# Activist Hedge Funds and Firm Disclosure

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September 2015

*Review of Financial Economics, Forthcoming*

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## Abstract

This study examines whether firms' disclosure decisions are affected by the presence of activist hedge funds. Using a large sample of firms that experienced increases in ownership by activist hedge funds, we find that firms are more likely to cease providing financial guidance or reduce the information in the guidance in the quarter subsequent to new investment by activist hedge funds. These results hold even for firms that experienced good quarters and consistently provided guidance in previous quarters. Since guidance has been shown to be beneficial to capital market participants in many ways, reduced guidance has meaningful market implications. Our findings highlight a negative and possible unintended consequence of activist hedge funds' investment in firms, which provides some counterbalance to the numerous positive consequences documented in the prior literature on hedge fund activism.

## 1. Introduction

This study examines a possible unintended consequence of activist hedge funds' investment in firms—a reduction in firms' voluntary disclosure. The prior literature on activist hedge funds has documented numerous positive consequences after their investment in firms, including reduced agency costs (Brav, Jiang, Partnoy, & Thomas, 2008; Clifford, 2008; Klein and Zur, 2009), improved corporate innovation, productivity, and tax planning (Brav, Jiang, Ma, & Tian, 2015; Brav, Jiang, & Kim, 2015; Cheng, Huang, Li, & Stanfield, 2012), reduced earnings management (Hall & Trombley, 2012), and greater accounting conservatism (Cheng, Huang, & Li, 2015). However, little research has focused on governance reforms involving disclosure practices, as evidence has been based on a small number of cases in which activist hedge fund blockholders (who own >5% equity) expressly state in Schedule 13D filings that they seek more information disclosure from target firms (e.g., Brav et al., 2008).[1] There has also been limited evidence of negative capital market consequences of activist hedge funds' investment in firms. We posit that, on a broader scale, a possible negative consequence is firms' reduced likelihood to issue public management forecasts, also known as management guidance, after investment by activist hedge funds.

Some institutional evidence suggests that firms reevaluate their policies regarding guidance as activist hedge funds begin to take initial positions in the firms. Firms cognizant of being targeted by an activist hedge fund or a "wolf pack" of funds (Briggs 2007) are advised by numerous law firms and investment banks to regularly monitor changes in activist hedge fund holdings and to prepare for potential confrontational campaigns by continuously reviewing

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[1] Section 13(d) of the 1934 Exchange Act mandates investors to file with the SEC within 10 days of acquiring more than 5% of any class of securities of a publicly traded company if they have an interest in influencing the management of the company. Alternatively, investors may file a simpler 13G within 45 days of the end of the calendar year if they do not intend to attempt to change control of the issuer.

external communications policies (Christopher & Sheng, 2007; Zenner, Gosebruch, & Berkovitz, 2010; Lipton, 2013; Gelles, 2013; Sullivan & Cromwell, 2013).  Since activist hedge funds tend to target firms with predictable revenues and positive cash flows (Brav et al., 2008; Klein & Zur, 2009), firms that provide long-term guidance have been susceptible to becoming a target (NIRI, 2006).  This scenario suggests that firms that have detected even small increases in ownership by one or more activist hedge funds may reduce the guidance information that they provide to avoid attracting further attention from the funds.

We also posit that firms' ability to forecast future financial results, which directly affects their propensity to issue guidance, is reduced by the governance reforms documented in prior studies.  Once activist funds begin proactive campaigns against firms, the actions they initiate include requesting meetings with management, seeking board representation, filing formal shareholder proposals, recommending disposal of unproductive assets, demanding changes in capital structure, and lobbying for the sale of the entire firm (Brav et al., 2008; Clifford, 2008; Klein & Zur, 2009; Greenwood & Schor, 2009).  Under these conditions in which a firm's operating, investing, and financing environment is in flux, it would not be surprising for new or existing management to lose some ability to accurately forecast future sales, expenses, earnings, and cash flows.  Therefore, even though activist hedge funds may not explicitly demand governance reforms related to firms' disclosure practices in general, and guidance policies in particular, an unintended consequence can be the cessation or reduction in guidance information provided to capital market participants.

Since firms' guidance has been shown to be beneficial to capital market participants in many ways (Ball & Shivakumar, 2008; Beyer, Cohen, Lys, & Walther, 2010), including increased stock liquidity (Balakrishnan, Billings, Kelly, & Ljungqvist, 2014) and reduced stock

volatility (Billings, Jennings, & Lev, 2015), reduced guidance has meaningful market implications. Reductions in firms' guidance have also been shown to be associated with increases in analyst forecast dispersion and decreases in forecast accuracy (Chen, Matsumoto, & Rajgopal, 2011), suggesting greater market uncertainty regarding firms' future earnings.

We begin our empirical analysis by examining the quarterly guidance decisions from 1999 to 2011 for a large sample of firms owned by one or more of the activist hedge funds identified in Brav et al. (2008).[2] To control for potential self-selection bias arising from activists' possible preference for firms with less transparency and limited disclosure practices, we use a propensity score-matched control sample of firms with similar likelihood of ownership by activist hedge funds. Our sample consists of 6,127 firm-quarters from 2,689 unique firms and an equivalent number of firm-quarters from control firms. We use regressions in which the variables are measured in changes rather than levels because they are less prone to a correlated omitted variables problem and eliminate firm fixed effects, and we use lead-lag change regressions to test two directions of causality. To isolate new investment in a firm by activist hedge funds, which are our construct of interest, we measure changes in both new and existing investments by activist hedge funds for each firm-quarter.

Our first finding is that firms are less likely to provide any type of guidance in the quarter subsequent to an increase in first-time ownership by activist hedge funds. This result holds after controlling for changes in ownership by other institutional investors, changes in analyst coverage, and changes in firm and stock characteristics that may be associated with firms' guidance decisions. To investigate whether this result is spurious or correlated with poor firm

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[2] We thank Wei Jiang and her coauthors for sharing an updated list of activist hedge funds used in Brav et al. (2008). We obtain all firms owned by the funds using the Thomson Reuters Schedule 13F database, which contains the equity holdings of all institutional investors with over $100 million in assets or hold over 10,000 shares of a given stock.

performance, we repeat the analysis on a subsample of firms that consistently provided guidance in previous quarters and also met or exceeded the analyst consensus earnings estimate for the quarter. We find that even these types of "consistent guider firms" that experienced good quarters are less likely to provide guidance after an increase in first-time ownership by activist hedge funds.

We next examine whether two aspects of guidance change even if firms continue to provide guidance after initial activist hedge fund investment. We find that firms tend to reduce the precision of their guidance, as well as the amount of guidance, after an increase in first-time ownership by activist hedge funds. For example, guidance for revenue and point earnings-per-share (EPS) targets can be reduced to only range EPS targets in the subsequent quarter. These results also hold for the subsample of consistent guiders that met or exceeded analyst expectations. Thus, even if firms continue to provide some guidance, there tends to be less information in the guidance.

We test the opposite direction of causality by regressing prior quarter's change in guidance on current quarter's change in activist hedge fund ownership. We do not find any associations between prior quarter's change in guidance, precision of guidance, or amount of guidance and current quarter's change in new or existing ownership by activist hedge funds. Therefore, we only find that changes to firms' guidance decisions tend to come after investment by activist hedge funds.

