1.00	1.00	1.00	1.00
2005	1	0.00	0.00	0.00	1.00	1.00	0.00	0.00
2006	1	0.00	0.00	1.00	0.00	0.00	0.00	0.00
2007	4	0.00	1.00	0.50	1.00	1.00	0.25	1.00
2008	4	0.25	0.75	0.25	0.50	0.25	1.00	0.75
2009	7	0.14	0.00	0.14	0.57	0.43	0.86	0.29
2010	24	0.13	0.38	0.46	0.67	0.63	0.83	0.42
2011	48	0.46	0.60	0.60	0.79	0.77	0.75	0.69
2012	20	0.40	0.60	0.60	0.65	0.60	0.95	0.65
2013	42	0.31	0.45	0.38	0.64	0.55	0.86	0.55
2014	46	0.17	0.72	0.65	0.59	0.59	0.87	0.63
2015	40	0.28	0.48	0.53	0.63	0.65	0.95	0.63
2016	29	0.38	0.59	0.52	0.66	0.55	0.93	0.62
2017	36	0.36	0.67	0.58	0.69	0.78	0.94	0.58
2018	32	0.25	0.75	0.63	0.66	0.69	0.97	0.53
Total	351	0.31	0.55	0.54	0.65	0.65	0.87	0.58

In panel A, the sample contains details of the 351 reports from 25 activist short sellers on U.S.-listed target firms from 1996 to 2018, with available data to calculate required control variables. Fraud allegations, new evidence and any response are the proportion of reports that allege securities fraud, that present new evidence, and to which companies respond to the short seller's allegations via press releases, conference calls, or Form 8-K filings, respectively. See appendix A for variable definitions. For panel B, Appendix A provides detail regarding the frequency at which the short seller makes allegations addressing various topics among our sample of 351 short seller reports. *Mean* reports the average number of times a topic occurs per report across the sample, for example there are an average of 1.82 accounting issues per report. For topic areas with various subtopics that we code, we also report the *incidence* or rate of occurrence, reported in parentheses, for at least one of the subtopics, for example, 65% of reports contain at least one accounting issue. Panel C presents the number of analyst reports that correspond to the indicated set of characteristics, which comprise the topics discussed in the report, allegations of securities fraud, and the presence of new evidence. Panel D provides annual descriptive statistics of report characteristics and topic incidence for the 351 reports in the sample.

FIG 2.—Cumulative abnormal returns around report releases.

activists appear to be a heterogeneous group of investors that make varied allegations and engender different response rates.

Panel B of table 1 presents the frequency of the various allegations and issues we observe in the activist reports. On average there are 5.71 different issues raised per report, including 1.82 accounting issues and 1.38 business issues. At least one business issue occurs in 87% of reports, and accounting issues occur in 65% of reports. Overall, fraud is alleged in 54% of reports and new evidence is presented in 55% of reports.

Panel C of table 1 presents descriptive statistics on the most commonly bundled sets of allegations present in short seller reports, which helps to understand the scope and style of typical reports. The most common bundle of allegations, comprising 84 of the 351 activist reports in the sample, includes all categories of allegations and provides new evidence. This report style could reflect that the short seller identified serious and fundamental flaws in all aspects of the business, presenting a particularly compelling case of overvaluation including allegations of fraud. The strategy might also be designed to lessen the risk of a defamation claim by making a large number of claims, only some of which need to be true for a reasonable defense. The second most common bundle contains only allegations of overvaluation based on business issues, without giving any new information.

Panel D of table 1 provides descriptive evidence of the evolution of the activist report sample over time. We provide evidence that the number of reports issued increased dramatically in recent years, in particular since 2009. Although we do not attempt to identify underlying causes for this rise in activism, we note that the distribution of activist reports using social media, in particular Seeking Alpha (founded in 2004) and Twitter (founded in 2006) likely increases the reach and publicity of existing activist short sellers,

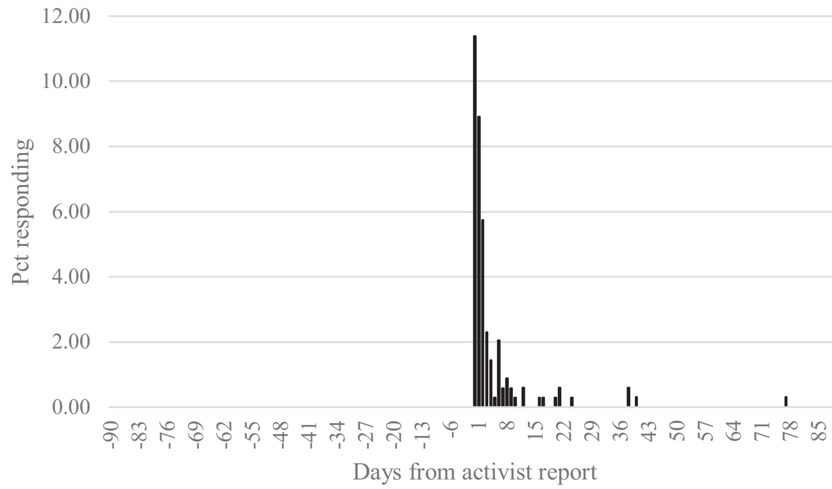

FIG 3.—Target firm responses around report releases.

encouraging more analysts to release short-oriented reports. Prior to social media distribution, activists primarily relied on their own Web sites and in some cases the financial press to rebroadcast their analyses. The target firm response rate has varied from 13% to 46% of reports each year, with an overall average response rate of 31%. We find that the prevalence of new information has become a significant feature of activist short seller reports only since 2007. A general movement by governments and private enterprise to make more data available online in recent years likely provided greater access to new evidence for short sellers.

Table 2 provides descriptive statistics about the target firm's responses and outcomes. Panel A shows that the response rate also varies among firms associated with different outcomes. Only 6% of AAER firms respond to the reports, while 47% of firms that do not have a significant outcome respond, giving initial indications that responses may be associated with less severe outcomes.

To provide descriptive evidence of when firms respond to the activist reports, in figure 3, we plot a histogram of the firm responses relative to the report release day. Most responses happen during the first week following the activist report, with relatively few responses observed more than two weeks following the report release.

