

**Is short-selling always a disciplining mechanism?
Evidence from earnings management after being shorted publicly**

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Evidence from earnings management after being shorted publicly

Abstract

Unlike passive short sellers, activist short sellers explain publicly the reasons for shorting a stock through the dissemination of one or a series of negative research reports about a firm. We examine whether target firms subject to activist short sellers' campaigns engage in earnings management in the period following the dissemination of short sellers' theses. Firms exposed by activist short sellers could either attempt to artificially increase earnings to signal strong performance and restore investors' positive views about the company. Alternatively, exposed firms could avoid or reduce earnings management in the face of increased scrutiny from market participants and regulators. Using more than 900 activist short sellers' campaigns from 2010 to 2017, we find that target firms exhibit more positive income-increasing discretionary accruals in the four quarters following the release of activist short sellers' reports relative to non-target firms matched by market value of equity or levels of pre-campaign accruals. The economic magnitude of such quarterly income-increasing earnings management by target firms is approximately 0.8% of lagged total assets. This effect is stronger for campaigns focusing on market-based allegations, for campaigns for which the short seller discloses a large expected price decline, and when the target firm organizes a conference call. We also find that investors see through target firms' attempt to increase reported earnings through abnormal accruals.

Keywords: Activism; Short selling; Earnings management; Difference-in-differences; Gatekeepers; Abnormal accruals

1. Introduction

Due to reputation and compensation concerns, or fear of losing control of their firms through hostile takeovers, managers generally care about the stock price of their company (Knopf et al. 2002; Fee and Hadlock 2003; Servaes and Tamayo 2014). Short sellers put pressure on publicly listed firms by decreasing a firm's stock price (Grullon et al. 2015; Li and Zhang 2015). Historically, short selling has been mostly passive, that is, shorting the stock of a firm while being silent on the rationale for doing so (i.e., passive short sellers do not explain their "short thesis") (Wong and Zhao 2017). A more recent form of short selling has emerged mostly during and after the 2008-09 financial crisis: activist short sellers that publicly engage in campaigns to openly criticize public firms (Chen 2016; Ljungqvist and Qian 2016). Unlike passive short sellers that maintain a short position without attracting attention from other market participants,¹ activist short sellers explain their reasons for shorting a stock to a large audience by disseminating their short theses on their own websites, on Twitter, on popular finance forums (e.g., Seeking Alpha) (Zhao 2019), or on business news channels (e.g., Citron Research or Muddy Waters Research appear regularly on CNBC). In these reports, activist short sellers explain to other market participants why target firms are overvalued due to various issues such as corporate fraud, excessive use of leverage, flawed business models, competitive pressure, or regulatory issues.

The major difference between passive and active short selling relates to the signal it sends to market participants. Relative to passive short selling, active short selling is primarily based on revealing new and critically negative information about target firms for at least three reasons (Wong and Zhao 2017; Zhao 2017). First, activist short selling is information-driven because it is a bet on the decline of stock prices, whereas passive short selling may be motivated by tax or hedging purposes (Brent et al. 1990). Second, because activist short sellers talk down stocks publicly, it is considerably riskier than passive short-selling due to potential retaliatory actions from firms or scrutiny from market regulators (e.g., investigation for market manipulation). Therefore, activist short sellers must believe that the negative information they reveal publicly is critical enough to face these risks. Third, activist short selling attempt to make long investors

¹ Greater attention from other investors could increase the costs of short selling. For a stock that is hard to short, a short seller would like the stock price to go down but not necessarily that other people short the stock (Lamont 2012). Holding costs of a short position rise when other investors are simultaneously trying to short a stock. If more people decide to short a stock, the cost of shorting a stock rises and existing stock loans may be called back by the stock lender. In addition, increased attention can lead to legal actions and harassment from the target company.

sell their stocks based on the information they reveal and, therefore, the release of information is less constrained by the supply of stocks in the equity-loan market (Ljungqvist and Qian 2016).

Passive and activist short selling also differ in their relation to accruals. Several studies suggest that passive short sellers target high-accrual firms and seek to arbitrage the accrual anomaly by short selling stocks of firms before a decrease in accruals (Desai et al. 2006; Karpoff and Lou 2010; Hirshleifer et al. 2011). In contrast, Zhao (2017) stresses that activist short sellers do not target firms on accruals. In fact, passive short sellers attempt to arbitrage the accrual anomaly without attracting attention from other investors. Disclosing publicly the decision to short a stock would increase the cost of short selling for passive short seller without increasing *a priori* the expected gains of the trade. Overall, activist short sellers' criteria to target a firm are different from those of passive short sellers (see Appendix 1 for a list of allegations). On average, empirical evidence shows that the stock price of target firms drops significantly surrounding the disclosure of activist short sellers' reports (Chen 2016; Ljungqvist and Qian 2016; Appel et al. 2019) and that activist short sellers target opaque firms (Zhao 2019).

In this paper, we examine how target firms react to such accusations that lead to a significant decrease in their stock price. Most investors assess firm performance and investment opportunities using financial statements and in particular fixate on reported earnings to form a view about past and future performance (Hand 1990; Elliott et al. 2011; Lansford et al. 2013). Therefore, we examine the effect of activist short sellers' campaigns on earnings management by target firms following activist short sellers' campaigns.

Considering the pressure faced by firms exposed by activist short sellers, managers may face strong incentives to show good results and attempt to report higher than expected earnings in order to contradict activist short sellers' negative theses and restore their stock price (or to prevent a further decline). According to this argument, we can expect income-increasing earnings management in the period following the dissemination of activist short sellers' theses. We note that the use of earnings management could either reflect earnings manipulation or attempt to signal managers' positive private information about future performance through income-increasing accruals (Bartov et al. 2002; Gunny and Zhang 2014).

Conversely, past research shows that passive short selling (or short-selling threats) reduces earnings management (Massa et al. 2015; Fang et al. 2016). Activist short selling could actually deter earnings management as does passive short selling. Managers exposed by activist short sellers could significantly reduce or avoid engaging in earnings management considering the greater attention from market participants to their financial statements. Poor earnings quality might also be counter-productive and attract more short sellers who target these firms (Desai et

al. 2006; Karpoff and Lou 2010; Hirshleifer et al. 2011). This would reduce the incentives to manipulate earnings as a defense strategy. Finally, regulators may scrutinize carefully financial statements of firms targeted by activist short sellers, thus increasing the likelihood of detection and costs of income-increasing earnings management. As a result, following these alternative arguments, we can expect no change or even a decrease in income-increasing earnings management following the dissemination of the activist short sellers' theses.

To summarize, the effect of activist short selling on earnings management is an open empirical question. Therefore, we examine the change of earnings management for firms targeted by activist short sellers following the initiation of short sellers' campaigns relative to control firms not targeted by activist short sellers using a difference-in-differences empirical setting.

We examine 936 activist short sellers' campaigns from 2010 to 2017 and examine the change of earnings management in the four quarters following the release of the first activist short seller's report relative to the period prior to the attack. We compare firms targeted by activist short sellers with non-target firms matched based on industry and market value of equity or level of discretionary accruals in the quarter preceding the attack.² We find that target firms exhibit more positive signed discretionary accruals in the four quarters following the attack relative to matched control firms. The economic magnitude is economically large: the increase in signed discretionary accruals for target firms in the four quarters following the attack is at least 0.8% of lagged total assets relative to control firms.³

In cross-sectional tests, we find that the increase in signed discretionary accruals is greater for primarily market-based activist short sellers' allegations (i.e., allegations involving a bubble, stock promotion or other overvaluation) and if the downside target (i.e., the expected stock price decrease) disclosed by the short seller in the report is substantial. Earnings management is also more important if the target firm organizes a conference call to respond short sellers' allegations. This indicates that earnings management is complementary with other communication strategies to address activist short sellers' allegations.

Finally, using investors' reaction to earnings announcements, we find that investors are not deceived by target firms' attempt to increase artificially reported earnings. We find no investor reaction to income-increasing accruals from target firms around earnings announcement date

² In an additional analysis, we obtain control firms matched by level of short interest at the beginning of the campaign. We find qualitatively similar results (see section 6.5 below).

³ We use total accruals and six different specifications to estimate abnormal accruals. The economic magnitude of the effect ranges between 0.8% and 1.9% of lagged total assets.

using three-day cumulative abnormal returns (CARs). Eventually, we find more negative CARs over the trading month subsequent to earnings announcement for firms with more income-increasing accruals.

This paper makes several contributions to the literature. First, we show that the effect of activist short selling on earnings management is different from the relation between passive short selling and earnings management examined in past research (Massa et al. 2015; Fang et al. 2016). Our findings actually indicate that the greater incentives to engage in income-increasing earnings management to restore investors' trust in the performance of the firm dominates, on average, potential costs from increased market and regulatory scrutiny. This result is novel in the literature and suggests that short selling is not necessarily a disciplining mechanism. Second, we identify a new source of earnings management, which complements the vast research on this topic (e.g., Jones 1991; Dechow et al. 1995; Dechow et al. 1996; Beatty et al. 2002; Lo et al. 2017). Third, we document the implication for financial reporting of a recent phenomenon, i.e., activist short sellers that has gained considerable momentum after the 2008-09 financial crisis (Black 2018). Activist short sellers are an emerging type of gatekeeper which is relevant considering the pervasiveness of frauds in financial markets (e.g., International Organization of Securities Commissions (IOSCO) 2005). Fraud is a problem challenging to address for traditional gatekeepers such as market regulators, financial analysts, and auditors who have different incentives and often limited resources (Roychowdhury and Srinivasan 2019).

The remainder of the paper is organized as follows. We review related studies and develop our hypothesis in section 2, present our data in section 3 and show our main results in section 4, complemented by additional analyses in section 5. We conclude in section 6.

2. Related studies and hypothesis

Passive short selling

Past studies have examined several aspects of passive short selling or short-selling threats⁴ (for a general review and a methodology review, see Reed 2013, 2015). Li and Zhang (2015), using Regulation SHO in the US that relaxed certain short-selling constraints for a set of stocks

⁴ The easiness and costs of shorting a stock, which are both correlated with short-selling threats, should be distinguished from investors' actual short-selling activity (i.e., passive and active short selling).

randomly selected,⁵ document that short-selling threats have a causal effect on corporate disclosures about bad news. Short sellers are generally considered sophisticated investors that are able to detect and profit from stock mispricing. Karpoff and Lou (2010) investigate a set of firms that, ex post, were clearly overpriced: those that are disciplined by the SEC for financial misrepresentation. They find that short sellers are proficient at identifying financial misrepresentation before it becomes public.