In additional analyses, we relate to prior studies that have used smaller samples (relative to this study) in which an activist files a Schedule 13D for a target firm (e.g., Brav et al., 2008; Klein & Zur, 2009). While we do not limit our sample solely to these cases, we create a reduced sample in which total activist hedge fund investment in a firm is at least 5%, and include an

indicator variable in our regressions for whether a Schedule 13D or 13D/A was filed by any activist hedge fund during the quarter. We again find that firms are more likely to cease guidance, reduce precision in the guidance, and reduce the amount of guidance in the quarter subsequent to an increase in first-time ownership by activist hedge funds. We then examine longer-term guidance patterns for a subset of firms that decreased their incidence, precision, or amount of guidance and find that the reduced guidance persists into future quarters. Lastly, we check that our results are robust to the measurement error documented by Chuk, Matsumoto, & Miller (2012) in the First Call Company Issue Guidance (CIG) database.[3]

Our study contributes to the literatures in activist hedge funds and firms' voluntary disclosure decisions, namely management guidance. We show that one unintended consequence of activist hedge funds' investment in firms is a reduction in the firms' guidance information. Since guidance has been shown to be beneficial to capital market participants in many ways, reduced guidance has meaningful market implications. In addition, because we do not limit our sample to only cases in which a Schedule 13D is filed by an activist hedge fund, our results suggest that any other potential consequences of their ownership in firms are likely to be more subtle than previously examined. Our findings may be generalized to suggest that other corporate governance issues can be affected by activist hedge funds without a public hostile or non-hostile campaign against management.

The remainder of this paper is organized as follows. In the next section, we review the prior literatures on activist hedge funds. In Section 3, we describe our sample and data. Section

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[3] A common challenge we have with other disclosure studies is that firms' disclosure decisions and the factors that affect them are not directly observable. As a consequence, even though we use a propensity-matched control sample, run lead-lag change regressions, and form several subsamples to further test our hypothesis, our findings should be interpreted with this caveat.

4 discusses our empirical analyses and results. We conduct additional robustness checks in Section 5. Finally, we conclude in Section 6.

## 2. Literature Review and Hypothesis Development

*2.1 Activist Hedge Funds*

There is an emerging literature in finance and accounting that examines the effect of activist hedge funds on the firms they target. One group of studies was the first to document the types of activism undertaken by the hedge funds, the responses of targeted firms, and the success rate of the funds to affect changes in subsequent firm performance, CEO turnover and pay, leverage, dividend payouts, and takeover likelihood (Brav et al., 2008; Clifford 2008; Klein & Zur, 2009; Greenwood & Schor, 2009). Subsequent studies show that hedge fund activism leads to improved corporate innovation (Brav et al., 2014) and long-term productivity (Brav et al., 2015). These studies also provide compelling evidence that the observed changes in the firms were a direct result of the hostile or non-hostile activism championed by the hedge funds, rather than a simple correlation between the hedge fund investment and firm outcomes. Accordingly, the studies document positive short- and long-term stock market reactions to initial announcements of hedge fund activism (the Schedule 13D filing). The evidence is consistent with activist hedge funds serving as effective monitors to reduce agency costs within firms and improve shareholder value.

Later studies examine how activist hedge funds influence specific accounting policies and outcomes, including tax planning and avoidance (Cheng et al., 2012), the use of discretionary accruals to manage earnings (Hall & Trombley, 2012), and the level of accounting conservatism in financial reporting (Cheng et al., 2015). This evidence is also consistent with

the increased monitoring role of activist hedge funds and illustrates how their presence affects firms' accounting choices.

However, there is very little research that documents any negative consequences of activist hedge funds' investment in firms. A few studies suggest that credit risk and the cost of debt increase as a result of some of the hedge fund actions (Klein & Zur, 2011; Xu & Li, 2010; Sunder, Sunder, & Wonsunwai, 2014), consistent with a transfer of wealth in some cases from bondholders to shareholders. Moreover, there is no large-sample evidence on activists' influence on governance reforms involving disclosure practices. Limited evidence comes from Brav et al. (2008), who find that 36.5% of the hedge fund activism events in their study include a stated objective related to corporate governance, of which only 5.5% expressly mention a demand for more information disclosure. In these few disclosure cases, they find a 68.4% success or partial success rate in achieving the stated objective, although it is unknown which specific disclosure practices are affected. The purpose of this study is to fill a gap in this literature and to examine a potential negative consequence of activism related to firms' information disclosure environment.

Common to the aforementioned studies is that they constructed samples of firms and activist hedge funds from collecting Schedule 13D filings. As a result, cases in which activist hedge funds own less than 5% of a firm's shares outstanding are typically excluded from the studies. One exception is Becht, Franks, Mayer, & Rossi (2009), who use data from a single British activist fund to document the fund's actions towards firms in which the fund's investment level is below the UK disclosure threshold of 3%. They illustrate that this activist hedge fund engages with firms' board members, executive management, and other stakeholders often when regulatory filings are not mandated. As we discuss further in Section 3, we include such cases

because we believe potential consequences of activist hedge fund ownership on firms' behaviors can be more subtle than previously examined.

*2.2 Hypothesis Development*

We posit that there are two mechanisms by which firms may reduce guidance information after investment by activist hedge funds. The first relates to firms reevaluating all their external communications policies after detecting initial investment by one or more well-known activist funds. Firms that are cognizant of becoming potential targets are advised by law firms (Christopher & Sheng, 2007; Lipton, 2013; Sullivan & Cromwell, 2013), investment banks (Zenner et al., 2010), and economic research groups (Tonello, 2008) to regularly monitor when such funds take initial positions in the firm and to evaluate communication strategies to fend off possible activism campaigns against the firm. Activist hedge funds tend to target firms with predictable revenues and positive cash flows (Brav et al., 2008; Klein & Zur, 2009), and as a result, firms that provide long-term guidance have been susceptible to becoming a target (NIRI, 2006). This scenario suggests that firms may react to initial investment by activist funds by reducing the amount of guidance information they provide to avoid attracting further attention from the funds.

The second mechanism relates to the underlying process by which guidance information is generated—the ability of senior management to forecast future financial results—and subsequently disrupted by one or more governance reforms initiated by activist hedge funds. Once activist funds begin proactive campaigns against firms, the actions they initiate include requesting meetings with management, seeking board representation, filing formal shareholder proposals, recommending disposal of unproductive assets, demanding changes in capital structure, and lobbying for the sale of the entire firm (Brav et al., 2008; Clifford, 2008; Klein &

Zur, 2009; Greenwood & Schor, 2009). Under these conditions in which a firm's operating, investing, and financing environment is in flux, it would not be surprising for management to lose some ability to accurately forecast future sales, expenses, earnings, and cash flows. Thus, even though activist hedge funds may not explicitly demand governance reforms related to firms' disclosure practices in general, and guidance policies in particular, an unintended consequence can be the cessation or reduction in guidance information provided to capital market participants. In summary, based on the aforementioned mechanisms, we hypothesize that firms tend to reduce guidance information after investment by activist hedge funds.

## 3. Data

*3.1 Sample Selection*

Our sample of activist hedge funds is based on the sample used in Brav et al. (2008), which consists of 236 funds identified from Schedule 13D filings from 2001 to 2006 and is augmented by the authors' news and internet searches. We are then able to collect information about the equity holdings for 203 of the funds from Thomson Reuter's database of quarterly Schedule 13F filings. After this step, we require stock data from CRSP, quarterly financial information from Compustat, guidance data from First Call's Company Issued Guidance (CIG) database, and analyst coverage data from I/B/E/S. Our sample period begins in the first calendar quarter of 1999 because Chuk et al. (2012) find that First Call's data becomes more comprehensive in 1998; our sample period ends in the second calendar quarter of 2011 because that is the last quarter that guidance data is available from the CIG database.

To increase the likelihood that we can empirically detect changes in firms' quarterly guidance decisions that may be related to new investment by activist hedge funds, we narrow our

sample of firm-quarters to those in which activist funds have established at least a noticeable level (to firm management) of ownership in a firm. We choose 1.0% level of ownership (of shares outstanding), which is admittedly arbitrary, but we obtain similar inferences when we use higher levels such as 2.0% and 3.0%, although these thresholds result in much smaller sample sizes.[4] Given this requirement, we obtain a sample of 6,127 firm-quarters from 2,689 unique firms where the mean level of initial ownership is 2.5%. Table 1, Panel A provides a breakdown of the sample by year and quarter. The number of firm-quarters is higher in the 2003-2007 period relative to the years before and after that period.