Panel A of table 2 shows that 25% of target firms are delisted following the activist report release, and in figure 4 we plot the histogram of delisting events relative to the report release day. This figure illustrates that some firms are suspended from trading and delisted as soon as the same day

TABLE 2

Descriptive Statistics of Firm Responses

Panel A. Cross-tabulation of target firm response and outcomes

Disclosure Type Target Firm Response	Target Firm Outcome *All Outcomes*	*AAER*	*Delisting*	*Acquired*	*No Severe Outcome*	*Auditor Change*	*Restatements*
Denial	0.28	0.03	0.26	0.22	0.49	0.06	0.10
Lawsuit	0.06	0.00	0.50	0.10	0.40	0.05	0.05
Internal investigation	0.04	0.29	0.50	0.07	0.14	0.21	0.29
Additional disclosure	0.12	0.02	0.30	0.23	0.44	0.05	0.12
Any response	0.31	0.06	0.26	0.22	0.47	0.06	0.12
No response	0.69	0.07	0.24	0.15	0.55	0.07	0.17
All reports	1.00	0.06	0.25	0.18	0.51	0.07	0.15

Panel B. Abnormal returns by response type

	Mean CAR [−1,+1]	[+2,+60]	[+2,+252]	[−1,+252]
Denial	-0.14^{***}	-0.16^{***}	-0.30^{***}	-0.37^{***}
Lawsuit	-0.16^{**}	-0.17^{**}	-0.39^{***}	-0.46^{***}
Internal investigation	-0.24^{***}	−0.18	−0.27	-0.35^{**}
Additional disclosure	-0.13^{*}	-0.11^{*}	-0.23^{**}	-0.32^{**}
Any response	-0.14^{***}	-0.15^{**}	-0.29^{***}	-0.36^{***}
No response	0.00	-0.13^{***}	-0.31^{***}	-0.31^{***}
All reports	-0.04^{***}	-0.14^{***}	-0.30^{***}	-0.34^{***}

Continued

TABLE 2
Continued

Panel C. Characteristics of responding and nonresponding firms

Comparison of Response and No Response Firms

Variables	Response Firms	No Response Firms	Difference in Mean
Market cap	2,309.46	2,209.43	100.03
BTM	0.44	0.45	−0.01
Q	3.74	4.00	−0.26
ROA	−0.01	−0.12	0.11***
Leverage	0.17	0.14	0.02
Dividend yield	0.01	0.01	0.00
Analysts	1.42	1.45	−0.03
Institutional ownership	0.34	0.36	−0.02
Litigation risk	0.30	0.37	−0.07
Manipulator	0.36	0.24	0.11
IPO	0.17	0.15	0.01
Foreign	0.46	0.36	0.10
Short interest	0.07	0.07	0.00
Pre-AAER	0.01	0.03	−0.02
Pre-restatement	0.43	0.00	0.43
Pre-auditor change	0.57	0.56	0.01

Panel A relates the fraction of events by each combination of target firm response and target firm outcome for our sample of 351 short seller reports to firm outcomes. See appendix A for variable definitions. Panel B presents average cumulative abnormal returns (CARs) over the three days surrounding report release days [−1,+1], the subsequent three-month [+2,+60], and year [+2,+252] periods, and the entire period, [−1/+252]. Statistical significance on the abnormal returns is based on a *t*-test of the mean difference from zero. Panel C provides the mean values for characteristics of responding ($N = 109$) and nonresponding events ($N = 242$). Statistical significance is based on a *t*-test of the mean difference from zero.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

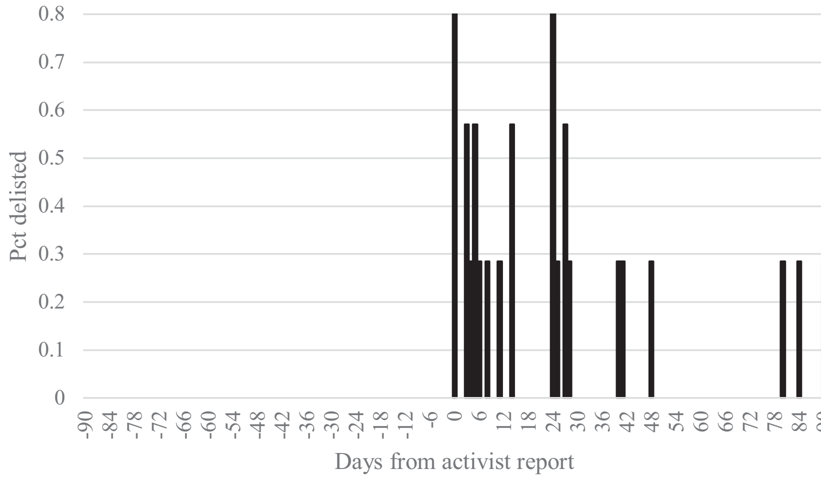

FIG 4.—Targeted firm delisting around report releases.

the activist report is released.[7] The rate of delisting proceeds at a rate of 0.28–0.85% of target firms per day over the two weeks following the report release. Although the overall percentage of firms affected on a daily basis is small, the cumulative delisting of 25% of target firms provides evidence that targeted firms frequently violate listing standards.

Panel A of table 2 also illustrates the fraction of firms electing to use each of the various response categories, with univariate outcome rates tabulated for each response option. 31% of firms respond with at least one of the categories we observe. The most common response is a denial of the activist claims, an action taken following 28% of activist reports. Overall, 12% of firms provide additional disclosures, 6% threaten or file lawsuits against the short seller, and 4% launch internal investigations.

Of firms that launch internal investigations, 29% have subsequent AAER enforcement actions, more than four times the overall of 6% for the sample. Interestingly, these firms that receive fraud actions make denials in response to only 3% of activist reports, compared to a 28% denial rate for the full sample. These firms provide additional information in only 2% of activist reports, compared to a 12% rate for all reports. Collectively, this indicates that firms with subsequent fraud findings are much more likely to launch internal investigations and much less likely to make statements that

[7] When we manually inspect the reasons for rapid delistings following the short seller report, we find that they are initiated by the NYSE or NASDAQ exchanges on a discretionary basis "for the protection of investors" (e.g., NASDAQ Listing Rule 5101, and Section 1009(d) of the NYSE Company Guide), and the determination is supplemented by other listing rules such as for failure to provide adequate responses to exchange inquiries, or failure to file required forms with the SEC when due.

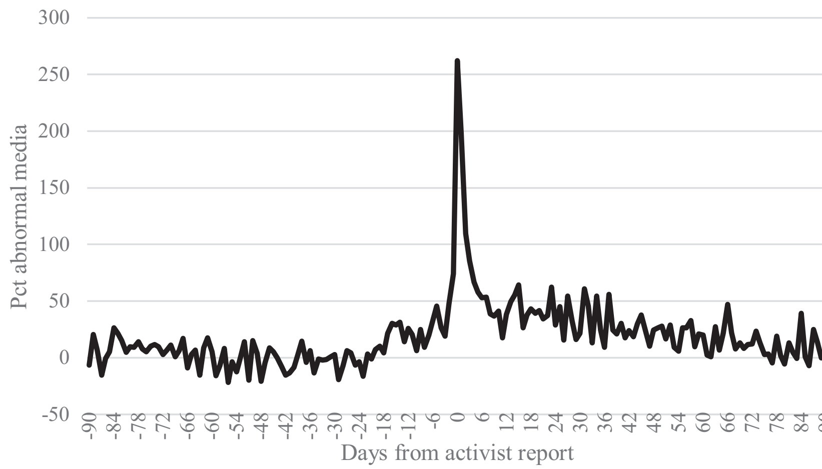

Fig 5.—Abnormal media mentions around report releases.

could create additional liability for the firm. Firms launching internal investigations are acquired at a rate of 7%, less than half the 18% rate for the overall sample, and are twice as likely to be delisted, at a rate of 50%, compared to the sample average of 25%, indicating that these firms are harder to value or may bring significant liabilities to an acquirer. We confirm the statistical significance of several of these univariate results in multivariate tests below.