The literature already shows that managers respond to passive short selling. Managers react to increase in short-selling threats by reducing the precision of bad news forecasts and the readiness of bad news annual reports. Bhattacharya et al. (2016) find that the threat of increased short-selling significantly curbs aggressive non-GAAP disclosures. Passive short selling is also related to price discovery (Boehmer and Wu 2013), investing and financing activities (Grullon et al. 2015), and executive contracting outcomes (Chang et al. 2015).

Lamont (2012) finds that passive short selling allows stocks to trade closer to their fundamental value. He examines whether overpricing increases when firms make it more difficult to short their shares for instance when they file lawsuits against short sellers, hire private investigators, restrict stock lending from shareholders, engage in stock splits, or demand investigations against short sellers from market regulators. He finds that firms exhibit significantly lower returns in the year subsequent to actions aiming at constraining short selling (about -2% per month).

Bargeron and Bonaime (Forthcoming) examine whether managers buy back stocks with increasing short interest. Two reasons could explain why managers have a tendency to repurchase stock following increase in short interest: managerial short termism associated with myopia or, alternatively, private information about the firm indicating that it is significantly undervalued. The study corroborates the second explanation by finding positive abnormal return following the increase in short interest. Evidence indicates that managers are unlikely to use repurchases to artificially inflate stock prices but rather do so based on their private positive information.

Desai et al. (2006) examine whether short sellers target firms with poor earnings quality as proxied by earnings restatements. They find that short sellers accumulate positions in restating

⁵ On September 7, 2004, the SEC passed Regulation SHO, which suspended temporarily short-sale price tests for a set of randomly selected pilot stocks from May 2, 2005 to August 6, 2007. Pilot stocks comprised every third stock composing the Russell 3000 Index ranked by average daily trading volume (Li and Zhang 2015). The suspension of short-sale price tests (i.e., the uptick test for stocks trading on the NYSE and the bid test for stocks trading on the NASDAQ) led to an exogenous decrease in short-sale constraints, leading to an increase in short-selling activities for randomly selected pilot stocks.

firms several months in advance of the restatement and subsequently unwind these positions after the drop in share price induced by the restatement. They also find that increase in short interest is larger for firms with high levels of accruals prior to restatement. This is consistent with short sellers being sophisticated investors able to see through earnings management.

Christophe et al. (2004) examine short-sales transactions in the five days prior to earnings announcements. They provide evidence of informed trading in pre-announcement short selling because they reveal that abnormal selling relates to post-announcement stock returns. Christophe et al. (2010) study short selling prior to the release of analyst downgrades. They find abnormal levels of short selling in the three days before downgrades are publicly announced.

Importantly, past literature on passive short selling has also been interested in its relation with earnings management, whether the latter represents a factor that attracts short sellers or whether short selling impacts earnings management. Park (2017) examines whether short sellers exploit the overvaluation of firms employing real earnings management. She finds that firms with more real earnings management exhibit higher subsequent short interest.

Fang et al. (2016), using a natural experiment based on Regulation SHO in the US (see above), show that passive short selling reduces earnings management. Massa et al. (2015) hypothesize that short selling has a disciplining role vis-à-vis firm managers that forces them to reduce earnings management. They document a significantly negative relationship between the threat of short selling and earnings management. Their findings suggest that short selling functions as an external governance mechanism to discipline managers. Short sellers can then be considered as “market protectors” (Lee 2013). Li and Xia (2019) show that stock liquidity helps to deter earnings management via facilitating passive short selling which discipline managers.

Hirshleifer et al. (2011) study short selling and the accrual anomaly. Using a long period (1988–2009), they examine arbitrage of the accrual anomaly in a general sample rather than a post-selected sample of exceptional firms that had earnings restatements. They find short arbitrage of the accrual anomaly. In both univariate and multivariate tests, there is a significant positive relationship between accruals and short interest.

Activist short selling

A recent line of research focuses on activist short sellers. Past literature has examined the stock market impact surrounding the publication of activist short sellers’ research reports to assess their information content (Ljungqvist and Qian 2016). This study shows the effect on

stock prices, SEC filings, bid-ask spreads, volume of stocks exchanged and selloff by existing shareholders. The findings corroborate the argument that activist short sellers convince long investors to sell their stocks by revealing negative information about exposed firms. Appel et al. (2019) document abnormal returns for targets of approximately -7% around the release date of activist short sellers' reports. They also show that firm stakeholders, including the media, plaintiffs' attorneys, and other short sellers, play an important role in activist short sellers' campaigns.

Wong and Zhao (2017) examine the effect of activist short campaigns on a number of real outcomes, i.e., investing, financing and payout activities of target firms. They document significant negative impact on target firms facing activist short sellers' campaigns ranging between -7.2% and -24.5%, with the largest absolute impact being on target firms' ability to raise money (i.e., financing activities).

Chen (2016) provides evidence among US-listed Chinese firms that activist short sellers target firms that exhibit some financial reporting warnings. Zhao (2019) investigates whether activist short sellers are more likely to target opaque firms and whether they reveal information to other market participants or, conversely, spread misleading information to profit from short terms gains, a claim often made by target firms. Using a large sample of public short campaigns, he finds that activist short sellers are more likely to target opaque firms and that they reveal relevant information to other market participants rather than spread false information about exposed firms. Kartapanis (2019) focuses on accounting fraud allegations. He finds that activist short sellers provide the strongest signal that a firm has committed fraud relative to other common fraud predictors such as short interest, F-score or abnormal audit fees. However, only 30% of fraud allegations are subsequently confirmed. Unconfirmed fraud allegations generate costs for target firms and capital markets.

Conversely, Mitts (2019) depicts a less positive role played by a category of activist short sellers. He focuses on activist short sellers that produce anonymous attacks by individuals that often change their pseudonyms on finance forums and disseminate negative research reports on companies. This tactic known as "short and distort" exploits the perception that an individual is a trustworthy activist short sellers, although she spreads rumors and profits from short-term gains. Similarly, Hu (2018) studies opportunistic campaign behavior and proposes a framework to detect such behavior. The paper identifies clustered campaigns (i.e., multiple campaigns published through various sources on the same target and same date) as one opportunistic campaign strategy.

We complement the literature on activist short selling and passive short selling by examining whether target firms' use earnings management to defend their firm.

Hypothesis

We focus on earnings management by firms targeted by activist short sellers. Managers are likely to using various communication strategies to try to defend their firm and their actions after the disclosure of activist short sellers' reports. Financial statements are an important source of information for market participants (Beyer et al. 2010). One line of reasoning suggests that target firms may attempt to contradict the negative information revealed by activist short sellers by reporting strong performance in the period immediately following the attack. Considering the importance of reported earnings for investors (Hand 1990; Elliott et al. 2011; Lansford et al. 2013), managers may engage in income-increasing earnings management to show strong performance to market participants in order to attempt to recover from the negative reaction on the stock market.

Black (2018) provides anecdotal evidence that managers use corporate disclosures to defend their firm against activist short sellers. Target firms sometimes employ investor relations firms. Black (2018) reports an interview with an investor relations firm. The interviewee explains "throughout a defense against a short seller, we are looking for a continuous drumbeat of positive news to articulate the strength of the business." Earnings can be used as part of this disclosure strategy as the interviewee adds: "Pre-announcing favorable quarterly earnings and/or guidance could be particularly beneficial depending on how investors and shorts traditionally trade in and out of a stock around earnings." Therefore, strong earnings can facilitate managers' claim that their firm's core performance is robust and that the stock is not, in fact, overvalued. Managers could attempt to truly signal positive private information by artificially increasing earnings (Louis and Robinson 2005). This line of reasoning suggests that income-increasing discretionary accruals are higher following the attack of activist short sellers for target firms than for control firms.

Conversely, it is plausible that facing increased pressure from market participants, managers avoid or reduce their level of earnings management for several reasons. First, the financial statements of firms targeted by activist short sellers face increased scrutiny from market participants and regulators. This increased scrutiny may raise the likelihood of detection of earnings management. The strategy could backfire if investors see through earnings management. Second, past studies indicate that passive short sellers target firms with low earnings quality (Desai et al. 2006; Karpoff and Lou 2010; Hirshleifer et al. 2011). By

increasing earnings management following activist short sellers' attack, managers may actually attract more short sellers further contributing to a declining stock price. These alternate arguments suggest that income-increasing discretionary accruals could be no different or actually lower following the attack of activist short sellers for target firms relative to control firms.

Considering the competing arguments presented above, we state our main hypothesis in the null form.

H1: There is no change in earnings management for firms targeted by activist short sellers subsequent to the release of the short thesis relative to control firms.

3. Empirical strategy

Data and sample selection

The sample of short-selling campaigns is obtained from the “Short” section of the database Activist Insight (previously Activist Short Research). Because there are only few campaigns before 2010, we restrict the sample to the 2010-2017 period. We obtain a total of 1,328 campaigns with a precise allegation date and different additional information about the campaigns (see Table 1, Panel A). One campaign can include several reports published by an activist short seller about a firm.⁶

We obtain relevant financial statements and market variables using Compustat and CRSP between 2007 and 2018. We merge the target firms of Activist Insight with the CRSP/Compustat universe using their ticker symbol. We check manually the corresponding company names subsequently to a fuzzy name matching because the ticker symbols do not uniquely identify firms over time and exchanges. We present the sample selection in Table 1, Panel A. We are able to merge Compustat (CRSP) with 1,051 (1,075) campaigns of our initial dataset of 1,328 Activist Insight campaigns. We lose some campaigns because some target firms of the Activist Insight database are not listed in the US. Then, we also remove firms in the financial services (SIC 6000–6999) and utilities (SIC 4900–4949) because the way the accruals are generated substantially differs from other industries. We also require that the target firms are covered by Compustat during the quarter of allegation. In the end, we obtain 936

⁶ An activist short seller may release several reports during one campaign but may also target one firm during several campaigns if an older campaign is considered ended by Activist Insight. Activist Insight considers that a campaign has ended either because the activist recognizes it or because the activist short seller has not released any report for one year. For instance, Tesla was targeted by Citron Research both in 2013 and 2016.

campaigns that match all our criteria (see Table 1, Panel A). Finally, we use Compustat supplemental short file to obtain data on short interest.