We create a propensity score-matched control sample by modeling activist hedge funds' choice to establish new positions (of at least 1%) in firms. We include variables that have been shown in prior studies to be determinants of activists' decision to invest in target firms (discussed further in Section 4). For each quarter in our sample, we match one sample firm to a control firm with the closest propensity score. This procedure yields 6,127 firm-quarters from 2,693 unique control firms, resulting in 12,254 firm-quarters for our full-sample regressions.

*3.2 Variable Measurement: Dependent Variables*

We use management guidance data from First Call's Company-Issued Guidance (CIG) database to construct three different measures of quarterly guidance.[5] The first variable is a dummy variable for whether firm $i$ provided any type of guidance during quarter $t$ ($DGUIDE_{i,t}$). To avoid misclassifying firms that may not be covered by First Call (Chuk et al., 2012), we only include firms in our sample that are covered by First Call.[6] Second, conditional on the presence

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[4] For a minimum 2% level of ownership, our sample reduces to 3,113 firm-quarters from 1,236 unique firms. At 3% minimum ownership, the sample reduces to 1,836 firm-quarters from 526 unique firms. In either case, the inferences from the results discussed in Section 4 remain the same.

[5] Such data has been used in numerous empirical studies of firms' voluntary disclosure (Waymire, 1984; Pownall & Waymire, 1989; Lev & Penman, 1990; Hutton, Miller, & Skinner, 2003; Ajinkya, Bhojraj, & Sengupta, 2005; Chen, Matsumoto, & Rajgopol, 2011).

[6] In Section 5.2, we discuss potential measurement error arising from the First Call database.

of guidance, we define the precision of guidance *PRECGUIDE$_{i,t}$* for firm *i* in quarter *t* as follows. *PRECGUIDE* is coded as 4 for a point estimate (most precise), 3 for a two-sided bound range estimate, 2 for a one-sided bound range, and 1 for only a qualitative estimate.[7] For example, guidance issued as "comfortable with $0.76" is coded as 4, "between $0.40 and $0.43" is coded as 3, "less than $0.69" is coded as 2, and "not comfortable with expectations" is coded as 1. Prior papers have defined precision similarly (Baginski, Conrad, & Hassell, 1993; Ajinkya et al., 2005). Third, again conditional on the presence of guidance, we define the amount of guidance as the number of guidance observations (*NUMGUIDE$_{i,t}$*) in the CIG database for firm *i* in quarter *t*, regardless of the guidance type (e.g., EPS or revenue), horizon (e.g., for the current quarter or the next year), nature (e.g., qualitative or quantitative), or timing (e.g., issued on the same or different date). This variable captures the richness and scope of the guidance information (Anantharaman & Zhang, 2011).

*3.3 Variable Measurement: Independent Variable of Interest*

Our interest is in examining how new investment by activist hedge funds may affect firms' guidance decisions. Using institutional ownership data from Thomson Reuter's database of quarterly Schedule 13F filings, we compute the level of ownership that each activist fund has in each firm as of the end of each calendar quarter in our sample period. We first define *PIO_AHF$_{i,t}$* as the percentage of institutional ownership (i.e., shares outstanding) held by all activist hedge funds in firm *i* as of the end of quarter *t*. We then distinguish first-time ownership (i.e., the first quarter in which the activist fund owns the firm) from existing ownership (i.e., not the first quarter of ownership), and define variables *PIO_AHF_1STQ$_{i,t}$* and

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[7] For 95% of our sample, guidance is for earnings-per-share (EPS).

*PIO_AHF_EXISTING$_{i,t}$*, respectively.[8]  In regressions in which the variables are measured in changes, *ΔPIO_AHF_1STQ$_{i,t}$* is equivalent to *PIO_AHF_1STQ$_{i,t}$* because, by definition, a given activist fund has no investment in a firm prior to its first quarter of investment.

*3.4 Control Variables*

We include a number of control variables that have been shown in prior studies to be determinants of firms' voluntary disclosure decisions.  We control for the percentage of institutional ownership *not* held by activist hedge funds (*PIO_NONAHF$_{i,t}$*).  We also control for firm size, profitability, leverage, and growth opportunities (Lang & Lundholm, 1993; Frankel, Johnson, & Skinner, 1999).  We measure these firm characteristics, respectively, using the log of the market value of equity (*Firm Size*), and the ratios return-on-assets (*ROA*), debt-to-equity (*Leverage*) and book-to-market (*Book-to-Market*).  All financial data come from Compustat and are measured for firm *i* in fiscal quarter *t*.[9]  Analyst coverage is defined as the number of analysts (*Num Analysts*) in I/B/E/S who issued any type of EPS forecast for the firm during calendar quarter *t*.  We also control for three stock characteristics: *Stock Return*, defined as the size-adjusted return (raw return minus CRSP-size decile return), *Stock Turnover*, defined as the average monthly turnover (shares traded divided by shares outstanding), and *Stock Volatility,* defined as the standard deviation of daily size-adjusted returns.  All stock data come from CRSP and are measured over calendar quarter *t*.[10]  All variable definitions are summarized in the appendix.

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[8] For example, consider the case in which Activist Hedge Fund "X" invests in Firm A for the first time during quarter *t*, acquiring 1% of Firm A's shares outstanding, but then does not acquire (nor sell) any more shares during quarter *t+1*.  Further assume that no other activist hedge funds have invested in Firm A.  For quarter *t*, *PIO_AHF*=0.01, *PIO_AHF_1STQ*=0.01, and *PIO_AHF_EXISTING*=0.  For quarter t+1, *PIO_AHF*=0.01, *PIO_AHF_1STQ*=0, and *PIO_AHF_EXISTING*=0.01.

[9] If a firm's fiscal quarter does not coincide with a calendar quarter, then we use the most recent fiscal quarter that ended prior to the end of the calendar quarter.

[10] All control variables have been winsorized at the 1st and 99th percentiles.

## 4. Empirical Analyses

### 4.1 Propensity Score Matching

We create a propensity score-matched control sample of firms that are similarly likely to experience new investment by activist hedge funds in a given quarter. Prior studies have shown that activist hedge funds tend to invest in firms that are relatively smaller, more profitable, have higher cash flow, more analyst and institutional investor following, but have lower growth, leverage and stock returns (Brav et al., 2008; Klein & Zur, 2009). Therefore, we estimate a logistic regression in which the dependent variable is an indicator for whether firm *i* has experienced new ownership by activist hedge funds of at least 1% of shares outstanding in quarter *t* (*AHFINVEST$_{i,t}$*) and the independent variables are measured in quarter *t-1*.

$$P(AHFINVEST_{i,t}=1) = \beta_0 + \beta_1(Firm\ Size_{i,t-1}) + \beta_2(ROA_{i,t-1}) + \beta_3(Book\text{-}to\text{-}Market_{i,t-1})$$
$$+ \beta_4(Leverage_{i,t-1}) + \beta_5(Sales\ Growth_{i,t-1}) + \beta_6(Cash\&STInvestments_{i,t-1})$$
$$+ \beta_7(Stock\ Return_{i,t-1}) + \beta_8(Institutional\ Own_{i,t-1}) + \beta_9(Num\ Analysts_{i,t-1})$$
$$+ Year\ Fixed\ Effects + \varepsilon_{i,t} \qquad (1)$$

*Sales Growth* is defined as growth in quarterly revenue from the prior year's quarter, *Cash&STInvestments* is the firm's cash plus short-term investments scaled by total assets, *Institutional Own* is the total percentage of shares outstanding held by all institutional investors, and all other variables are previously defined. All firm-quarters with requisite data from Compustat, CRSP, I/B/E/S, and Thomson Reuters are included in the regression.