Panel B of table 2 tabulates the univariate association between response options and abnormal returns. Consistent with our predictions, the market response to the short seller's report publication is associated with response choices. The mean announcement return over the three days surrounding the report release (*CAR[−1,1]*) for all reports is −4%, the mean return associated with response firms is −14%, and the mean return for no-response firms is 0%, suggesting that firms targeted with unfounded reports optimally choose not to respond. Firms that launch internal investigations have announcement returns of −24%, indicating that the set of reports associated with internal investigation firms provided material new information. The application of the Delaware Doctrine implies that these reports raised sufficient evidence of red flags for fraud or other wrongdoing among the target firms' management and/or directors to trigger a duty to investigate.

Figure 5 plots average abnormal media attention, with media mentions spike more than 261% on the day of the report's disclosure, suggesting that the activists in our sample are able to reach a wide audience on average, and these reports are likely to gain the attention of investors and managers.

Panel C of table 2 provides descriptive statistics of the firm characteristics for responding and nonresponding firms. The univariate difference in firm characteristics is generally statistically insignificant, except for profitability, with responding firms being more profitable (return on assets [*ROA*] of −0.01) compared to nonresponding firms (*ROA* of −0.12), indicating that responses are likely related to the characteristics of the report, rather than observable characteristics of the firm.

4. The Activist Short Seller's Targeting Decision

In table 3, we provide a descriptive analysis of the types of firms targeted by activist short sellers. We provide new evidence about the characteristics of target firms, using a probit regression including all listed firms in CRSP and Compustat with the necessary data availability to calculate all the covariates, from 1996 to 2018. The dependent variable is an indicator equal to 1 for firm-years with an activist report in our sample, and 0 otherwise.[8]

Panel A of table 3 provides descriptive statistics for targeted firms and the Compustat universe. Firms targeted by short sellers are smaller than the Compustat average in the mean ($2,241 million for targeted firms vs. $3,847 million for the full sample) but are somewhat larger using the median, at $531 million for targeted firms compared to $283 million for all firms. Targeted firms are different on other dimensions, consistent with prior literature on overvaluation, short sellers, and fraud: they have lower book-to-market ratios, lower leverage, are more likely to be foreign-headquartered, have higher short interest, higher Tobin's *Q*, and are more likely to be earnings manipulators (e.g., Beneish [1999], Lee, Li, and Zhang [2015], Dechow, Sloan, and Sweeney [1996], Dechow et al. [2001]).

Panel B of table 3 presents a probit regression with a dummy variable for being targeted as the dependent variable, and the inferences are generally consistent with panel A, although size is not a statistically significant targeting factor in the multivariate regression. Panel B confirms that targeted firms have higher Tobin's *Q* and lower profitability than the Compustat average. These coefficients have the opposite sign compared to the targeting decision for long activists studied by Brav et al., [2008], who aim to identify undervalued firms. Overall, short sellers appear to target firms with traditional indications of overvaluation, as target firms are significantly more likely to be labeled as manipulators using the *M*-score, to have recently undergone an IPO, and to be foreign. These factors are associated with the potential for fraud and distorted earnings (Beneish [1999], Lee, Li, and Zhang [2015]). Targeted firms have higher short interest, which is associated with greater limits to arbitrage, and therefore, the publication of a report is a more attractive way to resolve the overvaluation of these firms in a short period of time (Ljungqvist and Qian [2016]).

[8] In a contemporaneous working paper, Appel and Fos [2020] conduct a test of activist short seller targeting, using predictor variables based on Brav et al. [2008], and find that short interest, Tobin's *Q*, and size are associated with activist reports. Because we expect long and short activists look at different factors, we include variables that are shown in the prior literature to be associated with accounting manipulation, fraud, and restatements.

TABLE 3

Activist Short Seller Target Firm Characteristics

Panel A: Characteristics of target companies

Firm Characteristics	Mean	SD	Lower Quartile	Median	Upper Quartile	Mean of Compustat/CRSP Universe	Mean Diff. – *p*-Value	Median of Compustat/CRSP universe	Median Diff. – *p*-Value
Market cap	2,240.50	6,398.61	189.88	531.31	1,358.14	3,846.52	0.00	283.19	0.00
BTM	0.45	0.66	0.15	0.31	0.54	0.64	0.00	0.51	0.00
Leverage	0.15	0.20	0.00	0.05	0.26	0.22	0.00	0.17	0.00
Analysts (log)	1.44	1.00	0.69	1.61	2.20	1.23	0.00	1.10	0.01
Institutional ownership	0.35	0.35	0.01	0.23	0.65	0.33	0.32	0.23	0.06
Foreign	0.39	0.49	0.00	0.00	1.00	0.13	0.00	0.00	0.00
Litigation risk	0.35	0.48	0.00	0.00	1.00	0.23	0.00	0.00	0.00
Short interest	0.07	0.07	0.01	0.04	0.10	0.02	0.00	0.00	0.00
Q	3.92	4.01	1.55	2.48	4.61	2.47	0.00	1.53	0.00
Dividend yield	0.01	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.09
ROA	−0.08	0.39	−0.13	0.03	0.13	−0.04	0.03	0.02	0.00
Manipulator	0.28	0.45	0.00	0.00	1.00	0.16	0.00	0.00	0.00
Pre-AAER	0.02	0.15	0.00	0.00	0.00	0.05	0.28	0.00	0.46
Pre-restatements	0.48	0.50	0.00	0.00	1.00	0.01	0.00	0.00	0.00
Pre-auditor change	0.56	0.50	0.00	1.00	1.00	0.05	0.00	0.00	0.00
Earnings announcement	0.14	0.35	0.00	0.00	0.00	–	–	–	–
Avg. pre-returns	0.01	0.34	−0.09	−0.03	0.02	–	–	–	–
CAR[−1,+1]	−0.04	0.61	−0.14	−0.06	−0.01	–	–	–	–
CAR[+2,+60]	−0.14	0.31	-0.32	−0.14	0.03	–	–	–	–
CAR[+2,+252]	−0.30	0.48	−0.68	−0.41	0.02	–	–	–	–