Insert Table 1 About Here

The distribution of campaigns is relatively balanced across years and industries as presented in Table 1, Panels B and C. There are only few campaigns before 2013. Activist Insight provides 18 different types of allegations. In order to use these data in subsequent analyses, we group these allegations into four wider categories: frauds, financial-based allegations, economic-based allegations and market-based allegations. We present in Appendix 1 the classification of these four categories. Financial-based allegations include all the criticisms relative to the financial fundamentals of the firm (e.g., excessive use of leverage). Economic-based allegations correspond to potential weaknesses due an allegedly low competitiveness (e.g., new entrants in the industry) or an operating problem (e.g., low quality products, expired patents). Market-based allegations are relative to financial markets and overvaluation (e.g., financial market bubble). The campaigns are well distributed across these four main allegations as summarized in Table 1, Panel D.

Measures of earnings management

We define total accruals as income before extraordinary items minus operating cash flows. To ensure the robustness of our findings, we use several measures to capture earnings management. First, we use total accruals which are primarily used to examine the persistence of earnings (Dechow et al. 2010). Total accruals are also highly associated with abnormal accruals (Dechow et al. 2003) and they can provide information about the extent of earnings management, if any.

Second, we use four common quarterly models of abnormal accruals: the Jones and modified Jones models with and without the linear inclusion of ROA, sales growth and lagged market-to-book variables as presented in Collins et al. (2017). These proxies are quite common in the literature (Jones 1991; Dechow et al. 1995; Kothari et al. 2005).

Third, Collins et al. (2017) argue that accruals exhibit a nonlinear relation with ROA, sales growth and the market-to-book ratio. To improve the precision of abnormal accruals, they suggest adding dummy variables based on the quartiles of the distribution of ROA, sales growth and market-to-book ratio to control for these nonlinear relations. Their specification presents the advantage of controlling for the nonlinearity between quantiles but does not control for the linear differences within quantiles. Because activist short sellers are likely to target high growth

firms (see descriptive statistics presented in Table 2, below), it is critical to effectively consider the effect of growth on abnormal accruals. In the same spirit, to address these linear and nonlinear relations, we multiply each quintile dummies by the value of the corresponding variable. We label these models the piecewise linear Jones and Modified Jones models. Finally, as we use total accruals, we also include net property, plant and equipment in each model. All relevant variables are scaled by lagged total assets. Details on the computations of each model are available in Appendix 2.

Research design and descriptive statistics

The nature of our data gives us the opportunity to use a staggered difference-in-differences setting because target firms receive the treatment (i.e., the short seller allegation) at different points in time. We consider three periods: *Pre* which corresponds to quarters that are prior to the first campaign quarter, *Campaign* which covers the four quarters subsequent to the allegation, and *Post* which includes all quarters after the Campaign period. We include the quarter of the activist short seller allegation as part of the *Pre* period. Indeed, it is unclear how quickly the target firms can react after the allegation. Besides, financial information and the level of accruals could actually be anticipated by the short sellers and therefore explain the timing of the allegation. Reverse causality could complicate our analysis if we included the quarter of allegation in the *Campaign* period. Thus, we chose not to include the allegation quarter in the *Campaign* period. Nevertheless, we also create a fourth period: *Alleg Quarter* for the allegation quarter for some analyses. A timeline of the successive periods and events is provided in Figure 1.

Insert Figure 1 About Here

We consider that a campaign lasts four quarters. It is consistent with what happens in practice, on average. Moreover, even though the actual duration of a campaign can be longer or shorter than four quarters, it is actually a conservative test of our main hypothesis. Indeed, our purpose is to reject the null hypothesis that states no effect on earnings management. An imprecise definition of the campaign periods only reduces our ability to obtain a significant coefficient and, as a consequence, to reject the null hypothesis.

In order to use a difference-in-differences design, it is necessary to define a control group. We match each target firm with the non-target firm with the closest market capitalization in the same industry at the beginning of the allegation quarter. In an alternative matching, we match each target firm with a non-target firm in the same industry with the closest level of (abnormal

or total) accruals.⁷ The numbers of matched campaigns by procedure are available in Panel A of Table 2.

Our baseline OLS regression model is:

$$\begin{aligned} \text{Accruals} = & \beta_0 + \beta_1 \text{Treat} \times \text{Campaign} + \beta_2 \text{Treat} \times \text{Post} + \beta_3 \text{Campaign} \\ & + \beta_4 \text{Post} + \text{Controls} + \text{Fixed effects} + \varepsilon \end{aligned} \quad (1)$$

The main coefficient of interest in model (1) is β_1 which captures the effect of being the target of an activist short seller campaign on earnings management relative to matched control firms in the following four quarters. We include the following control variables: firm size (*Size*), leverage (*Leverage*), level of investments in CapEx and R&D (*Investment*) and level of inventory (*Inventory*). For total accruals or abnormal accruals that are not determined using ROA (*ROA*), sales growth (*SG*) or lagged market-to-book ratio (*MtB* (t-1)), we also include these three control variables. All variables are defined in Appendix 2. We add firm fixed effects for all models but we only add calendar quarter fixed effects for total accruals and for abnormal accruals that are determined within a year-industry sample (models with piecewise linear *ROA*, *SG* and *MtB*). We do not include quarter fixed effects when abnormal accruals are computed within quarter-industry groups because they already include potential quarter-industry effects (nonetheless, our results are similar if we include quarter fixed effects). Moreover, we cluster standard errors at the firm and calendar quarter levels.

Table 2, Panel B presents the descriptive statistics of our treatment and control samples one quarter before the allegation of the activist short seller. The control sample is obtained by matching each target firm with its closest non-target firm in terms of market capitalization in the same industry. Using an unpaired t-test, we find systematic differences between target and non-target firms in all the variables except for market capitalization, total accruals and leverage. The absence of difference of total accruals between target and control firms confirms the idea that activist short sellers are not interested in arbitraging the accrual anomaly. Interestingly, target firms exhibit significantly higher market-to-book ratio of equity one quarter prior to the allegation quarter than control firms (6.19 vs. 3.19 for target and control firms, respectively, difference significant at less than 1%). This is consistent with overvaluation of target firms. It also suggests that activist short sellers target growth firms and not value firms. Thus, controlling carefully for growth to compute abnormal accruals is important. Variable imbalances between

⁷ To be sure that the matching is efficient, we require the difference in level of (abnormal or total) accruals between the treatment and control firms to be less than 25% of lagged total assets.

treated and control firms indicate a non-random treatment. This clearly indicates that activist short sellers target firms with specific characteristics. However, variable imbalances do not necessarily weaken our difference-in-differences methodology if we find evidence that the parallel trends assumption is verified. Graphically, we find limited differences in abnormal accruals time series between treated and control firms (see Figure 2 in the Results section). Besides, we also provide evidence in the additional results that our results hold even though we match target firms on the level of abnormal accruals or short selling activity (i.e., short interest ratio).

Insert Table 2 About Here

Descriptive statistics of the daily abnormal return relative to allegation date are available in Table 3, Panel A. During the day of the allegation, the mean abnormal return is equal to -3.89% (t-stat = -11.31). The median abnormal return is negative as well (-2.4%). The mean abnormal return of the next trading day is also negative (-0.85%) and significantly different from zero (t-stat = -3.41). These statistics suggest that the activist short sellers' theses have a strong impact on the stock price. This is consistent with prior findings (Ljungqvist and Qian 2016; Appel et al. 2019). Then, we present in Table 3, Panel B, daily mean abnormal returns relative to the allegation day, conditionally on the type of allegation: fraud, financial, economic and market based allegations. The abnormal return is the lowest when the allegation involves a fraud (-7.31%, t-stat = -7.49). On the contrary, all the other allegations exhibit similar abnormal daily return slightly lower than -3%.

Insert Table 3 About Here

Additional analyses based on campaign characteristics

In a second part of the analysis, we modify our baseline regression model to investigate the potential moderating effects of the association between *Campaign* and earnings management. Examining these moderators allows to strengthen the causal inference of the previous results by identifying some situations in which the relation is likely to be stronger.

Table 4, Panel A presents different variables regarding the downside target of the stock price and a potential conference call organized to respond short sellers' allegations. The

downside target (*Target_Pct*) indicates the expected decrease of the stock price in percentage⁸. The binary variable *High_Target* takes the value one if the downside target is higher than the 75th percentile. As a target is not necessarily provided in the reports, we also define the binary variable *Missing_Target* to indicate whether a target is indicated in the report. Finally, we define the binary variable *Conf_Call* that takes the value one if a conference call is organized to respond short seller's allegations.

When available, the mean downside target is approximately 66% (i.e., activist short sellers, on average, estimate a decrease of 66% of the target stock price). Moreover, for 3.3% of campaigns the firm organizes a conference call after a short seller's allegations. Interestingly, an investor relations firm interviewed in Black (2018) explains that "while every situation is unique, an immediate conference call may feel good at the time but is generally not the right first-day response. Sometimes, the call makes the situation worse (see Pershing Square and Valeant responding to short attacks)."

Table 4, Panel B presents the correlations between the previous variables and the nature of the allegations. One can note the strong positive association between a fraud allegation and the downside target (correlation = 0.22, significant at less than 1%) or the likelihood to organize a conference call (correlation = 0.21, significant at less than 1%). The higher downside target suggests that fraud allegations are more serious. On the contrary, financial-based allegations are associated with smaller downside target (correlation = -0.11, significant at less than 5%).

Insert Table 4 About Here

4. Results

5.1 Main results

In the baseline regression, the main coefficient of interest in model (1) is β_1 , which captures the effect of *Treat* during *Campaign* on earnings management (i.e., the average change in abnormal accruals for target firms during the campaign relative to control firms). We are also interested in coefficient β_2 of model (1), the interaction between *Treat* and *Post* to test whether the effect on earnings management lasts more than the four quarters after the allegation.

⁸ We follow Activist Insight to code this variable. If a range of targets is disclosed, the midpoint is used. If there are multiple targets associated with different dates, we use the higher downside target absolute value. If there is a change of downside target in a subsequent report, we use the first downside target.