The results of this logistic regression are presented in Table 1, Panel B. We find that all of the explanatory variables are significant except for return-on-assets (*ROA*). Next, for each firm in our sample, we match a non-activist invested firm in the same quarter with the closest propensity score. To assess the effectiveness of the matching procedure, we evaluate the covariate balance between the two samples; i.e., whether the activist-invested and control samples are similar along the nine variables included in our model. Table 1, Panel C, shows the

mean and median values from each sample and tests for differences using a two-tailed *t*-test for means and a Wilcoxon signed ranked test for medians. None of the differences in the means are statistically significant and a few of the differences in the medians are significant. Notwithstanding these few differences, the two groups are fairly matched along all the other observable characteristics.

*4.2 Descriptive Statistics*

Table 2 provides descriptive statistics of the variables from the full sample of 12,254 firm-quarters used in the regressions. Since we run our main tests using variables measured in changes (discussed in the next subsection), panel A shows the distribution of the variables measured in levels and Panel B shows the distribution of the variables measured in changes (from the level in quarter *t-1* to quarter *t*). We find that 47% of firms provide some type of guidance in a given quarter (mean *DGUIDE*=0.47), and conditional on the presence of guidance, the mean precision of guidance (*PRECGUIDE*) is 3.12 and amount of guidance (*NUMGUIDE*) is 1.77. These statistics indicate that guidance tends to include two forecasts (e.g., quarterly EPS and annual EPS) and involve a two-sided bound range of targets. In terms of quarter-over-quarter changes in guidance information, the mean change in the indicator variable *(ΔDGUIDE)* is zero, the mean change in precision *(ΔPRECGUIDE)* is 0.33, and the mean change in the amount of guidance *(ΔNUMGUIDE)* is 0.17.[11] The median changes are all zero. These statistics indicate that, on average, sample and control firms tend not to change guidance information from quarter to quarter, but if they do, then there tends to be a slight increase in the precision and amount of guidance.

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[11] The distributions of $\Delta PRECGUIDE_t$ and $\Delta PRECGUIDE_t$ are conditional on $DGUIDE_{t-1}$=1 or $DGUIDE_t$=1. In other words, in order for there to be a meaningful change in the current quarter's precision and amount of guidance, there must have been guidance provided in either the prior quarter or the current quarter.

Before testing our hypothesis formally in a multivariate setting, we examine descriptive evidence about whether sample firms are more likely than control firms to cease or reduce guidance information. Panel C shows firm-level statistics (i.e., each firm is counted once) for the number of sample firms that changed or did not change their guidance behavior after new investment by activist hedge funds, along with comparable changes in guidance from control firms. Out of the 2,689 firms in our sample that experienced new activist investment in a given quarter, 678 firms (25%) stopped providing guidance in the following quarter, which is more than double the 328 firms (12%) that started providing guidance in the following quarter, while the remaining firms did not change their previous decision to provide or not provide guidance. Among the control firms, 477 firms (18%) stopped providing guidance, and the difference from sample firms is significant at the 1% level based on a chi-squared ($\chi^2$) test. Thus, the number of sample firms that ceased guidance is substantially greater than the number of control firms that ceased guidance and the number of sample firms that initiated guidance.

We also count the number of firms that continued to provide guidance but changed their precision or amount of guidance. Of the 747 sample firms that did not stop providing guidance, 100 firms (13%) decreased their precision of guidance and 279 firms (37%) decreased their amount of guidance.[12] By comparison, 10% of the control firms in this scenario decreased their precision of guidance and 34% of firms decreased their amount of guidance. There are also instances of sample and control firms that increased their precision and amount of guidance, but they are smaller in frequency than the aforementioned decreases in precision and amount. Overall, the frequencies of each scenario presented in Panel C provide some descriptive evidence that sample firms are more likely than control firms to cease or reduce guidance information after new investment by activist hedge funds. However, these comparisons do not take into

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[12] We track the longer-term guidance patterns for these specific firms and discuss the findings in Section 5.2.

account the magnitude of new activist investment nor do they control for other factors. Therefore, we next test our hypothesis in a multivariate setting.

*4.3 Regression Analyses*

To test formally whether new investment by activist hedge funds affect firms' guidance decisions (controlling for other factors) through either of the two mechanisms discussed in Section 2, we conduct a changes analysis. A regression where the variables are measured in changes is less prone to a correlated omitted variables problem, eliminates firm fixed effects, and provides a stronger test of an association than when the variables are measured in levels (O'Brien & Bhushan, 1990). Importantly, it allows us to run lead-lag regressions to specifically examine whether changes in activist hedge fund ownership (new and existing) in the current quarter lead to changes in guidance in the following quarter, controlling for changes in other determinants of guidance. Specifically, we estimate the following regression equation:

$$
\begin{aligned}
\Delta Guidance_{i,t+1} = {} & \beta_0 + \beta_1(\Delta PIO\_AHF\_1STQ_{i,t}) + \beta_2(\Delta PIO\_AHF\_EXISTING_{i,t}) \\
& + \beta_3(\Delta PIO\_NONAHF_{i,t}) + \beta_4(\Delta Num\ Analysts_{i,t}) + \beta_5(\Delta Firm\ Size_{i,t}) \\
& + \beta_6(\Delta ROA_{i,t}) + \beta_7(\Delta Book\text{-}to\text{-}Market_{i,t}) + \beta_8(\Delta Leverage_{i,t}) + \beta_9(\Delta Stock\ Return_{i,t}) \\
& + \beta_{10}(\Delta Stock\ Liquidity_{i,t}) + \beta_{11}(\Delta Stock\ Volatility_{i,t}) + Year\ Fixed\ Effects + \varepsilon_{i,t} \quad (2)
\end{aligned}
$$

The dependent variable $\Delta Guidance_{i,t+1}$ represents next quarter's change in each of our three guidance variables $\Delta DGUIDE_{i,t+1}$, $\Delta PRECGUIDE_{i,t+1}$, and $\Delta NUMGUIDE_{i,t+1}$, and all independent variables are quarter-over-quarter changes (from quarter *t-1* to quarter *t*) of the variables previously defined.[13]

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[13] We conducted multicollinearity diagnostics whenever pairs of independent variables had correlations above |0.4|. This was only the case for the following five pair-wise correlations: ρ(ΔFirm Size, ΔBook-to-Market), ρ(ΔFirm Size, ΔLeverage), ρ(ΔFirm Size, ΔStock Return), ρ(ΔLeverage, ΔBook-to-Market), and ρ(ΔStock Turnover, ΔStock Volatility). In each case, we found that the variance inflation factors were below 2 for all the variables included in the regression, suggesting that multicollinearity is not a serious problem in our tests.

The results of this regression equation are presented in Table 3, Panel A. The first three columns contain coefficients estimated from regressions using the entire sample; significance tests are based on standard errors clustered by firm (Rogers, 1993). When the dependent variable is next quarter's change in the guidance indicator ($\Delta DGUIDE_{t+1}$), the possible values are -1, 0, and 1, corresponding to situations in which a firm ceased, did not change, or started providing guidance, respectively. Accordingly, we estimate a cumulative (also known as an ordered or ordinal) logistic regression for this dependent variable.[14] Column (1) shows that the coefficient on the variable of interest, the increase in first-time ownership by activist hedge funds ($\Delta PIO\_AHF\_1STQ_t$), is negative and significant at the 1% level. The coefficient of −4.82 translates into an odds ratio of 0.81% (exp(−4.82)), indicating that for an inter-quartile change in $\Delta PIO\_AHF\_1STQ_t$ from 0.00 to 0.02 (Table 2, Panel B), there would be a 9.2% increase in the odds ($1-0.0081^{0.02}$) that a firm would either cease or not start providing guidance. In contrast, the coefficient for the change in existing ownership by activist hedge funds ($\Delta PIO\_AHF\_EXISTING_t$) is insignificant, suggesting that it is only new investment by activist funds that are related to changes in firms' guidance decisions. In terms of the control variables, our results are consistent with findings from prior studies on management guidance. Firms are more likely to provide guidance when they are larger, have greater institutional ownership, have more leverage, and when they have less analyst coverage, lower returns, and less stock liquidity (e.g., Anantharaman & Zhang, 2011).