Continued

TABLE 3
Continued

Panel B: Probit analysis of targeting

Dependent Variable:Dummy (of Being Targeted)	Coefficient	z-Value	Marg. Prob. (%)
Log market cap	0.01	0.78	0.0%
BTM	−0.09*	−2.12	−0.06%
Q	0.02**	3.22	0.01%
ROA	−0.16*	−2.42	−0.10%
Leverage	−0.45***	−4.42	−0.28%
Dividend yield	−2.81**	−2.75	−1.77%
Analysts	0.02	0.81	0.01%
Institutional ownership	0.08	0.91	0.05%
Manipulator	0.18***	4.06	0.13%
IPO	0.28***	4.84	0.24%
Litigation risk	0.02	0.04	0.01%
Foreign	0.54***	11.32	0.54%
Short interest	3.40***	14.12	2.14%
Restatement	0.11	0.07	0.08%
AAER	−0.17	0.19	−0.09%
Pre-auditor change	0.29***	4.38	0.26%
N	148,776		
Pseudo-R^2	0.101		
Percentage targeted	0.22%		

Panel A provides descriptive statistics of short seller target firm characteristics with comparison to the full Compustat universe ($N = 16{,}283$). The difference in median p-value is calculated using Mood's median test. See appendix A for variable definitions. Panel B reports a probit regression of the probability of being targeted by an activist short seller in our sample. The dependent variable is an indicator variable equal to 1 if an activist short seller targets the firm-year observation. based on the prior year end realization of the financial variables. See appendix A for variable definitions. The marginal probability column indicates the change in probability of targeting induced by a one-standard-deviation change in the values of the covariate from their respective sample averages.

***, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

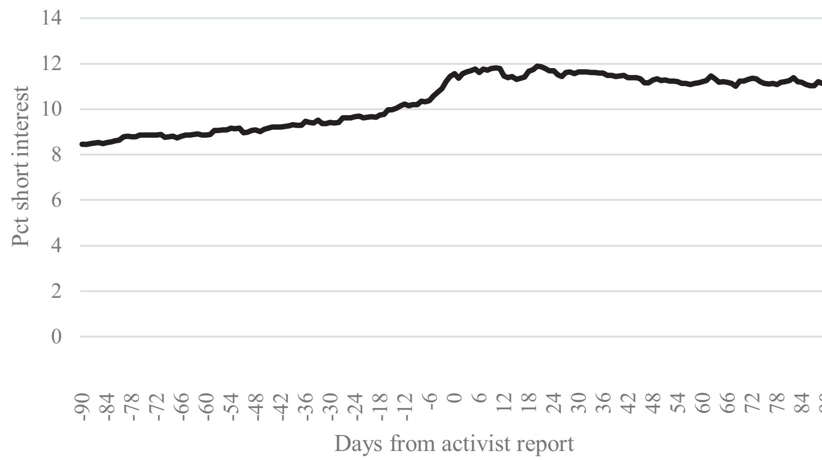

Fig 6.—Average short interest around report releases.

Figure 6 plots the average short interest for targeted firms in the days surrounding report release, and it illustrates that targeted firms have 9% of shares outstanding sold short 90 days prior to the activist report releases, increasing to 12% at the release date. This can be compared to the Compustat population average short interest of 2%. Short interest remains high over the following 90 days, consistent with Appel and Fos [2019].

Figure 7 presents longer term plots of several outcome measures, with comparison plots between targeted firms on the left and matched peers on the right. Peer firms are matched using the nearest neighbors from the probit specification in table 3 and are limited to a caliper of 0.1 standard deviations for the independent variables used in the model.

Panel A of figure 7 shows the average rate of delisting from 36 months prior to 36 months following the report release. We observe 3% of targeted firms delisting in the month immediately of the release, with generally 1–3% per month being delisted over the following 36 months. The matched firms have a delisting rate between 1% and 2% per month, so for targeted firms, delistings appear significantly more pronounced in the months immediately following the report release compared to peer firms.

Panel B of figure 6 illustrates how targeted firms are significantly more likely than peer firms to face enforcement actions with a histogram of AAER violation periods and announcement dates. The plot on the left shows AAER dates for targeted firms, with light-colored bars used to identify the end of the fraud period cited in the AAER. Dark-colored bars represent the histogram of AAER release dates, which all occur after the activist report release. AAER release dates more than 36 months following the event are included in the 36-month bar. AAERs for peer firms are negligible over the same period. The picture that emerges is that short seller reports are issued generally following or during periods of fraud but before SEC

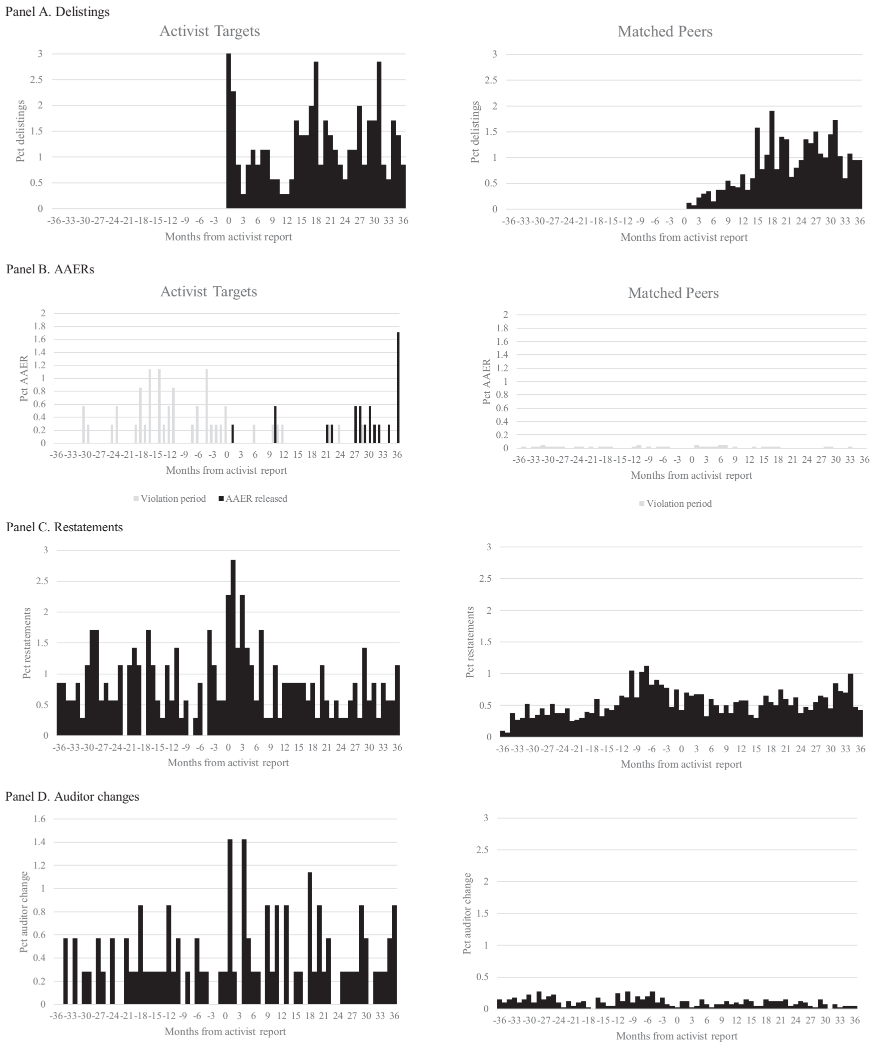

FIG 7.—Monthly descriptive statistics surrounding report dates.