Table 5, Panel A, indicates the results of the baseline regression if the control sample is based on non-target firms matched by market capitalization (Panel B then presents the results using control matched on accruals). For all the models, the coefficients of the main interaction (i.e., $Treat \times Campaign$) are positive and statistically significant at less than 10% for the linear Jones and modified Jones and for the piecewise linear Jones and Modified Jones, at less than 5% for the Modified Jones and total accruals, and at less than 1% for the Jones model. The average effect of *Campaign* on abnormal accruals for target firms ranges between +0.8% and +1.9% of lagged total assets. The smaller coefficients for the last models are consistent with the smaller type I error documented by Collins et al. (2017) when controlling for performance and growth. Therefore, the most plausible coefficient should be around 0.8 to 0.9%. It indicates that a target firm increases its abnormal accruals by approximately 0.8% of its lagged total assets each quarter during the campaign. The coefficients of $Treat \times Post$ are also positive and significant if we do not control for performance growth in the abnormal accrual models. It strengthens the idea that the two last categories of models are more appropriate as the effect should only be concentrated within a relatively short period.

Insert Table 5 About Here

Figure 2 shows the levels of abnormal accruals over time for treated and control firms relative to the allegation quarter. In Figure 2, control firms are obtained by matching treatment firms with their closest peer in terms of market capitalization in the same industry-quarter group. It provides a visual approach to our results and facilitates the verification of the parallel trends assumption necessary for the difference-in-differences setting.

Insert Figure 2 about Here

Figure 2 shows the increase in abnormal accruals for target firms relative to control firms is clearly visually present in the data for the six measures of abnormal accruals. For all the models, there is an increase of abnormal accruals after the allegation quarter for the firms that are targeted by a short seller. Using a difference-in-differences design necessitates a parallel trend assumption.⁹ Figure 2 also shows visually that the parallel trends assumption is reasonably

⁹ In order to use a difference-in-differences design for the main analysis, some assumptions need to be fulfilled. In particular, the SUTVA (stable unit treatment value assumption) requires that the treatment status of one firm does not affect the outcome of any other firm. This assumption could be violated if we consider, for instance, that a non-treated firm modifies its financial reporting because a peer was previously targeted by a short seller. The fact that the coefficients of *Campaign* are not significant in Table 5, Panel A mitigates this concern.

supported by our data for the first Jones and modified Jones models. For the other models, the difference, especially right before the allegation quarter, is low.

From Figure 2, one could observe a slight decrease of the abnormal accruals for treatment firms few quarters before the allegation. This decrease in abnormal accruals is consistent with higher short selling threats because previous studies document that passive short selling tends to reduce earnings management (Massa et al. 2015; Fang et al. 2016).

One potential concern with findings reported in Table 5, Panel A is that our findings could be explained by a reversal of accruals as the treatment firms exhibit (statistically insignificant) lower total accruals. Indeed, low accruals are associated with subsequent higher accruals. Therefore, the effect we document could be the consequence of the initial lower level of accruals and not the allegation. This issue is addressed by using a second control group presented in Table 5, Panel B. In this Panel, we match our treatment firms with firms that exhibit similar level of (abnormal) accruals one quarter before the allegation. This allows to ensure that the results are not driven by a reversal in accruals. Panel B shows that, except for the modified Jones model, the estimated coefficients β_1 on *Treat* \times *Campaign* are significant and positive. The coefficients β_1 range between +0.9% and +1.7%, which is similar than reported β_1 coefficients in Table 5, Panel A.

5.2 Earnings management and type of short seller allegations

The extent of earnings management could be arguably influenced by the type of allegation of the activist short sellers. Indeed, claiming that a firm committed fraud is likely to be a more severe signal than arguing that a target firm has a low pricing power in its industry. Especially, market scrutiny is likely to be higher in these cases. If an activist short seller alleges that a firm is committing accounting fraud, then managing earnings might actually be a poor choice for managers. Therefore, we estimate our baseline model (1) on the four subsamples corresponding to each type of allegation: fraud, financial-based allegation, economic-based allegation and market-based allegation. The last category of allegations is relatively unspecific as it consists mostly of overvaluations. The control sample is determined using the market capitalization and the abnormal accruals are computed with a performance modified Jones model with piecewise linear *ROA*, *SG* and *MB*. Table 6 presents the results.

Insert Table 6 About Here

There is no effect if the allegation concerns a fraud, a financial concern or an economic concern. It suggests that more specific activist short seller allegations do not lead to an increase

of abnormal accruals. Indeed, the three concerns for which we are unable to reject the null hypothesis are more specific and tackle a problem of the target firms such as a fraud, a high leverage or a low competitiveness. On the contrary, in case of market-based allegation, the target firm engages more strongly in earnings management with an estimated coefficient β_1 on $Treat \times Campaign$ of +1.7% (the coefficient is significant at less than 10%). Overall, this evidence suggests a positive association between the allegation and the earnings management only if the allegation is unspecific. Moreover, it makes sense that the firms that are targeted because of their overvaluation tries to defend it by improving artificially their profitability. It is the best way of addressing directly the allegation of the short seller. Doing so for the other allegations may not address the problem depicted in the activist's report.

5. Additional analyses

6.1 The role of the downside target on earnings management

Activist Insight database also provides information about the downside target included in the activists' reports. Our purpose is to investigate if the increase in abnormal accruals is moderated by the level of this target. When available, a downside target is a good proxy for the severity of the allegation as it indicates the future price expected by the short seller. Contrary to the abnormal return around the release of the report, this proxy assesses the severity of the allegation and not the reaction of the market. In particular, abnormal returns could be influenced by over or under-reaction, especially if a new information, potentially manipulative, is disclosed by the activist short seller. A high downside target could have opposite effects on earnings management.

On the one hand, it could increase market scrutiny by highlighting the issues of the firm. Thus, a high target could increase market participant attention and limit the set of possible reactions of the target firm. On the other hand, a report with a high downside target is more likely to be taken into account and considered as relevant by the target firm. Indeed, if the price target is too close to the current price, the target firm might consider that the allegations are not important. We estimate model (1) adding relevant interaction variables using the continuous variable $Target_Pct$ and the binary variable $High_Target$. We are now interested in the coefficients $Treat \times Campaign \times Target_Pct$ and $Treat \times Campaign \times High_Target$. The baseline regression (1) is also estimated on two subsamples, whether the downside target is high or not. The results are presented in Table 7. The coefficients $Treat \times Campaign \times Target_Pct$ and $Treat \times Campaign \times High_Target$ are both positive and significant. Besides,

in the two subsamples, the coefficient $Treat \times Campaign$ is only significant in the sample with a high downside target. If the target is high, the increase of abnormal accruals is equal to 2.6-2.9% of lagged total assets while it is only 0.4% if the downside target is low. These results suggest that a target firm only reacts to a short seller allegation by managing its earnings if the allegation is severe or if the short seller is aggressive in its report. Weak allegations tend to be disregarded by the target firm.

Insert Table 7 About Here

6.2 The role of a different channel reaction: The case of a conference call

A target may react to short sellers' allegations using different tactics such as a conference call, the resignation of the CEO or the distribution of dividends. In this section, we focus on the strategic use of conference calls. Contrary to other tactics, the conference call allows the firm to react and to contradict short sellers' allegations. Therefore, earnings management and conference call could be considered as opposite channel reactions. Similar to the downside target, the effect of the conference call on the subsequent earnings management is not straightforward.

Organizing such an event would mean that the report sent by the activist is severe and credible. Moreover, the conference call would also suggest that the firm is ready to react to the allegations and would therefore be more likely to use other channel reactions. Nevertheless, all the different reactions could also be substitutable. To this regard, the firm could choose either to organize a conference call or to manage earnings. We add relevant interaction variables to the baseline model (1). We are interested in the coefficients of $Treat \times Campaign \times Conf_Call$ and $Treat \times Campaign$ when the regression is performed within the two subsamples. The coefficient $Treat \times Campaign \times Conf_Call$ is positive and statistically significant. The coefficients of $Treat \times Campaign$ in the two subsamples are also positive and significant but the coefficient is much higher when a conference call is organized. These results suggest that a firm is more likely to manage its earnings if it organized a conference call previously. As a result, the two reactions are complementary and not substitutes. When a firm considers that an allegation is credible, managers address it through different channels.

Insert Table 8 About Here

6.3 Stock returns surrounding earnings announcements by target firms

A natural question that arises is whether target firms engaging in earnings management following activist short sellers' allegation are able to influence investors. We examine investors' reaction surrounding earnings announcements by target firms. We restrict the sample to target firms and investigate the cumulative abnormal return around earnings release date provided by Compustat. We provide a timeline for this test in Figure 3 to present when we measure abnormal accruals and when we measure investors' reaction.

Insert Figure 3 About Here

To examine investors' reaction to abnormal accruals reported by target firms during the campaign period we estimate the following OLS model in the sample of target firms:

$$CAR(-I, k) = \beta_0 + \beta_1 Accruals \times Campaign + \beta_2 Accruals \times Post + \beta_3 Post + \beta_4 Campaign + \text{Fixed Effects} + \varepsilon \quad (2)$$

The main coefficient of interest is β_1 that capture investors' reaction to abnormal accruals during the campaign period. Estimation results are presented in Table 9. If managers can influence investors through earnings management, β_1 should be positive. On the contrary, if investors are able to see through this abnormal increase to infer negative information about the firm, the coefficient should be negative. Table 9 indicates that abnormal accruals are not associated with subsequent abnormal return during the campaign if we consider a cumulative abnormal return with a short window, i.e., $CAR(-I, 1)$. It indicates that investors are not able to unravel the increase of abnormal accruals on the short run but are not positively influenced by abnormal positive performance either. Nevertheless, if we consider a longer window to compute the cumulative abnormal return, i.e., $CAR(-I, 21)$ which is equivalent to one trading month, the coefficient of *Abnormal accruals* \times *Campaign* is negative and statistically significant. The negative impact of the abnormal accruals on the $CAR(-I, 21)$ during the campaign is -0.127 (= -0.097 - 0.03) whereas it is only -0.03 before the campaign. Therefore, the negative effect of the abnormal accruals on the $CAR(-I, 21)$ is approximately four times larger during the campaign period than before the campaign period (4.2 = 0.127 / 0.03). These results suggest that the increase of abnormal accruals is not useful because the market prices this reaction. Investors react more negatively to earnings for which signed abnormal accruals are larger.