Columns (2) and (3) contain the results when the dependent variable is next quarter's change in the precision of guidance ($\Delta PRECGUIDE_{t+1}$) and the amount of guidance ($\Delta NUMGUIDE_{i,t+1}$), respectively. For these guidance variables to capture substantive changes to

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[14] In a cumulative logit model, the number of intercepts is one less than the number of categories on the dependent variable. We do not include them in Columns (1) and (4) of Table 3 because they lack substantive meaning (Allison, 1999).

firms' guidance information in quarter *t+1*, there must have been guidance provided in either quarter *t* or *t+1*. Once we impose this requirement, the sample size reduces to 6,759 firm-quarters. Also, while these regressions can also be estimated using cumulative logit models, we instead use Ordinary Least Squares (OLS) models to ease interpretation of the results.[15] We again find that the coefficient on the increase in first-time ownership by activist hedge funds ($\Delta PIO\_AHF\_1STQ_t$), is negative and significant at the 1% level in both columns, and most of the other results are similar to those shown in Column (1). These results indicate that when there is an increase in new investment by activist hedge funds, there tends to be either a complete stoppage of guidance, a decrease in the precision of guidance, or a reduction in the amount of guidance in the next quarter.

To investigate whether the above results are spurious or correlated with poor firm performance, we repeat the above regressions on a subsample of firms that both: 1) consistently provided guidance in previous quarters, and 2) met or exceeded the analyst consensus earnings estimate for the quarter. One would expect that these types of firms that experienced good quarters are ex ante less likely to stop or reduce guidance. We classify firms as "consistent guiders" as of a given quarter if they issued guidance in three of the prior four quarters or six of the prior eight quarters (Rogers, Skinner, & Van Buskirk, 2009; Li, Wasley, & Zimmerman, 2012). We then determine if these firms met or exceeded analyst expectations for the quarter, based on the latest mean consensus EPS prior to the earnings announcement. After requiring firms to meet these two conditions, we arrive at a subsample of 3,284 firm-quarters (from the original 12,254).

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[15] All results and inferences are similar using cumulative logit models. However, coefficient estimates and multiple intercepts are more difficult to interpret in nonlinear logit models. The results of such models are available upon request.

The results from running the regressions on this subsample of firms are presented in Columns (4) through (6) of Table 3, Panel A. In each column, the coefficient on the increase in first-time ownership by activist hedge funds ($\Delta PIO\_AHF\_1STQ_t$), is still negative and significant at the 5% or lower level, while the coefficient for the change in existing ownership by activist hedge funds ($\Delta PIO\_AHF\_EXISTING_t$) is insignificant. These results suggest that even firms with a consistent history of providing guidance and that experienced good quarters are less likely to provide guidance information after an increase in first-time ownership by activists.

In the next set of regressions, we test the opposite direction of causality—whether changes in firms' guidance decisions from the prior quarter are related to current quarter changes in investments by activist hedge funds. We estimate the following regression equation:

$$\Delta Guidance_{i,t-1} = \beta_0 + \beta_1(\Delta PIO\_AHF\_1STQ_{i,t}) + \beta_2(\Delta PIO\_AHF\_EXISTING_{i,t})$$
$$+ \beta_3(\Delta PIO\_NONAHF_{i,t}) + \beta_4(\Delta Num\ Analysts_{i,t}) + \beta_5(\Delta Firm\ Size_{i,t})$$
$$+ \beta_6(\Delta ROA_{i,t}) + \beta_7(\Delta Book\text{-}to\text{-}Market_{i,t}) + \beta_8(\Delta Leverage_{i,t}) + \beta_9(\Delta Stock\ Return_{i,t})$$
$$+ \beta_{10}(\Delta Stock\ Liquidity_{i,t}) + \beta_{11}(\Delta Stock\ Volatility_{i,t}) + Year\ Fixed\ Effects + \varepsilon_{i,t} \qquad (3)$$

The only difference between equations (2) and (3) is that the latter's dependent variables are changes measured for quarter *t-1* (rather than *t+1*).[16] With this specification, the changes in the dependent variables are measured with a one-quarter lag from the changes in the independent variables. If changes in firms' guidance decisions lead to future investment by activist hedge funds, then the coefficient for *($\Delta PIO\_AHF\_1STQ_t$)* should also be significant in equation (3).

The results of this regression equation are presented in Table 3, Panel B. The first three columns contain coefficients estimated from regressions using the entire sample, and the last

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[16] Specifically, the dependent variable $\Delta DGUIDE_{i,t-1}$ measures the change in guidance indicator for firm *i* from quarter *t-2* to *t-1*. For $\Delta PRECGUIDE_{i,t-1}$ and $\Delta NUMCGUIDE_{i,t-1}$ to capture meaningful changes in guidance for quarter *t-1*, there must have been guidance in quarter *t-2* or *t-1*.

three columns are for the subsample of consistent guiders that met or beat analyst expectations. We find that, across Columns (1) through (6), neither the coefficient on the increase in first-time ownership ($\Delta PIO\_AHF\_1STQ_t$) nor the coefficient on the increase in existing ownership ($\Delta PIO\_AHF\_EXISTING_t$) by activist hedge funds is significant. In terms of the control variables, we find that an increase in guidance information from the prior quarter is associated with an increase in stock return and a decrease in stock volatility in the current quarter, consistent with the beneficial capital market effects of guidance documented in prior studies (Balakrishnan et al., 2014; Billings et. al., 2015). Thus, we find no evidence of associations between prior quarter's change in guidance, precision of guidance, or amount of guidance and current quarter's change in new or existing ownership by activist hedge funds. We only find that changes to firms' guidance decisions tend to come after investment by activist hedge funds.

## 5. Additional Analyses and Robustness Checks

*5.1 Reduced-Sample Regression Analyses*

Prior studies on hedge fund activism have used samples in which an activist files a mandated Schedule 13D for a target firm (e.g., Brav et al., 2008; Klein & Zur 2009), resulting in smaller sample sizes compared with this study. We do not limit our sample solely to these cases because we believe there are possible intended and unintended consequences of activist hedge fund ownership even when ownership levels are below 5% and no Schedule 13Ds are filed. However, to relate our results to prior studies, we create a reduced sample in which total activist investment in a firm is at least 5% and include an indicator variable in our regressions for whether a Schedule 13D or 13D/A was filed by any activist hedge fund during the quarter (*SC13DA_AHF*). Our original sample of 12,254 firm-quarters is reduced to 4,074 firm-quarters

and we find 495 firm-quarters in which a Schedule 13D or 13D/A was filed.[17]  We estimate regression equation (2) with the inclusion of the indicator variable *SC13DA_AHF*.

Results of the reduced-sample regressions are presented in Table 4, Panel A.  Similar to the results from Table 3, Panel A, the coefficient on the increase in first-time ownership by activist hedge funds ($\Delta PIO\_AHF\_1STQ_t$) is negative and significant across Columns (1) through (3), albeit at only the 5% or 10% level.  The coefficients on the change in existing activist hedge fund ownership ($\Delta PIO\_AHF\_EXISTING_t$) and the indicator variable $SC13DA\_AHF_t$ are not significant.  These results indicate that our primary results discussed in Section 4 are robust to a significantly-reduced sample of cases in which activist hedge funds own larger stakes in firms and may have filed a Schedule 13D.