enforcement actions are disclosed. This is not necessarily causal evidence that the SEC identifies fraudulent activity from the short seller reports, the pattern could also be consistent with short sellers and the SEC observing the same warning signs that prompt investigation of the firm, but with the SEC taking longer to complete their investigation and issue an order. We manually examine all the AAERs that follow the activist report and find that 64% specifically address issues raised in the short seller reports, indicating that the enforcement actions have a strong relation to the short sellers' allegations, even though we cannot comment on the specific mechanism involved (Dyck, Morse and Zingales [2010]).

Panel C of figure 3 shows that restatements rates are consistent over the event period, but they are somewhat more frequent in the six months following the short seller event for targeted firms, indicating the activist report may prompt auditors to reevaluate previously issued financial reports (e.g., Bockus and Gigler [1998], Krishnan and Krishnan [1997]). Panel D illustrates a 52% increase in auditor resignations from the pre-release period to the post-release period for targeted firms, with lower rates of auditor resignations in both periods for matched firms. In summary, the monthly time-series patterns indicate a significant association between the report release and the outcomes we examine.

5. *Target Firm Responses and Outcomes*

5.1 REPORT CHARACTERISTICS AND TARGET FIRM RESPONSES

We next examine factors associated with the decision to respond and the type of response in a multivariate setting. Panel A of table 4 presents a summary of probit and OLS regressions of firm response types on indicator variables for the major categories of report allegations and an indicator variable if the abnormal return in the three days surrounding report issuance is in the lowest quartile. We include the full set of control variables used in table 3, panel B, in all regressions. Column 1 presents a probit regression specification, and columns 2–4 present OLS specifications with no fixed effects, year fixed effects only, and year and activist fixed effects, respectively.

Panel A provides evidence that bottom quartile abnormal returns are significantly associated with making any response, with the previous discussion. Firms in the bottom quartile of returns are between 18 and 29 percentage points more likely to respond, compared to the overall average, consistent with the univariate results. Reports containing new evidence are also a predictor of responding, with a 11- to 17-percentage-point increase in the likelihood of responding, significant in all specifications other than the no-fixed-effects OLS specification. It is plausible that when the activist presents data and conclusions using new evidence, management may be better positioned to use the data to verify or refute the allegations more easily than reports based on the opinion of existing data.

Considering specific report characteristics, we find that firms are less likely to respond with lawsuits when reports allege business issues, consistent with these issues presenting opinions that are less actionable in a defamation suit. Internal investigations are strongly associated with first quartile announcement returns, providing evidence that negative returns are associated with reports that present target firms with credible red flags for fraud or other serious wrongdoing.

In panel B of table 4, we present a similar analysis using the most common report bundles as independent variables. We run separate regressions with an indicator for each bundle included in a stepwise fashion and the

TABLE 4

Report Characteristics and Firm Responses

Panel A: Report characteristics and firm responses					
	Probit		OLS		
	Coef. (1)	Marg. Prob. (%)	No Fixed Effects Coef. (2)	Year Fixed Effects Coef. (3)	Year and Activist Fixed Effects Coef. (4)
Dependent Variable: *Any Response*					
Accounting issues	0.21	6.57	0.06	0.07	0.10^{*}
Disclosure issues	0.26	8.39	0.06	−0.00	0.02
Business issues	−0.29	−9.95	−0.08	-0.15^{*}	-0.21^{**}
Management issues	−0.09	−2.94	−0.02	−0.01	−0.00
Securities fraud	0.03	1.03	0.01	0.01	0.01
New evidence	0.35^{**}	11.34	0.10	0.17^{**}	0.15^{**}
First quartile CAR[−1,+1]	0.82^{***}	29.20	0.28^{***}	0.23^{***}	0.18^{***}
Dependent Variable: *Denial*					
Accounting issues	0.17	4.90	0.04	0.06	0.08
Disclosure issues	0.28	8.21	0.06	0.001	0.03
Business issues	−0.12	−4.90	−0.03	−0.08	−0.14
Management issues	−0.21	−6.28	−0.04	−0.04	−0.03
Securities fraud	0.01	0.33	0.01	0.01	0.01
New evidence	0.41^{**}	12.06	0.11	0.17^{***}	0.14^{**}
First quartile CAR[−1,+1]	0.70^{***}	23.56	0.23^{***}	0.18^{***}	0.13^{**}
Dependent Variable: *Lawsuit*					
Accounting issues	0.00	0.00	−0.01	−0.001	0.02
Disclosure issues	0.09	0.24	0.01	−0.02	−0.01
Business issues	-0.86^{***}	−5.60	-0.11^{***}	-0.12^{***}	-0.09^{**}
Management issues	-0.64^{*}	−2.35	−0.03	−0.02	−0.03

(*Continued*)

TABLE 4—*(Continued)*

Panel A: Report characteristics and firm responses					
	Probit		OLS		
	Coef. (1)	Marg. Prob. (%)	No Fixed Effects Coef. (2)	Year Fixed Effects Coef. (3)	Year and Activist Fixed Effects Coef. (4)
Securities fraud	0.54	1.64	0.05	0.03	0.02
New evidence	0.43	1.27	0.03	0.06^{**}	0.07^{***}
First quartile CAR[−1,+1]	0.54^{*}	2.34	0.07	0.04	0.01
Dependent Variable: *Internal Investigation*					
Accounting issues	1.43^{**}	0.25	0.04	0.04	0.06^{**}
Disclosure issues	0.42	0.06	−0.01	−0.01	−0.001
Business issues	−0.46	−0.14	−0.04	−0.04	−0.06
Management issues	−0.47	−0.09	0.01	0.01	0.01
Securities fraud	−0.43	−0.08	−0.02	−0.03	−0.03
New evidence	0.06	0.01	−0.01	−0.01	−0.003
First quartile CAR[−1,+1]	1.55^{***}	1.56	0.10^{**}	0.10^{**}	0.09^{**}
Dependent Variable: *Additional Disclosure*					
Accounting issues	0.20	2.98	0.03	0.03	0.04
Disclosure issues	0.28	4.19	0.03	0.01	0.03

(Continued)