Insert Table 9 About Here

6.4. Short interest

We obtain short interest data using Compustat Supplemental Short Interest File. We define the short interest ratio as the raw short interest divided by the number of common shares outstanding. Then, we define the variable *SI* as the average of all observations of the short interest ratio for a firm during a fiscal quarter while *SI Max* considers the highest value for this quarter. To test the effect of activist short sellers on short interest, we examine the following OLS model:

$$SI = \beta_0 + \beta_1 Treat \times Alleg Quarter + \beta_2 Treat \times Campaign + \beta_3 Treat \times Post + \beta_4 Alleg Quarter + \beta_5 Campaign + \beta_5 Post + Controls + Fixed Effects + \varepsilon \quad (3)$$

We use a difference-in-differences design including four time variables: pre-allegation period, allegation quarter (*Alleg Quarter*), campaign quarters (*Campaign*) and post-allegation period (*Post*). We include three control variables: market capitalization to control for size, book-to-market ratio and momentum, defined as the relative price change of the last quarter, to control for short arbitrage of anomalies. The control sample is determined using the market capitalization one quarter before the allegation. We require a two-way clustering and add firm and quarter fixed effects.

In Table 10, we examine the effect on short interest of activist short seller allegations.

Insert Table 10 About Here

First, we document the increase of short interest induced by short sellers' trading strategies and allegations (see positive coefficient β_1 for *Treat* \times *Alleg Quarter* across all specifications, significant at less than 1%). Table 10 documents a strong increase of short interest during the quarter of allegation and then the four following quarters (see positive coefficient β_2 for *Treat* \times *Campaign* across all specifications, significant at less than 1%) for target firms compared to control firms. The coefficient is still significant but lower for the quarters following the campaign. It suggests that short seller activity is concentrated into the four quarters after the allegation. Thus, this seems to be a reasonable assumption for the duration of the campaign.

6.5. Matching on short interest

One potential concern with the previous results is reverse causality. Short sellers target firms based on abnormal accruals. It means that the allegation could be explained by the subsequent earnings management. We address this concern in two ways. First, reverse causality should not be an issue because short sellers target firms with future *decrease* in accruals to arbitrage the accrual anomaly. Because we document an *increase* in abnormal accruals following an allegation, the intuition of the reverse causality goes against our results and would mean that our coefficient of 0.8% is actually conservative. Second, in order to address statistically the fact that activist short sellers may target firms with increasing accruals, we perform the baseline regression with a new control sample. We match the target firms with their counterpart with the closest level of short interest ratio. The results are presented in Table 11. The coefficients $Treat \times Campaign$ are still significant for six out of seven models. For the significant specifications, the values of the coefficients are between 0.7 and 0.9%. Overall, the results suggest that the results are not due to the ability of short sellers to select specific firms.

Insert Table 11 About Here

6. Discussion and conclusion

We examine whether firms engage in earnings management following activist short sellers' allegations. We find that on average target firms exhibit income-increasing abnormal accruals in the four quarters subsequent to the activist short sellers' allegations. The economic magnitude of this effect is large: approximately 0.8% of lagged total assets. This finding is robust across various earnings management proxies and matching criteria to identify control firms. We find that firms engage in earnings management for unspecific and severe allegations. They do so primarily for market-based allegations. Cross-sectional tests indicate that a high downside target is positively associated with earnings management. Moreover, target firms that respond through a conference call are more likely to manipulate earnings suggesting a complementarity of the different channel reactions. Additional tests show that engaging in earnings management reduces the abnormal return around earnings announcement.

Our study complements past studies examining the effect of passive short selling on earnings management (Massa et al. 2015; Fang et al. 2016). Our findings show that on average firms engage in income-increasing earnings management following activist short selling

whereas past studies have shown that passive short selling reduce earnings management. This result is novel in the literature. Second our study contributes to the earnings management literature (e.g., Jones 1991; Dechow et al. 1995; Dechow et al. 1996; Beatty et al. 2002; Lo et al. 2017). Third, the 2019 public allegations of Harry Markopolos against General Electric illustrates the considerable momentum gained by this emerging type of gatekeeper.¹⁰ Markopolos, famous for blowing the whistle on the Madoff Ponzi scheme for years, worked with an undisclosed hedge fund that shorted GE stock prior to his release of a report. Our study allows to better understand the implications of this new type of market participants.

¹⁰ <https://www.ft.com/content/20c2e468-bf57-11e9-89e2-41e555e96722>

Appendix 1 – Types of allegations

Main allegation	Allegation types (Activist Insight)
Fraud	Accounting fraud Major business fraud Other illegal Pyramid scheme
Financial	Dividend cut coming Over-levered Upcoming earnings miss Misleading accounting
Economic	Competitive pressures Industry issues Ineffective roll-up Medical effectiveness Patent expiration Patent invalid Product ineffective
Market	Bubble Other overvaluation Stock promotion

We group the 18 primary allegations disclosed by Activist Insight into four main types of allegations.

Appendix 2 – Variable definitions

Variable name	Definition
<i>Abnormal Accruals_{i,t}</i> (Jones)	<p>The discretionary accruals are computed using the residuals of different models of normal accruals. They are estimated at the quarter-industry level. The industry is determined thanks to the 48 Fama-French industry classification. We require at least 15 observations per quarter-industry group.</p> $TA_{i,t} = \beta_0 + \beta_1 Q_{1,i,t} + \beta_2 Q_{2,i,t} + \beta_3 Q_{3,i,t} + \beta_4 Q_{4,i,t} + \beta_5 \Delta SAL_{i,t} + \beta_6 PPEN_{i,t} + \varepsilon_{i,t}$ <p>Total accruals $TA_{i,t}$ are defined as earnings before extraordinary items (IBQ) minus operating cash flows (using OANCFY). The variables Q_j are fiscal quarter dummies (FQTR). $\Delta SAL_{i,t}$ is the change in sales (SALEQ). $PPEN_{i,t}$ is net property, plant, and equipment (PPENTQ). All variables are scaled by lagged total assets (ATQ).</p>
<i>Abnormal Accruals_{i,t}</i> (Modified Jones)	<p>The model is estimated as previously.</p> $TA_{i,t} = \beta_0 + \beta_1 Q_{1,i,t} + \beta_2 Q_{2,i,t} + \beta_3 Q_{3,i,t} + \beta_4 Q_{4,i,t} + \beta_5 (\Delta SAL_{i,t} - \Delta REC_{i,t}) + \beta_6 PPEN_{i,t} + \varepsilon_{i,t}$ <p>$\Delta REC_{i,t}$ is the change in accounts receivable (RECTQ) from the preceding quarter.</p>
<i>Abnormal Accruals_{i,t}</i> (Jones with linear <i>ROA</i> , <i>SG</i> and <i>MtB</i>)	<p>The model is estimated as previously.</p> $TA_{i,t} = \beta_0 + \beta_1 Q_{1,i,t} + \beta_2 Q_{2,i,t} + \beta_3 Q_{3,i,t} + \beta_4 Q_{4,i,t} + \beta_5 \Delta SAL_{i,t} + \beta_6 PPEN_{i,t} + \beta_7 ROA_{i,t} + \beta_8 SG_{i,t} + \beta_9 MtB_{i,t-1} + \varepsilon_{i,t}$ <p>$ROA_{i,t}$ is net income (NIQ) divided by lagged total assets (ATQ). $SG_{i,t}$ is defined as $\frac{SALES_{i,t} - SALES_{i,t-4}}{SALES_{i,t-4}}$ using SALEQ. $MtB_{i,t-1}$ is the lagged market-to-book ratio. Market-to-book ratio is computed as the market value of equity (CSHOQ×PRCCQ) divided by the book value of equity (CEQ).</p>
<i>Abnormal Accruals_{i,t}</i> (Modified Jones with linear <i>ROA</i> , <i>SG</i> and <i>MtB</i>)	<p>The model is estimated as previously.</p> $TA_{i,t} = \beta_0 + \beta_1 Q_{1,i,t} + \beta_2 Q_{2,i,t} + \beta_3 Q_{3,i,t} + \beta_4 Q_{4,i,t} + \beta_5 (\Delta SAL_{i,t} - \Delta REC_{i,t}) + \beta_6 PPEN_{i,t} + \beta_7 ROA_{i,t} + \beta_8 SG_{i,t} + \beta_9 MtB_{i,t-1} + \varepsilon_{i,t}$
<i>Abnormal Accruals_{i,t}</i> (Jones with piecewise linear <i>ROA</i> , <i>SG</i> and <i>MtB</i>)	<p>Because of the higher number of variables, the model is estimated within one industry and calendar year. We require at least 30 observations per year-industry group.</p> $TA_{i,t} = \beta_0 + \beta_1 Q_{1,i,t} + \beta_2 Q_{2,i,t} + \beta_3 Q_{3,i,t} + \beta_4 Q_{4,i,t} + \beta_5 \Delta SAL_{i,t} + \beta_6 PPEN_{i,t} + \sum_{k=1}^5 \beta_{7,k} ROA_Dum_{k,i,t} \times ROA_{i,t} + \sum_{k=1}^5 \beta_{8,k} SG_Dum_{k,i,t} \times SG_{i,t} + \sum_{k=1}^5 \beta_{9,k} MtB_Dum_{k,i,t} \times MtB_{i,t-1} + \varepsilon_{i,t}$ <p>The variable $ROA_Dum_{k,i,t}$ takes the value 1 if $ROA_{i,t}$ belongs to the kth quintile in the aggregate data. $SG_Dum_{k,i,t}$ and $MtB_Dum_{k,i,t}$ are defined similarly.</p>