We also estimate regression equation (3) with the reduced sample and inclusion of indicator variable *SC13DA_AHF*.  The results are presented in Table 4, Panel B.  None of the variables of interest, changes in new or existing activist hedge fund ownership, is significant.  The lack of significance is consistent with the results from Table 3, Panel B, and indicates no evidence of associations between prior quarter's change in guidance and current quarter's change in ownership by activist hedge funds.

In summary, we believe our main findings extend the well-documented results from the prior studies on hedge fund activism and highlight an interesting negative consequence of activists' investment in firms.  Furthermore, the insignificance of *SC13DA_AHF* in both Panel A and B suggests that if we were to limit our sample to only cases in which a Schedule 13D is filed, our tests would likely lack sufficient power to empirically detect any associations between investment by activist hedge funds and firms' disclosure decisions.

*5.2 Longer-Term Guidance Patterns*

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[17] Excluding Schedule 13D/A filings would leave only 212 firm-quarters in which a 13D was filed.

Our main tests showed that sample firms tend to stop providing guidance in the quarter after (quarter *t+1*) new investment by activist hedge funds, and if they continue providing guidance, then the precision and amount of guidance tends to decrease. In this subsection, we track the longer-term guidance patterns (quarters *t+2* through *t+5*) of certain firms to examine if the guidance information returns to prior levels or remains limited in future quarters. We focus on three subset of sample firms that were identified in Panel C of Table 2—the 678 firms that stopped guidance, the 100 firms that continued guidance but decreased precision, and the 279 firms that continued guidance but decreased the amount of guidance.

Table 5 presents our findings. Out of the 678 firms that stopped guidance, only about one-third of them resumed guidance over the next four quarters, indicating that most of these firms continued to provide no guidance longer-term.[18] For the 100 firms that continued guidance but reduced precision, the mean value of *PRECGUIDE* decreased from 3.9 in quarter *t* to 2.8 in quarter *t+1* and remained close to 3.1 over the next four quarters. However, not all 100 firms continued to provide guidance over the next four quarters; this subset of firms declined to 76 firms in quarter *t+2* and 60 firms in quarter *t+5*. Regarding the 279 firms that continued guidance but reduced the amount, the mean value of *NUMGUIDE* decreased from 3.0 in quarter *t* to 1.5 in quarter *t+1* and remained close to 2.0 over the next four quarters. This subset of firms declined to 233 firms in quarter *t+2* and 193 firms in quarter *t+5*. In summary, our findings indicate that the decreases in the incidence, precision, and amount of guidance in the quarter immediately after new investment by activist hedge funds tend to persist into future quarters.

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[18] Interestingly, among the firms that resumed guidance, 76 firms stopped guidance again after another new investment by activist hedge funds, which supports our hypothesis. We thank an anonymous reviewer for this suggestion.

*5.3 Directional Change in Guidance*

In this subsection, we examine changes in the direction of guidance (rather than precision or amount). If firms attempt to avoid attracting further attention from activist hedge funds, then they may lower their guidance to appear less profitable. Starting with the 747 sample firms (Panel C of Table 2) that continued to provide guidance after new investment by activist hedge funds, we find 440 firms that updated guidance for their full-year EPS. The mean value of the guidance decreased from $1.74 in quarter $t$ to $1.69 in quarter $t+1$, and the difference is significant at the 1% level. This result is consist with our hypothesis, however, we note that it is also consistent with the guidance "walk down" behavior for a broad sample (not just those targeted by activist hedge funds) documented in Matsumoto (2002) and Richardson, Teoh, and Wysocki (2004). As a result, we interpret the directional change in guidance with this caveat.

*5.4 Potential Measurement Error in the Dependent Variables*

The three dependent variables used in our empirical tests, the presence of guidance (*DGUIDE*), the precision of guidance (*PRECGUIDE*), and the amount of guidance (*NUMGUIDE*), are constructed from First Call's Company Issued Guidance (CIG) database. Given that our study includes all the firms held, and not held, by activist hedge funds, it is not feasible to hand-collect guidance data for roughly 2,700 sample firms and an equivalent number of control firms. However, Chuk et al. (2012) document that the CIG database is far from complete, and it tends to miss coverage of smaller firms and firms with low analyst following and institutional ownership. As a result, one might expect a fair amount of measurement error in our dependent variables when it comes to these types of firms.

We note two aspects of our empirical design that alleviate some of this concern. First, as mentioned in Section 3.2 (measurement of the dependent variables), we only include firms in our

sample that are covered by First Call. This requirement prevents us from misclassifying a firm as a "non-guider" simply because it is not in the database. But we acknowledge that it is still possible for First Call to miss the guidance information of a covered firm in any given quarter. Second, one of our subsamples contains only firms that met or beat analysts' EPS estimates. Thus, in these tests, a firm must have analyst coverage and be included in the I/B/E/S database.

As another robustness check, we repeat our tests with the requirement that a firm must be covered by four or more analysts, which reduces our full sample by approximately 27%. The results from re-estimating equations (2) and (3) (not tabulated) are similar to those presented in Table 3, Panels A and B. Therefore, we believe any measurement error arising from the use of the First Call CIG database would not be enough to alter our results and inferences.

## 6. Conclusion

We examine a possible unintended consequence of activist hedge funds' investment in firms—a reduction in firms' voluntary disclosure. We find that firms are more likely to cease guidance or reduce the information in the guidance in the quarter subsequent to new investment by activist hedge funds. These results hold even for firms that met or exceeded analyst expectations for the quarter and have a history of consistently providing guidance in previous quarters. Since guidance has been shown to be beneficial to capital market participants in many ways, reduced guidance has meaningful market implications.

This study contributes to the literature on activist hedge funds, which has yet to examine how activist funds affect firms' governance reforms related to disclosure practices. We document one negative consequence to hedge fund activism, which provides some counterbalance to the numerous positive consequences documented in prior studies. Unlike prior

studies, we do not limit our focus solely to cases in which an activist files a Schedule 13D for a target firm. Therefore, our findings suggest that: 1) any other potential consequences are likely to be more subtle than previously examined, and 2) other corporate governance issues can be affected by activist hedge funds without a public hostile or non-hostile campaign against management.

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## Appendix: Variable Definitions