TABLE 4—*(Continued)*

Panel A: Report characteristics and firm responses

	Probit		OLS		
	Coef. (1)	Marg. Prob. (%)	No Fixed Effects Coef. (2)	Year Fixed Effects Coef. (3)	Year and Activist Fixed Effects Coef. (4)
Business issues	−0.34	−6.19	−0.07	-0.09^{*}	-0.12^{**}
Management issues	0.17	2.06	0.04	0.03	0.06
Securities fraud	−0.12	−1.87	−0.02	−0.01	−0.01
New evidence	−0.02	−0.36	−0.00	0.03	0.03
First quartile CAR[−1,+1]	0.31	5.31	0.09^{*}	0.09	0.07

Panel B: Report allegation bundles and firm responses

	Probit Coef. (1)	Marg. Prob %	OLS No Fixed Effects Coef. (2)	OLS Year Fixed Effects Coef. (3)	OLS Year and Activist Fixed Effects Coef. (4)
	Dependent Variable: *Any Response*				
All issues	0.44^{***}	15.63	0.16^{**}	0.14^{*}	0.09
Business issues only	-5.38^{***}	−30.82	-0.33^{***}	-0.31^{***}	-0.30^{***}
All issues except securities fraud	0.04	1.21	0.01	0.01	0.01
Accounting and business issues only	−0.81	−20.10	-0.17^{**}	-0.15^{**}	-0.13^{**}

(*Continued*)

TABLE 4—*(Continued)*

Panel B: Report allegation bundles and firm responses

	Probit Coef. (1)	Marg. Prob %	OLS No Fixed Effects Coef. (2)	Year Fixed Effects Coef. (3)	Year and Activist Fixed Effects Coef. (4)
All issues except new evidence	−0.02	−0.72	−0.01	−0.04	0.08
Business issues and new evidence only	0.45	0.16	0.14	0.14	−0.02
		Dependent Variable: *Denial*			
All issues	0.37**	12.00	0.12*	0.11	0.06
Business issues only	−5.28***	−27.22	−0.30***	−0.26***	−0.25***
All issues except securities fraud	0.12	4.02	0.04	0.02	0.03
Accounting and business issues only	−0.75	−17.38	−0.16**	−0.13*	−0.13*
All issues except new evidence	−0.18	−5.25	−0.05	−0.09	0.00
Business issues and new evidence only	0.55	19.73	0.17	0.20*	0.05
		Dependent Variable: *Lawsuit*			
All issues	0.04	0.20	0.02	0.02	0.02
Business issues only	−4.42	−2.36	−0.05**	−0.04*	−0.06**

(*Continued*)

TABLE 4—*(Continued)*

Panel B: Report allegation bundles and firm responses

	Probit Coef. (1)	Marg. Prob %	OLS No Fixed Effects Coef. (2)	OLS Year Fixed Effects Coef. (3)	OLS Year and Activist Fixed Effects Coef. (4)
All issues except securities fraud	−0.14	−0.63	−0.02	−0.01	0.01
Accounting and business issues only	−4.08	−2.21	-0.05^{**}	-0.05^{**}	-0.04^{**}
All issues except new evidence	−0.13	−0.59	−0.01	−0.05	0.01
Business issues and new evidence only	0.23	1.46	0.02	0.03	0.03
Dependent Variable: *Internal Investigation*					
All issues	0.16	0.43	0.01	0.01	0.00
Business issues only	−5.04	−0.82	−0.03	−0.03	-0.06^{*}
All issues except securities fraud	0.69	2.73	0.03	0.05	0.06
Accounting and business issues only	−3.86	−0.91	−0.03	−0.02	−0.02
All issues except new evidence	−4.41	−0.90	-0.06^{**}	-0.08^{***}	−0.04
Business issues and new evidence only	−3.81	−0.89	-0.02^{*}	-0.03^{*}	-0.07^{***}
Dependent Variable: *Additional Disclosures*					
All issues	0.20	3.44	0.04	0.04	0.03
Business issues only	-4.56^{***}	−10.32	-0.13^{***}	-0.13^{***}	-0.14^{***}
All issues except securities fraud	0.09	1.55	0.00	−0.02	0.00
Accounting and business issues only	−0.24	−3.39	−0.04	−0.05	−0.07
All issues except new evidence	0.66^{*}	15.34	0.17	0.18	0.23
Business issues and new evidence only	0.14	2.46	0.06	0.07	−0.02

Panel A provides the probit and ordinary least square regression coefficients of interest for specification including year and short seller fixed effects with clustered standard errors based on short sellers. Panel B provides the probit and ordinary least square regression specification including year and short seller fixed effects with clustered standard errors based on short sellers. The regressions are conducted in a stepwise manner, with an independent dummy variable included for a single bundle with each regression. The complete list of bundle definitions is provided in panel C of table 1. All regressions include the control variables included in panel B of table 3. See appendix A for variable definitions. $N = 351$.

$^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

TABLE 5

Target Firm Responses and Outcomes

	Probit		OLS		
	Coef. (1)	Marg. Prob (%)	No Fixed Effects Coef. (2)	Year Fixed Effects Coef. (3)	Year and Activist Fixed Effects Coef. (4)
			Dependent Variable: *Delisted*		
No response	0.60	12.72	0.14	0.09	0.08
Denial	0.05	−1.23	0.02	0.01	−0.01
Lawsuit	0.79**	36.78	0.23**	0.12*	0.06
Internal investigation	0.74*	22.18	0.19***	0.19***	0.16***
Additional disclosures	0.52	13.00	0.12*	0.09	0.09
			Dependent variable: *AAER*		
No response	−0.33	−0.35	−0.12	−0.10	−0.14
Denial	−1.07	−0.67	−0.16	−0.11	−0.13
Lawsuit	−5.52	−0.72	−0.07	−0.09	−0.14*
Internal investigation	1.34**	6.69	0.20**	0.20**	0.18**
Additional disclosures	−0.32	−0.20	−0.04	−0.04	−0.04
			Dependent Variable: *Acquired*		
No response	−0.28	−5.36	−0.05	−0.08	−0.10
Denial	0.28	5.31	0.08	0.02	0.02
Lawsuit	−0.65	−7.76	−0.15*	−0.05	−0.04
Internal investigation	−0.97*	−9.38	−0.21**	−0.22***	−0.24***
Additional disclosures	−0.10	−1.63	−0.02	−0.04	−0.03
			Dependent Variable: *Restatements*		
No response	−0.14	−2.84	−0.06	−0.07	−0.07
Denial	−0.46	−7.96	−0.11	−0.10	−0.08
Lawsuit	−0.81	−9.95	−0.11	−0.15*	−0.28**
Internal investigation	0.52	13.03	0.10	0.11	0.08
Additional disclosures	0.05	0.89	0.00	−0.01	−0.02
			Dependent Variable: *Auditor Change*		
No response	−0.38	−0.40	−0.01	0.02	0.02
Denial	−0.40	−0.28	−0.02	0.04	0.06
Lawsuit	−1.12	−0.33	−0.07	−0.10	−0.14
Internal investigation	0.76	1.80	0.11	0.08	0.06
Additional disclosures	−0.25	−0.17	−0.04	−0.04	−0.06

This tables provides the probit and ordinary least square specification including year and short seller fixed effects with clustered standard errors based on short sellers. All regressions include the control variables included in panel B of table 3. See appendix A for variable definitions. $N = 351$.