<i>Abnormal Accruals_{i,t}</i> (Modified Jones with piecewise linear <i>ROA</i> , <i>SG</i> and <i>MtB</i>)	The model is also estimated within one industry and calendar year with at least 30 observations. $TA_{i,t} = \beta_0 + \beta_1 Q_{1,i,t} + \beta_2 Q_{2,i,t} + \beta_3 Q_{3,i,t} + \beta_4 Q_{4,i,t} + \beta_5 (\Delta SAL_{i,t} - \Delta REC_{i,t}) + \beta_6 PPEN_{i,t} + \sum_{k=1}^5 \beta_{7,k} ROA_Dum_{k,i,t} \times ROA_{i,t} + \sum_{k=1}^5 \beta_{8,k} SG_Dum_{k,i,t} \times SG_{i,t} + \sum_{k=1}^5 \beta_{9,k} MtB_Dum_{k,i,t} \times MtB_{i,t-1} + \varepsilon_{i,t}$
<i>Treat_i</i>	Dummy variable that equals one if the firm is targeted by an activist short seller. The process to determine the control sample changes across regressions.
<i>Pre_{i,t}</i>	Dummy variable that equals one if the quarter is before the allegation quarter. For the quarter of the allegation, the variable is also equal to one.
<i>Campaign_{i,t}</i>	Dummy variable that equals one if the quarter is one to four quarters after the allegation quarter.
<i>Post_{i,t}</i>	Dummy variable that equals one if the quarter is at least five quarters after the allegation quarter.
<i>Alleg Quarter_{i,t}</i>	Dummy variable that equals one if the quarter is exactly the allegation quarter. This variable is only used with short interest regressions.
<i>Size_{i,t}</i>	Size is the logarithm of total assets (ATQ) at the end of the quarter
<i>Leverage_{i,t}</i>	Leverage is calculated as long-term debt (DLTTQ) plus debt in current liabilities (DLCQ) scaled by the sum of long-term debt, debt in current liabilities and total shareholders' equity (SEQQ).
<i>Market Capitalization_{i,t}</i>	Natural logarithm of the market value of equity (CSHOQ×PRCCQ).
<i>ROA_{i,t}</i>	Return on assets, calculated as income before depreciation and amortization (OIBDPQ) scaled by total assets at the beginning of the quarter.
<i>SG_{i,t}</i>	<i>SG_{i,t}</i> is the backward-looking sales growth over the last four quarters. It is defined as $\frac{SALES_{i,t} - SALES_{i,t-4}}{SALES_{i,t-4}}$ using SALEQ
<i>MtB_{i,t}</i>	Market-to-book ratio is computed as the market value of equity (CSHOQ×PRCCQ) divided by the book value of equity (CEQ). We also define Book-to-market ratio as $BtM_{i,t} = \frac{1}{MtB_{i,t}}$.
<i>Investment_{i,t}</i>	The sum of research and development expenditures (XRDQ) scaled by total assets at the beginning of the quarter and the capital expenditures (using CAPXY) scaled by total assets at the beginning of the quarter. Research and development expenditures are set to zero if missing.
<i>Inventory_{i,t}</i>	Inventory is calculated as the total inventories (INVTQ) scaled by total assets at the beginning of the quarter.
<i>Target_i</i>	Target indicates the expected decrease in percentage of the stock price in the short seller's report.
<i>High_target_i</i>	Dummy variable that equals one if the downside target is above the 75 th percentile.

$Missing_target_i$	Dummy variable that equals one if the short seller does not provide any downside target.
$Conf_call_i$	Dummy variable that equals one if the target firm organize a conference call in response of short sellers' allegations.
$CAR_{i,t}(-1, +k)$ (Cumulative Abnormal Return)	The abnormal daily return is computed using a market adjusted excess return model : $AR_{i,d} = Ret_{i,d} - Ret_{m,d}$ where $Ret_{i,d}$ is the return for firm i at day d while $Ret_{m,d}$ is the return on the S&P 500 index. The cumulative abnormal return is computed as $CAR_i(-1, k) = \sum_{d=-1}^k AR_{i,d}$
$SI_{i,t}$	The variable SI is defined as the average value of the variable SHORTINT over the relevant Compustat quarter. The number of observations within the quarter t for firm i is equal to $n_{i,t}$. $SI_{i,t} = \frac{1}{n_{i,t}} \sum_{n=1}^{n_{i,t}} SI_{i,n}$
$SIMax_{i,t}$	The variable SI Max is defined as the maximum value of the variable SHORTINT over the relevant Compustat quarter. The number of observations within the quarter t for firm i is equal to $n_{i,t}$. $SI\ Max_{i,t} = \max(SI_{i,1}, \dots, SI_{i,n_{i,t}})$
$Momentum_{i,t}$	Momentum is defined as the relative price variation during the previous quarter. $Momentum_{i,t} = \frac{price_{close,t-1} - price_{open,t-1}}{price_{open,t-1}}$

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Table 1 – Sample description of activist short seller campaigns

Panel A - Sample selection

	Number of campaigns
Campaigns between 2010 and 2017	1,328
Campaigns with GVKEY	1,051
Campaigns with PERMCO/PERMNO	1,075
Campaigns with GVKEY after industry restrictions	982
Campaigns with available information at allegation quarter	936

Panel B - Distribution of campaigns by year

	Number of campaigns
2010	26
2011	65
2012	68
2013	111
2014	146
2015	195
2016	192
2017	133
Total	936

Panel C - Distribution of campaigns by industry (first digit SIC)

	Number of campaigns
0 - Agriculture, Forestry and Fishing	2
1 - Mining and Construction	49
2 - Manufacturing	245
3 - Manufacturing	250
4 - Transportation & Public Utilities	36
5 - Wholesale Trade and Retail Trade	96
7 - Services	217
8 - Services	39
9 - Public Administration and Nonclassifiable	2
Total	936

Panel D - Distribution of campaigns by type of allegation

	Number of campaigns
<i>Fraud</i>	170
<i>Financial</i>	156
<i>Economic</i>	348
<i>Market</i>	262
Total	936

Table 1 presents the description of our sample of activist short seller campaigns.

Table 2 – Matching and descriptive statistics

Panel A – Matching target firms

	Number of campaigns matched
Market capitalization	924
Total accruals	851
Accruals based on Jones model	827
Accruals based on modified Jones model	746
Accruals based on Jones model with linear <i>ROA</i> , <i>SG</i> and <i>MtB</i>	728
Accruals based on modified Jones model with linear <i>ROA</i> , <i>SG</i> and <i>MtB</i>	749
Accruals based on Jones model with piecewise linear <i>ROA</i> , <i>SG</i> and <i>MtB</i>	731
Accruals based on modified Jones model with piecewise linear <i>ROA</i> , <i>SG</i> and <i>MtB</i>	856
Short interest ratio	893

Panel B - Descriptive statistics

	Treatment			Control			Difference t
	N	Mean	SD	N	Mean	SD	
<i>Market capitalization</i>	924	6.72	1.88	924	6.71	1.87	0.15
<i>Total accruals</i>	866	-0.09	0.46	887	-0.06	0.40	1.47
<i>ROA</i>	914	-0.14	0.70	911	-0.08	0.61	1.92*
<i>SG</i>	820	0.56	1.48	848	0.30	1.19	4.04***
<i>MtB</i>	923	6.19	21.80	921	3.19	16.68	3.31***
<i>Size</i>	924	5.76	2.29	923	6.31	2.27	5.17***
<i>Leverage</i>	894	0.27	0.60	885	0.31	0.61	1.33
<i>Investment</i>	856	0.05	0.08	880	0.04	0.06	4.09***
<i>Inventory</i>	903	0.08	0.12	895	0.10	0.13	3.02***
<i>SI</i>	884	0.09	0.08	823	0.04	0.05	13.87***
<i>SI Max</i>	884	0.10	0.08	823	0.05	0.05	14.97***

Descriptive statistics are measured one quarter before the allegation

Control sample: market capitalization one quarter before the allegation

Unpaired t-test: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$ (two sided)

All variables are winsorized at 1 and 99%

Table 3 – Returns around the allegation date

Panel A – Daily abnormal return relatively to allegation date

Day	Mean (%)	Median (%)	t
-3	-0.12	-0.39	-0.50
-2	0.07	-0.38	0.32
-1	0.67	-0.57	0.80
0	-3.89	-2.40	-11.31
+1	-0.85	-0.35	-3.41
+2	-0.14	-0.14	-0.73
+3	-0.15	-0.14	-0.89

Mean and median abnormal returns in percent

Panel B – Daily abnormal return relatively to allegation date by type of allegation

Day	Fraud	Financial	Economic	Market
-3	-1.23 (-3.82)	-1.10 (-3.02)	0.39 (0.81)	0.51 (1.10)
-2	-0.89 (-1.76)	-0.58 (-1.42)	0.10 (0.34)	1.09 (1.78)
-1	-2.64 (-5.42)	0.09 (0.08)	1.22 (0.82)	2.48 (1.14)
0	-7.31 (-7.49)	-3.09 (-4.16)	-3.23 (-7.43)	-3.05 (-4.01)
+1	-0.64 (-1.05)	-0.30 (-0.42)	-1.05 (-3.51)	-1.03 (-1.87)
+2	0.70 (1.39)	-0.97 (-1.52)	-0.25 (-1.03)	-0.02 (-0.06)
+3	-0.12 (-0.28)	-0.06 (-0.20)	0.07 (0.32)	-0.55 (-1.27)

Mean abnormal returns in percent
t statistics in parentheses

Table 4 – Descriptive statistics on downside target and conference call

Panel A – Descriptive statistics

	Obs.	Mean (%)	Median (%)	Min. (%)	Max. (%)
<i>Target_Pct</i>	488	65.88	63.8	15.1	100
<i>Missing_Target</i>	936	47.86	0	0	100
<i>Conf_Call</i>	936	3.31	0	0	100

Panel B – Correlation table

	<i>Target_Pct</i>	<i>High_target</i>	<i>Missing_target</i>	<i>Conf_call</i>
<i>Target_Pct</i>	1.00			
<i>High_target</i>	0.71***	1.00		
<i>Missing_target</i>	0.00	0.00	1.00	
<i>Conf_call</i>	0.11**	0.08*	-0.02	1.00
<i>Fraud allegation</i>	0.22***	0.18***	0.06*	0.21***
<i>Financial allegation</i>	-0.10**	-0.09**	0.02	-0.05
<i>Economic allegation</i>	-0.06	-0.04	-0.10***	-0.07**
<i>Market allegation</i>	-0.03	-0.02	0.04	-0.06*

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Table 4 presents descriptive statistics of the downside target that may be included in the report and whether the target firm organizes a conference call to answer short sellers' allegations.