| Variable | Description | Source |
|---|---|---|
| $DGUIDE_t$ | Indicator variable set to 1 (0 otherwise) if the firm issued any type of management guidance. | First Call |
| $PRECGUIDE_t$ | Variable that measures precision of guidance (if issued), set to 4 for point estimates, 3 for range estimates, 2 for one-sided range, and 1 for qualitative estimates. | First Call |
| $NUMGUIDE_t$ | Variable that measures amount of guidance (if issued), defined as the number of guidance observations in the CIG database, regardless of the guidance type, horizon, nature, or timing. | First Call |
| $PIO\_AHF\_1STQ_t$ | Percentage of institutional ownership held by all activist hedge funds for a firm, conditional on the ownership being the first quarter of ownership for any activist-firm pair. | Thomson Reuters 13F |
| $PIO\_AHF\_EXISTING_t$ | Percentage of institutional ownership held by all activist hedge funds for a firm, conditional on the ownership *not* being the first quarter of ownership for any activist-firm pair. | Thomson Reuters 13F |
| $PIO\_NONAHF_t$ | Percentage of institutional ownership not held by activist hedge funds for a firm. | Thomson Reuters 13F |
| $Num.\ Analysts_t$ | The number of unique analysts who issued any EPS forecast for the firm during the quarter. | I/B/E/S |
| $Firm\ Size_t$ | Log of market value of equity (CSHOQ*PRCCQ) as of the end of the quarter. | Compustat quarterly |
| $ROA_t$ | Income before extraordinary items (IBQ) divided by total assets (ATQ) as of the end of the quarter. | Compustat quarterly |
| $Book\text{-}to\text{-}Market_t$ | Stockholders' equity (SEQQ) divided by market value of equity as of the end of the quarter. | Compustat quarterly |
| $Leverage_t$ | Sum of total long-term debt (DLTTC) and current debt (DLCQ) divided by market value of equity as of the end of the quarter. | Compustat quarterly |
| $Stock\ Return_t$ | Size-adjusted return (raw return - CRSP size decile return) for the quarter. | CRSP |
| $Stock\ Turnover_t$ | Average monthly share volume turnover (shares traded / shares outstanding) for the quarter. | CRSP |
| $Stock\ Volatility_t$ | Standard deviation of daily size-adjusted returns for the quarter. | CRSP |
| $Sales\ Growth_t$ | Growth in quarterly revenue from the prior year's quarter. | Compustat quarterly |
| $Cash\&STInvestments_t$ | Cash plus short-term investments scaled by total assets as of the end of the quarter. | Compustat quarterly |
| $Institutional\ Own_t$ | Total percentage of shares outstanding held by all institutional investors. | Thomson Reuters 13F |
| $AHFINVEST$ | Indicator variable set to 1 (0 otherwise) if a firm has experienced new ownership by activist hedge funds of at least 1% of shares outstanding | Thomson Reuters 13F |
| $SC13DA\_AHF$ | Indicator variable set to 1 (0 otherwise) for whether a Schedule 13D or 13D/A was filed by any activist hedge fund during the quarter | Edgar |

## Table 1: Sample Selection

Panel A: Sample firm-quarters by year and quarter

| Year/Quarter | Q1 | Q2 | Q3 | Q4 | Total |
|---|---|---|---|---|---|
| 1999 | 78 | 101 | 76 | 77 | 332 |
| 2000 | 86 | 78 | 85 | 82 | 331 |
| 2001 | 132 | 96 | 72 | 78 | 378 |
| 2002 | 136 | 110 | 70 | 142 | 458 |
| 2003 | 96 | 127 | 133 | 162 | 518 |
| 2004 | 170 | 122 | 115 | 337 | 744 |
| 2005 | 199 | 192 | 173 | 181 | 745 |
| 2006 | 180 | 181 | 131 | 174 | 666 |
| 2007 | 211 | 226 | 130 | 155 | 722 |
| 2008 | 129 | 136 | 71 | 62 | 398 |
| 2009 | 62 | 84 | 86 | 84 | 316 |
| 2010 | 82 | 82 | 67 | 77 | 308 |
| 2011 | 163 | 48 | -- | -- | 211 |
| Total | 1,724 | 1,583 | 1,209 | 1,611 | 6,127 |

Panel B: Logistic regression in which the dependent variable is an indicator of investment by activist hedge funds

| Variable | Coefficient |
|---|---|
| Firm Size$_{t-1}$ | −0.237 *** |
|  | (−14.09) |
| ROA$_{t-1}$ | 0.160 |
|  | (0.67) |
| Book-to-Market$_{t-1}$ | −0.106 ** |
|  | (−2.51) |
| Leverage$_{t-1}$ | 0.056 *** |
|  | (5.34) |
| Sales Growth$_{t-1}$ | 0.116 *** |
|  | (5.76) |
| Cash&STInvestments$_{t-1}$ | 0.347 *** |
|  | (4.48) |
| Stock Return$_{t-1}$ | −0.329 *** |
|  | (−4.92) |
| Institutional Own$_{t-1}$ | 1.208 *** |
|  | (15.27) |
| Num. Analysts$_{t-1}$ | 0.016 *** |
|  | (4.24) |
| Intercept | −2.540 *** |
|  | (−22.17) |
| Year Fixed Effects | Yes |
| N | 101,798 |
| Pseudo-$R^2$ | 0.029 |

## Table 1: Sample Selection (Continued)

Panel C: Covariate balance between sample and control firms

| AHFINVEST=1 (N=6,127) | | | AHFINVEST=0 (N=6,127) | | | Difference in Means | Difference in Medians | |
|---|---|---|---|---|---|---|---|---|
| Variable | Mean | Median | Variable | Mean | Median | | | |
| *Firm Size$_{t-1}$* | 6.52 | 6.46 | *Firm Size$_{t-1}$* | 6.54 | 6.55 | −0.02 | −0.09 | ** |
| *ROA$_{t-1}$* | 0.00 | 0.01 | *ROA$_{t-1}$* | 0.00 | 0.01 | 0.00 | 0.00 | * |
| *Book-to-Market$_{t-1}$* | 0.58 | 0.46 | *Book-to-Market$_{t-1}$* | 0.58 | 0.46 | 0.01 | 0.01 | |
| *Leverage$_{t-1}$* | 0.50 | 0.13 | *Leverage$_{t-1}$* | 0.52 | 0.14 | −0.02 | −0.01 | ** |
| *Sales Growth$_{t-1}$* | 0.21 | 0.10 | *Sales Growth$_{t-1}$* | 0.23 | 0.10 | −0.02 | 0.00 | |
| *Cash&STInvestments$_{t-1}$* | 0.21 | 0.12 | *Cash&STInvestments$_{t-1}$* | 0.21 | 0.12 | 0.00 | 0.00 | |
| *Stock Return$_{t-1}$* | -0.01 | -0.02 | *Stock Return$_{t-1}$* | -0.01 | -0.03 | 0.00 | 0.02 | *** |
| *Institutional Own$_{t-1}$* | 0.69 | 0.74 | *Institutional Own$_{t-1}$* | 0.69 | 0.74 | 0.00 | 0.00 | |
| *Num. Analysts$_{t-1}$* | 7.77 | 6.00 | *Num. Analysts$_{t-1}$* | 7.90 | 6.00 | −0.13 | 0.00 | *** |

Panel A shows our sample of firms in which new investment by activist hedge funds is at least 1% of a firm's shares outstanding for a given quarter.  Panel B shows the results of a logistic regression modeling the choice of activist hedge fund investment in firms.  Z-statistics are shown in parentheses.  Panel C compares the covariate balance between the sample firms and the propensity score-matched control firms.  All variable definitions are summarized in the appendix.  *, **, *** indicate significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test for means and a Wilcoxon signed ranked test for medians.

**Table 2: Descriptive Statistics**

Panel A: Distribution of variables measured in levels

| Variable | N | Mean | Minimum | 25th Pctl | 50th Pctl | 75th Pctl | Maximum |
|---|---|---|---|---|---|---|---|
| $DGUIDE_t$ | 12,254 | 0.47 | 0.00 | 0.00 | 0.00 | 1.00 | 1.00 |
| $PRECGUIDE_t$ | 5,713 | 3.12 | 1.00 | 3.00 | 3.00 | 3.00 | 4.00 |
| $NUMGUIDE_t$ | 5,713 | 1.77 | 1.00 | 1.00 | 1.00 | 2.00 | 5.00 |
| $PIO\_AHF\_1STQ_t$ | 12,254 | 0.01 | 0.00 | 0.00 | 0.01 | 0.02 | 0.05 |
| $PIO\_AHF\_EXISTING_t$ | 12,254 | 0.05 | 0.00 | 0.01 | 0.03 | 0.08 | 0.27 |
| $PIO\_NONAHF_t$ | 12,254 | 0.64 | 0.00 | 0.48 | 0.67 | 0.82 | 1.00 |
| $Num.\ Analysts_t$ | 12,254 | 7.94 | 1.00 | 3.00 | 6.00 | 11.00 | 31.00 |
| $Firm\ Size_t$ | 12,254 | 6.55 | 0.99 | 5.56 | 6.51 | 7.49 | 12.10 |
| $ROA_t$ | 12,254 | 0.00 | −2.07 | 0.00 | 0.01 | 0.02 | 0.14 |
| $Book\text{-}to\text{-}Market_t$ | 12,254 | 0.58 | 0.02 | 0.28 | 0.46 | 0.71 | 5.48 |
| $Leverage_t$ | 12,254 | 0.52 | 0.00 | 0.00 | 0.14 | 0.44 | 18.59 |
| $Stock\ Return_t$ | 12,254 | 0.02 | −0.65 | −0.13 | 0.00 | 0.14 | 0.88 |
| $Stock\ Turnover_t$ | 12,254 | 0.25 | 0.00 | 0.11 | 0.19 | 0.33 | 0.92 |
| $Stock\ Volatility_t$ | 12,254 | 0.03 | 0.01 | 0.02 | 0.03 | 0.04 | 0.16 |