$^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$.

full set of control variables from table 3, panel B. The reported coefficients on each bundle, therefore, represent the marginal effect of that bundle compared to all other reports. The results of this analysis show that bundles containing all issues are more likely to be associated with some response, whereas reports that only allege business issues are associated with a lower likelihood of making any response, as well as lower chances of denials, lawsuit, and additional disclosure responses.

5.2 TARGET FIRM RESPONSES AND SIGNIFICANT OUTCOMES

In our final analyses, we examine the association between responses and firm outcomes. Table 5 presents a summary of the probit and OLS regression coefficients of significant firm outcomes regressed on indicators for the firm response types and the full set of control variables.

Table 5 provides no statistically significant evidence that nonresponse is associated with any of the outcomes we consider. This is consistent with our prediction that there are plausible reasons not to respond both when the firm agrees and disagrees with the activist allegations. Nonresponses appear to provide little information to investors about the accuracy of the activists' claims, insofar as they are realized through these outcome measures.[9] Lawsuit responses are positively associated with delisting in most specifications, which is not an association we predicted but is consistent with these firms suffering significant damages that they may attempt to recover through litigation.

Internal investigations are associated with a 16- to 22-percentage-point greater likelihood of delisting, a 7- to 20-percentage-point greater rate of receiving an AAER, and a 9- to 24-percentage point lower rate of being acquired, and these results are statistically significant in all specifications, providing evidence that the internal investigation response is associated with firms that have more adverse outcomes following the report release. We examine each firm that launches an internal investigation (untabulated) and find that of the 14 internal investigations in the sample, only three result in a public disclosure that the investigation cleared the firm of wrongdoing, six cases disclosed findings that wrongdoing did occur, and in the remaining five cases, the firm did not release the investigation results and is also delisted, indicating a finding of wrongdoing likely occurred. Considered together, these results are consistent with firms announcing internal investigations when the activist presented a sufficiently credible case to trigger directors' duty to investigate.

6. Conclusion

How firms respond to activist short seller reports is an important question because short activism is an increasingly frequent phenomenon that significantly impacts target firms. Our study provides new evidence about the types of responses firms make in response to short seller reports, and the association of those reports with significant firm outcomes. Although the majority of firms choose not to respond publicly to the activist, 31% of firms respond by denying the activists' claims, threatening or launching lawsuits against the activist, providing additional disclosures, and

[9] In untabulated tests, we examine if these responses are associated with post-report returns, but cannot reject the hypothesis of no effect of response on subsequent returns at standard levels of significance.

launching internal investigations. Firm response choices are associated with report characteristics and its market impact, as firms are significantly more likely to respond when the activist report is accompanied by more negative abnormal returns and when the report contains new information not already available in public disclosures. Conversely, not responding is associated with more muted stock price response to the report release and fewer adverse outcomes. Launching an internal investigation is an important action, as firms electing this option are more likely to be delisted, more likely to receive a fraud enforcement action, and less likely to be acquired. We extend the literature on internal investigations by providing empirical evidence on the decision to conduct internal investigations and the relation of investigations to short seller activity and firm outcomes. Our study highlights the impact that activist short sellers have on target firms and that firms' responses are associated with firm outcomes.

APPENDIX A

VARIABLE DEFINITIONS

See online appendix A for example coding of short seller reports, and online appendix B for example coding of a target firm response.

Accounting Issues	
Revenue	Indicator variable of value 1 if the target company overstates its revenues, and 0 otherwise.
Expense	Indicator variable of value 1 if the target company understates its expenses, and 0 otherwise.
Income	Indicator variable of value 1 if the target company overstates its income (e.g., operating income, net income), and 0 otherwise.
Cash flow	Indicator variable of value 1 if the target company overstates or misclassifies its cash flow, and 0 otherwise.
Assets	Indicator variable of value 1 if the target company overestimates its assets, and 0 otherwise; or if it conducted improper asset recognition, failure to write down the asset or overestimated goodwill.
Liabilities	Indicator variable of value 1 if the target company underestimates its liabilities (e.g., off–balance sheet liabilities), and 0 otherwise.
Non-GAAP	Indicator variable of value 1 if the target company inadequately uses/discloses Non-GAAP measures (e.g., EBITDA, EBIT, adj. EBITDA, adj. EBIT), and 0 otherwise.
Audit and internal controls	Indicator variable of value 1 if the target has a weak auditor, frequent changes of auditors or other internal control issues, and 0 otherwise.

Disclosure Issues	
Incomplete disclosure	Indicator variable of value 1 if the target company makes vague or inadequate disclosures, and 0 otherwise.
Errors in disclosure	Indicator variable of value 1 if the target company makes disclosures that are inconsistent with the law, for example, fraudulent disclosures, missing documents that are demanded by law/regulation, and 0 otherwise.

Business Issues	
Product	Indicator variable of value 1 if the target company has bad/fake products, and 0 otherwise.
Business	Indicator variable of value 1 if the target company has a flawed business model, for example, inherent unprofitability due to a competitive market, related party transactions, missing clients and contracts, production facilities nonexisting, and 0 otherwise.
Acquisitions and divestitures	Indicator variable of value 1 if the target company has made poor or improper acquisitions and divestitures, and 0 otherwise.
Management Issues	
Management	Indicator variable of value 1 if the target company has issues with the management, incl. past fraud participation, frequent changes of top management (CEO, CFO), and 0 otherwise.
Securities fraud	Indicator variable of value 1 if the short seller alleges material lie or omission in connection with the purchase or sale of a security, insider trading. Filings that included false reports (annual report, quarterly reports), and 0 otherwise. Do they use the word "fraud"?
New evidence	Indicator variable of value 1 if the short seller provides new information, not in existing securities filings or produces a sufficiently novel analysis of filings to present strong evidence of the alleged improper activity (e.g., photos, legal documents, new analysis, and interpretations), and 0 otherwise.

Response Variables	
Press release	Indicator variable of value 1 if the target company issues a press release, and 0 otherwise.
Form 8-K	Indicator variable of value 1 if the target company issues 8-K filing, and 0 otherwise.
Conference call	Indicator variable of value 1 if the target company issues a conference call, and 0 otherwise.
Denial	Indicator variable of value 1 if the target company makes a hostile response, incl. insulting the short seller, and 0 otherwise.
Lawsuit	Indicator variable of value 1 if the target company makes or threatens to file a lawsuit, and 0 otherwise.
Internal investigation	Indicator variable of value 1 if the target company announces to conduct internal investigations, for example, setting up a special committee, and 0 otherwise
Additional disclosure	Indicator variable of value 1 if the target company discloses additional information, and 0 otherwise.