Table 5 – Earnings management following an activist short seller allegation

Panel A – Difference-in-differences relative to control firms matched by pre-campaign market value of equity

$$Accruals = \beta_0 + \beta_1 Treat \times Campaign + \beta_2 Treat \times Post + \beta_3 Campaign + \beta_4 Post + Controls + Fixed\ effects + \varepsilon$$

	Total accruals	Jones	Modified Jones	Linear		Piecewise linear	
				Jones	Modified Jones	Jones	Modified Jones
<i>Treat × Campaign</i>	0.013** (2.49)	0.019** (3.01)	0.016** (2.31)	0.008* (1.83)	0.008* (1.88)	0.009* (1.80)	0.009* (1.78)
<i>Treat × Post</i>	0.010* (1.92)	0.016** (2.46)	0.014* (2.01)	0.006 (1.19)	0.006 (1.39)	0.006 (1.21)	0.007 (1.29)
<i>Campaign</i>	-0.003 (-1.11)	0.003 (0.95)	0.003 (0.77)	-0.000 (-0.23)	-0.001 (-0.35)	-0.001 (-0.27)	-0.001 (-0.23)
<i>Post</i>	-0.000 (-0.09)	0.010*** (2.74)	0.011*** (2.98)	0.000 (0.14)	0.000 (0.02)	0.001 (0.44)	0.000 (0.16)
<i>Size</i>	-0.017*** (-3.11)	-0.038*** (-5.00)	-0.040*** (-5.02)	-0.006 (-1.15)	-0.007 (-1.27)	-0.009 (-1.55)	-0.009 (-1.57)
<i>Leverage</i>	-0.000 (-0.01)	0.002 (0.44)	0.002 (0.43)	-0.001 (-0.41)	-0.001 (-0.69)	-0.001 (-0.36)	-0.001 (-0.50)
<i>Investment</i>	0.076 (0.71)	0.077 (0.61)	0.056 (0.45)	-0.019 (-0.20)	-0.020 (-0.22)	-0.010 (-0.11)	-0.008 (-0.09)
<i>Inventory</i>	0.137*** (3.15)	0.091 (1.54)	0.120* (2.00)	0.091*** (3.44)	0.103*** (3.89)	0.114*** (3.53)	0.126*** (3.87)
<i>ROA</i>	0.730*** (39.92)	0.567*** (17.10)	0.569*** (16.44)				
<i>SG</i>	-0.004** (-2.17)	-0.003* (-1.72)	-0.001 (-0.33)				
<i>MtB (t-1)</i>	-0.000 (-1.68)	-0.000** (-2.28)	-0.000** (-2.19)				
<i>Constant</i>	0.088** (2.26)	0.240*** (4.78)	0.252*** (4.77)	0.028 (0.80)	0.031 (0.90)	0.043 (1.10)	0.045 (1.12)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	No	No	No	No	Yes	Yes
Firm clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	54,952	54,486	53,577	54,406	53,489	54,742	53,835
R2	0.85	0.63	0.63	0.11	0.11	0.09	0.10

Control sample: market capitalization one quarter before the allegation

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Panel B – Difference-in-differences relative to control firms matched by level of pre-campaign accruals

$$Accruals = \beta_0 + \beta_1 Treat \times Campaign + \beta_2 Treat \times Post + \beta_3 Campaign + \beta_4 Post + Controls + Fixed\ effects + \varepsilon$$

	Total accruals	Jones	Modified Jones	Linear		Piecewise linear	
				Jones	Modified Jones	Jones	Modified Jones
<i>Treat × Campaign</i>	0.013*** (2.79)	0.017** (2.06)	0.009 (1.04)	0.010** (2.35)	0.011** (2.61)	0.011** (2.33)	0.012** (2.49)
<i>Treat × Post</i>	0.009 (1.65)	0.013 (1.66)	0.013 (1.40)	0.006 (1.41)	0.004 (0.92)	0.009* (1.87)	0.009* (1.81)
<i>Campaign</i>	-0.004 (-1.42)	0.008 (1.20)	0.012* (1.90)	-0.001 (-0.28)	-0.002 (-0.72)	-0.002 (-0.46)	-0.004 (-1.10)
<i>Post</i>	-0.000 (-0.11)	0.014** (2.27)	0.014* (1.85)	0.001 (0.44)	0.003 (1.43)	-0.001 (-0.27)	-0.004 (-1.03)
<i>Size</i>	-0.016*** (-3.22)	-0.038*** (-5.33)	-0.042*** (-4.98)	-0.006 (-1.11)	-0.007 (-1.37)	-0.010* (-1.78)	-0.009 (-1.52)
<i>Leverage</i>	0.003 (1.14)	0.010* (2.00)	0.007 (1.08)	0.001 (0.23)	-0.003 (-1.06)	-0.003 (-1.24)	-0.003 (-1.10)
<i>Investment</i>	0.133 (1.38)	0.192 (1.20)	0.133 (0.88)	0.124 (1.11)	-0.007 (-0.08)	0.086 (1.03)	0.043 (0.51)
<i>Inventory</i>	0.123*** (3.03)	0.185*** (2.80)	0.115** (2.05)	0.079*** (3.35)	0.112*** (4.96)	0.104*** (3.46)	0.111*** (3.64)
<i>ROA</i>	0.726*** (34.74)	0.539*** (14.15)	0.547*** (13.66)				
<i>SG</i>	-0.002 (-1.31)	-0.004** (-2.16)	-0.002 (-0.72)				
<i>MtB (t-1)</i>	-0.000* (-1.70)	-0.000* (-1.69)	-0.000** (-2.14)				
<i>Constant</i>	0.075** (2.26)	0.220*** (4.95)	0.246*** (4.74)	0.019 (0.59)	0.031 (0.95)	0.045 (1.25)	0.039 (1.06)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	No	No	No	No	Yes	Yes
Firm clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	51,762	51,053	49,246	50,845	49,073	50,219	49,266
R2	0.84	0.57	0.59	0.11	0.11	0.10	0.10

Control sample: (abnormal) accruals one quarter before the allegation
t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Table 6 – Earnings management by allegation

$$Accruals = \beta_0 + \beta_1 Treat \times Campaign + \beta_2 Treat \times Post + \beta_3 Campaign + \beta_4 Post + Controls + Fixed\ effects + \varepsilon$$

	Fraud	Financial	Economic	Market
<i>Treat × Campaign</i>	0.007 (0.92)	0.002 (0.49)	0.007 (1.46)	0.017* (1.69)
<i>Treat × Post</i>	0.002 (0.22)	-0.001 (-0.27)	0.004 (0.66)	0.018 (1.62)
<i>Campaign</i>	0.000 (0.08)	-0.001 (-0.17)	0.002 (0.63)	-0.004 (-0.70)
<i>Post</i>	0.006 (1.07)	0.005 (0.93)	0.002 (0.41)	-0.006 (-1.03)
<i>Size</i>	-0.009** (-2.08)	-0.007 (-1.61)	-0.005 (-1.01)	-0.015 (-1.23)
<i>Leverage</i>	0.009 (1.28)	-0.001 (-0.23)	0.001 (0.17)	-0.007 (-1.45)
<i>Investment</i>	-0.226** (-2.10)	-0.267 (-1.40)	0.144 (1.39)	-0.053 (-0.35)
<i>Inventory</i>	0.219*** (4.28)	0.162*** (5.84)	0.103** (2.16)	0.099* (1.78)
<i>Constant</i>	0.027 (0.96)	0.033 (1.04)	0.018 (0.48)	0.087 (1.08)
Firm FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Firm clustered SE	Yes	Yes	Yes	Yes
Quarter clustered SE	Yes	Yes	Yes	Yes
Observations	8,742	9,325	20,585	15,181
R2	0.14	0.11	0.09	0.10

Control sample: market capitalization one quarter before the allegation

Abnormal accruals are measured with a modified Jones model with piecewise linear *ROA*, *SG* and *MtB*

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Table 7 – Impact of the downside target on earnings management

$$Accruals = \beta_0 + \beta_1 Treat \times Campaign + \beta_2 Treat \times Post + \beta_3 Treat \times Campaign \times Target + \beta_4 Treat \times Post \times Target + Controls + Fixed\ effects + \varepsilon$$

	Full sample	Full sample	High downside target	Low downside target
<i>Treat × Campaign</i>	-0.014 (-1.60)	0.004 (0.53)	0.026** (2.24)	0.004 (0.56)
<i>Treat × Post</i>	-0.007 (-0.68)	0.006 (0.76)	0.006 (0.64)	0.007 (0.77)
<i>Treat × Campaign × Target</i>	0.036** (2.28)			
<i>Treat × Post × Target</i>	0.021 (1.26)			
<i>Treat × Campaign × High_target</i>		0.025** (2.19)		
<i>Treat × Post × High_target</i>		0.003 (0.23)		
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Firm clustered SE	Yes	Yes	Yes	Yes
Quarter clustered SE	Yes	Yes	Yes	Yes
Observations	27,166	27,166	5,315	21,849
R2	0.10	0.10	0.14	0.09

Control sample: market capitalization one quarter before the allegation

Abnormal accruals are measured with a Modified Jones with piecewise linear *ROA*, *SG* and *MtB*

The relevant single variables and interacted variables are included in the regression

High_Target takes the value 1 if the downside target (*Target_Pct*) is above the 75th percentile

Observations with missing downside target are not considered

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Table 8– Impact on earnings management after other channel reaction

$$Accruals = \beta_0 + \beta_1 Treat \times Campaign + \beta_2 Treat \times Post + \beta_3 Treat \times Campaign \times Conf_call + \beta_4 Treat \times Post \times Conf_call + Controls + Fixed\ effects + \varepsilon$$

	Full sample	With conference call	Without conference call
<i>Treat × Campaign</i>	0.008* (1.81)	0.061** (2.30)	0.007* (1.76)
<i>Treat × Post</i>	0.005 (1.08)	0.075* (1.76)	0.004 (0.99)
<i>Treat × Campaign × Conf_call</i>	0.027** (2.29)		
<i>Treat × Post × Conf_call</i>	0.043** (2.20)		
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes
Firm clustered SE	Yes	Yes	Yes
Observations	53,835	1,728	52,107
R2	0.097	0.10	0.10

Control sample: market capitalization one quarter before the allegation

Abnormal accruals are measured with a Modified Jones with piecewise linear *ROA*, *SG* and *MtB*

The relevant single variables and interacted variables are included in the regression

Conf_call takes the value 1 if a conference call is organized to respond short sellers' allegations

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Table 9– Impact of earnings management on subsequent stock returns

$$CAR(-1, k) = \beta_0 + \beta_1 Accruals \times Campaign + \beta_2 Accruals \times Post + \beta_3 Campaign + \beta_4 Post + \beta_5 Accruals + \text{Fixed effects} + \varepsilon$$