Outcome Variables	
AAER	Indicator variable of value 1 if the target company has an increase of Accounting and Auditing Enforcement Releases (AAER) after the *EVENT_DATE*, and 0 otherwise. AAER data set from the USC Leventhal School of Accounting at the Marshall School of Business (Dechow et al. [2011]).
Delisting	Indicator variable of value 1 if the target company is delisted after the *EVENT_DATE*, and 0 otherwise. CRSP.
Acquired	Indicator variable of value 1 if the target company is acquired after the *EVENT_DATE*, and 0 otherwise. CRSP.
CAR[−1,+1]	Is the cumulative abnormal return (CAR) over the window (−1/+1) surrounding the activist short seller report disclosure. cumulative abnormal returns are calculated using the market model: $CAR\,[a, b]_i = \prod_{d=a}^{b}(1 + AR_{id}) - 1$, where$CAR[a, b]_i$ is the cumulative abnormal return for firm i for day a through day b.AR_{id} is calculated as $AR_{id} = r_{id} - [\widehat{\alpha_i} + \widehat{\beta_1} RMRF_d + \widehat{\beta_2} SMB_d + \widehat{\beta_3} HML_d + \widehat{\beta_4} UMD_d]$, where AR_{id} is the abnormal return for firm i on day d,r_{id} is the excess return of the stock i for day d over the one month Treasury Bill rate, $RMRF_d$ is the excess market return for day d using the value-weighted CRSP index of all firms traded on the NYSE, NASDAQ, and Amex exchanges, SMB_d, HML_d, and UMD_d are the portfolio returns on the size, book-to-market, and momentum portfolios on day d, and $\widehat{\alpha_i}$ and the $\hat{\beta}s$ are estimated from the equation:$r_{id} = \alpha_i + \beta_1 RMRF_d + \beta_2 SMB_d + \beta_3 HML_d + \beta_4 UMD_d + \varepsilon_{id}$, using a pre-event period from event day −252 trading days to event day −20 trading days. Observations with less than 70 days of returns data in the estimation period are dropped. CRSP.
CAR[+2,+60]	Is the cumulative abnormal return (CAR) over the window (+2/+60). Firms that are delisted during the post-event window CAR calculate up through the delisting date. CRSP.
CAR[+2,+252]	Is the cumulative abnormal return (CAR) over the window (+2/+252). Firms that are delisted during the post-event window CAR calculate up through the delisting date. CRSP
Severe outcome	Is an indicator if AAER, delisting, or acquired equals 1.
Restatements	Indicator variable of value 1 if the target company had a restatement filed over the subsequent 12 months after the EVENT_DATE, and 0 otherwise. Audit Analytics.
Auditor change	Indicator variable of value 1 if the target company had a change of the auditor filed over the subsequent 12 months after the *EVENT* indicator variable *_DATE*, and 0 otherwise. Audit Analytics.
Abnormal media count	Use count of media mentions and calculate abnormal media pct in days −65 to −20. Factset, all news sources.
Daily short interest	Is the daily percentage of shares outstanding that are shorted. Compustat *short_pre/ csho/*1,000,000

Control Variables	
Log market cap	Is the log of the market value of equity at the beginning of the fiscal year in which the short seller report is published (Compustat, *csho*prcc_f*).
BTM	Is the ratio of the target company's book value of equity to its market value of equity as of the beginning of the fiscal year in which the short seller's report was published. Compustat, Book/MktCap, where Book is defined as *seq-pstk* and MktCap as *csho*prcc_f*.
Leverage	Is the ratio of long-term debt to the sum of debt and market value of equity. Compustat, calculated via as (long-term debt (*dltt*)+debt in current liabilities(*dlc*))/total assets(*at*).
Analysts	Is the log number of equity analysts issuing earnings forecasts for the fiscal quarter in which the short seller's report is published. Compustat and calculated as log(numan + 1).
Institutional ownership	Is the percentage of the target company's stock held by institutional investors as of the beginning of the quarter in which the short seller's report is published. Thomson Insider.
Foreign	Indicator variable of value 1 if the target company is foreign headquartered. Compustat loc is not "USA".
Litigation risk	Kim and Skinner [2012]. Indicator equal to 1 if primary SIC-codes is in the set (2833:2836, 3570:3577, 3600:3647, 5200:5961, 7370:7374, 8731:8734). Compustat
Short interest	Is the percentage of shares outstanding that are shorted prior to the short seller's report publication date. *Compustat short_pre/csho/1,000,000.*
Q	Tobin's *Q*. Compustat *((*Long-term debt *(dltt)*+ debt in current liabilities *(dlc)* + price times shares outstanding *(prc*shrout))/(*Long-term debt *(dltt)* + debt in current liabilities *(dlc)*+ *(*shareholders' equity *(seq)* – preferred stock *(pstk))*.
Dividend yield	The dividend yield. *Compustat (dvp+dvc)/(MktCap+pstk)*.
ROA	Return on assets. *Compustat ibadj/shift(at,1,NA,"lag")?*
Manipulator	Indicator variable equal to 1 if the *M*-score is greater than -1.78, and where the *M*-score is calculated as $-4.84 + 0.920 * dsri + 0.528 * gmi + 0.404 * aqi + 0.892 * sgi + 0.115 * depi - 0.172 * sgai + 4.679 * tata - 0.327 * lvgi$ (see Beneish [1999] for the calculation of the underlying ratios.) Compustat.
IPO	Indicator variable equal to 1 if the report is filed during the first year the company is listed in Compustat.
Earnings announcement	Indicator variable of value 1 if the target company's response is within five days of a quarterly earnings announcement date, and 0 otherwise.
Avg pre-returns	Cumulative abnormal returns in the ($-5/-1$) relative to the event date. CRSP.
Pre-AAER	Indicator variable of value 1 if the target company had a change of the auditor filed over the prior 12 months after the *EVENT_DATE*, and 0 otherwise. AAER data set from the USC Leventhal School of Accounting at the Marshall School of Business (Dechow et al. [2011]) and SEC.
Pre-restatement	Indicator variable of value 1 if the target company had a restatement filed over the subsequent 12 months prior the *EVENT_DATE*, and 0 otherwise. Audit Analytics.
Pre-auditor change	Indicator variable of value 1 if the target company had a change of the auditor filed over the subsequent 12 months prior the *EVENT_DATE*, and 0 otherwise. Audit Analytics.
First quartile of CAR[−1,+1]	Indicator variable of value 1 if the target company is in the lowest *CAR*[−1,+1] quartile, and 0 otherwise. CRSP.

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