	<i>CAR(-1,1)</i>	<i>CAR(-1,21)</i>
<i>Abnormal accruals</i> × <i>Campaign</i>	-0.009 (-0.35)	-0.097** (-2.12)
<i>Abnormal accruals</i> × <i>Post</i>	0.016 (1.36)	-0.019 (-0.91)
<i>Campaign</i>	-0.009*** (-3.51)	-0.021*** (-4.94)
<i>Post</i>	-0.006** (-2.30)	-0.012** (-2.53)
<i>Abnormal accruals</i>	-0.010* (-1.73)	-0.030*** (-2.92)
<i>Constant</i>	0.002** (2.37)	0.014*** (7.94)
Firm FE	Yes	Yes
Quarter FE	Yes	Yes
Observations	24,635	24,556
R2	0.05	0.07

Sample: target firms

Abnormal accruals are measured with a modified Jones model with piecewise linear *ROA*, *SG* and *MtB*

All the CARs are winsorized at 1 and 99%

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Table 10 – Short interest following an allegation

$$SI = \beta_0 + \beta_1 \text{Treat} \times \text{Alleg Quarter} + \beta_2 \text{Treat} \times \text{Campaign} + \beta_3 \text{Treat} \times \text{Post} \\ + \beta_4 \text{Alleg Quarter} + \beta_5 \text{Campaign} + \beta_6 \text{Post} + \text{Controls} + \text{Fixed effects} + \varepsilon$$

	SI	SI	SI Max	SI Max
<i>Treat</i> × <i>Alleg Quarter</i>	0.040*** (9.41)	0.037*** (9.11)	0.049*** (9.84)	0.046*** (9.44)
<i>Treat</i> × <i>Campaign</i>	0.045*** (9.72)	0.040*** (9.16)	0.049*** (9.67)	0.045*** (9.14)
<i>Treat</i> × <i>Post</i>	0.025*** (4.79)	0.022*** (4.15)	0.027*** (4.66)	0.024*** (4.07)
<i>Alleg Quarter</i>	0.000 (0.13)	0.000 (0.09)	0.000 (0.19)	0.000 (0.19)
<i>Campaign</i>	0.002 (0.83)	0.002 (0.64)	0.001 (0.52)	0.001 (0.35)
<i>Post</i>	0.005 (1.39)	0.005 (1.53)	0.005 (1.16)	0.005 (1.27)
<i>Market capitalization</i>		0.007*** (3.03)		0.007*** (2.93)
<i>BtM</i>		0.002 (1.40)		0.001 (1.00)
<i>Momentum</i>		-0.008*** (-6.95)		-0.008*** (-6.37)
<i>Constant</i>	0.055*** (54.39)	0.012 (0.79)	0.065*** (58.00)	0.018 (1.05)
Firm FE	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Firm clustered SE	Yes	Yes	Yes	Yes
Quarter clustered SE	Yes	Yes	Yes	Yes
Observations	60,223	58,787	60,223	58,787
R2	0.57	0.59	0.56	0.58

Control sample: market capitalization one quarter before the allegation

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Table 11 – Earnings management with control sample based on short interest

$$Accruals = \beta_0 + \beta_1 Treat \times Campaign + \beta_2 Treat \times Post + \beta_3 Campaign + \beta_4 Post + Controls + Fixed\ effects + \varepsilon$$

	Total accruals	Jones	Modified Jones	Linear		Piecewise linear	
				Jones	Modified Jones	Jones	Modified Jones
<i>Treat × Campaign</i>	0.007* (1.71)	0.009* (1.85)	0.005 (0.87)	0.006* (1.74)	0.007* (1.82)	0.009* (2.01)	0.009** (2.02)
<i>Treat × Post</i>	0.006 (1.13)	0.007 (1.42)	0.005 (0.97)	0.002 (0.56)	0.003 (0.62)	0.006 (1.09)	0.005 (0.96)
<i>Campaign</i>	0.001 (0.49)	0.006* (1.73)	0.006* (1.88)	0.002 (0.81)	0.001 (0.61)	-0.000 (-0.04)	-0.001 (-0.25)
<i>Post</i>	0.002 (0.55)	0.010*** (3.41)	0.010*** (3.43)	0.004** (2.28)	0.004** (2.29)	0.002 (0.52)	0.001 (0.43)
<i>Size</i>	-0.017*** (-3.37)	-0.027*** (-4.70)	-0.028*** (-4.83)	-0.007 (-1.43)	-0.007 (-1.50)	-0.010* (-1.89)	-0.010* (-1.90)
<i>Leverage</i>	0.002 (0.65)	0.005 (1.12)	0.005 (1.20)	-0.002 (-0.72)	-0.002 (-0.80)	-0.001 (-0.29)	-0.001 (-0.35)
<i>Investment</i>	0.122 (1.25)	0.206* (1.94)	0.186* (1.76)	-0.007 (-0.08)	-0.005 (-0.05)	0.012 (0.14)	0.013 (0.14)
<i>Inventory</i>	0.148*** (3.69)	0.129** (2.65)	0.157*** (3.02)	0.108*** (3.98)	0.115*** (3.96)	0.114*** (3.49)	0.129*** (3.58)
<i>ROA</i>	0.748*** (32.25)	0.625*** (21.57)	0.626*** (19.80)				
<i>SG</i>	-0.004** (-2.26)	-0.005** (-2.68)	-0.003 (-1.54)				
<i>MtB (t-1)</i>	-0.000 (-0.97)	-0.000 (-1.43)	-0.000 (-1.17)				
<i>Constant</i>	0.082** (2.22)	0.160*** (4.13)	0.165*** (4.19)	0.032 (0.96)	0.034 (1.02)	0.050 (1.34)	0.051 (1.33)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	No	No	No	No	Yes	Yes
Firm clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter clustered SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	56,174	55,169	54,362	55,074	54,258	55,947	55,140
R2	0.82	0.65	0.65	0.11	0.11	0.09	0.09

Control sample: short interest at quarter of allegation in the aggregate data

t statistics in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01 (two sided)

Figure 1 – Timeline

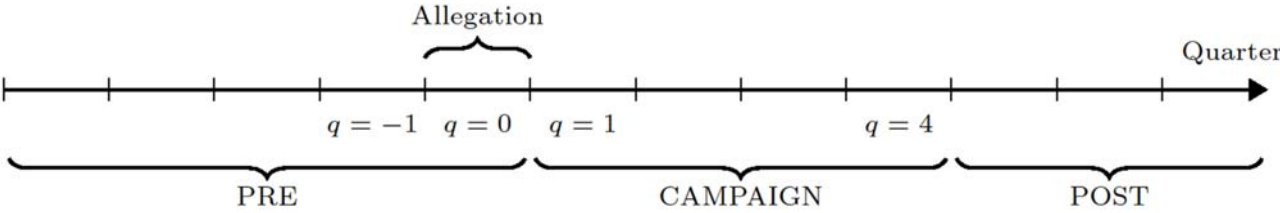


Figure 2 – Impact of the allegations on earnings management

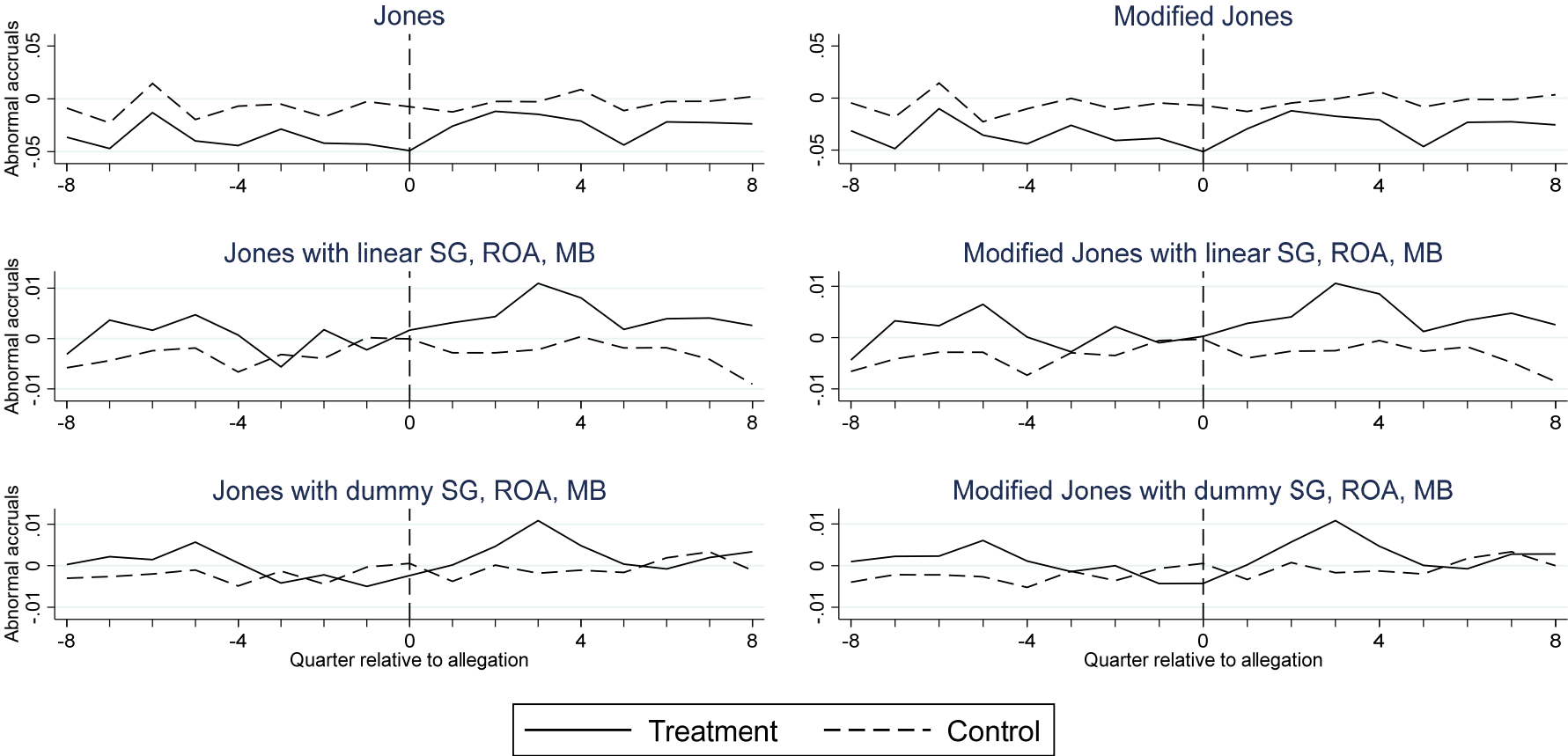


Figure 3 – Timeline for the market reaction following earnings management