Panel B: Distribution of variables measured in changes

| Variable | N | Mean | Minimum | 25th Pctl | 50th Pctl | 75th Pctl | Maximum |
|---|---|---|---|---|---|---|---|
| $\Delta DGUIDE_t$ | 12,254 | 0.00 | −1.00 | 0.00 | 0.00 | 0.00 | 1.00 |
| $\Delta PRECGUIDE_t$ | 11,089 | 0.33 | −3.00 | 0.00 | 0.00 | 0.00 | 4.00 |
| $\Delta NUMGUIDE_t$ | 11,089 | 0.17 | −3.00 | 0.00 | 0.00 | 0.00 | 3.00 |
| $\Delta PIO\_AHF\_1STQ_t$ | 12,254 | 0.01 | 0.00 | 0.00 | 0.01 | 0.02 | 0.05 |
| $\Delta PIO\_AHF\_EXISTING_t$ | 12,254 | 0.00 | −0.05 | 0.00 | 0.00 | 0.01 | 0.07 |
| $\Delta PIO\_NONAHF_t$ | 12,254 | 0.00 | −0.19 | −0.03 | 0.00 | 0.03 | 0.20 |
| $\Delta Num.\ Analysts_t$ | 12,254 | 0.10 | −5.00 | −1.00 | 0.00 | 1.00 | 5.00 |
| $\Delta Firm\ Size_t$ | 12,254 | 0.02 | −1.46 | −0.12 | 0.04 | 0.19 | 1.36 |
| $\Delta ROA_t$ | 12,254 | 0.00 | −0.90 | −0.01 | 0.00 | 0.01 | 0.88 |
| $\Delta Book\text{-}to\text{-}Market_t$ | 12,254 | 0.00 | −1.51 | −0.07 | 0.00 | 0.06 | 1.66 |
| $\Delta Leverage_t$ | 12,254 | 0.01 | −3.14 | −0.03 | 0.00 | 0.01 | 4.60 |
| $\Delta Stock\ Return_t$ | 12,254 | 0.03 | −1.03 | −0.17 | 0.02 | 0.22 | 1.07 |
| $\Delta Stock\ Turnover_t$ | 12,254 | 0.02 | −0.33 | −0.03 | 0.01 | 0.06 | 0.33 |
| $\Delta Stock\ Volatility_t$ | 12,254 | 0.00 | −0.06 | −0.01 | 0.00 | 0.01 | 0.06 |

**Table 2: Descriptive Statistics (Continued)**

Panel C: Counts of sample and control firms that changed or did not change guidance

| | Sample Firms | | Control Firms | |
|---|---|---|---|---|
| | Number | Percent | Number | Percent |
| Provided guidance then stopped | 678* | 25% | 477 | 18% |
| Provided guidance and continued | 747* | 28% | 914 | 34% |
| with (decreased / increased) precision | (100 / 67) | | (89 / 69) | |
| with (decreased / increased) amount | (279 / 124) | | (311 / 183) | |
| Did not provide guidance and did not start | 936 | 35% | 942 | 35% |
| Did not provide guidance then started | 328 | 12% | 360 | 13% |
| Total | 2,689 | | 2,693 | |

* The proportion of sample firms that stopped guidance or continued guidance is significantly different at the 1% level from the proportion of control firms in the respective categories based on a chi-squared ($\chi^2$) test.

Table 2 provides descriptive statistics of the variables used in our empirical tests. Panel A shows the distribution of the variables measured in levels, while Panel B shows them measured in changes (from quarter $t$-$1$ to quarter $t$). All variables are defined in the appendix. Panel C shows counts of sample and control firms that changed or did not change guidance.

## Table 3: Regression Analyses

Panel A: Next quarter's change in guidance regressed on current quarter's change in ownership by activist hedge funds

| | Full Sample | | | Consistent Guider and Met/Beat Expectations | | |
|---|---|---|---|---|---|---|
| | $\Delta DGUIDE_{t+1}$ | $\Delta PRECGUIDE_{t+1}$ | $\Delta NUMGUIDE_{t+1}$ | $\Delta DGUIDE_{t+1}$ | $\Delta PRECGUIDE_{t+1}$ | $\Delta NUMGUIDE_{t+1}$ |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\Delta PIO\_AHF\_1STQ_t$ | −4.820 *** | −4.774 *** | −3.234 *** | −10.829 *** | −7.000 *** | −3.840 ** |
| | (3.27) | (−3.11) | (−3.15) | (11.50) | (−3.93) | (−2.51) |
| $\Delta PIO\_AHF\_EXISTING_t$ | 0.663 | 0.610 | −0.207 | −0.505 | −0.835 | −0.501 |
| | (0.57) | (0.49) | (−0.24) | (0.03) | (−0.56) | (−0.42) |
| $\Delta PIO\_NONAHF_t$ | 1.375 *** | 1.261 *** | 0.593 ** | 2.547 *** | 1.353 *** | 0.670 * |
| | (3.60) | (3.16) | (2.25) | (10.03) | (3.00) | (1.74) |
| $\Delta Num\ Analysts_t$ | −0.026 * | −0.019 | −0.040 *** | 0.053 * | 0.031 * | −0.010 |
| | (1.74) | (−1.28) | (−3.92) | (3.35) | (1.95) | (−0.72) |
| $\Delta Firm\ Size_t$ | 0.424 *** | 0.441 *** | 0.349 *** | −0.577 ** | −0.283 * | −0.059 |
| | (3.46) | (2.99) | (3.86) | (4.13) | (−1.80) | (−0.41) |
| $\Delta ROA_t$ | 0.229 | −0.004 | −0.333 | −0.188 | 0.048 | −0.522 |
| | (0.49) | (−0.01) | (−0.95) | (0.02) | (0.06) | (−0.95) |
| $\Delta Book\text{-}to\text{-}Market_t$ | -0.135 | −0.061 | −0.056 | −0.926 ** | −0.409 * | −0.127 |
| | (1.02) | (−0.29) | (−0.44) | (4.52) | (−1.65) | (−0.72) |
| $\Delta Leverage_t$ | 0.126 ** | 0.112 | 0.113 ** | 0.376 ** | 0.210 ** | 0.006 |
| | (2.37) | (1.33) | (2.24) | (6.17) | (2.42) | (0.07) |
| $\Delta Stock\ Return_t$ | −0.265 *** | −0.282 *** | −0.162 *** | −0.260 | −0.107 | 0.062 |
| | (3.22) | (−2.91) | (−2.63) | (1.75) | (−1.03) | (0.68) |
| $\Delta Stock\ Turnover_t$ | −0.971 *** | −0.851 *** | −0.726 *** | −2.240 *** | −1.003 *** | −1.065 *** |
| | (3.89) | (−3.11) | (−3.98) | (16.46) | (−3.19) | (−4.20) |
| $\Delta Stock\ Volatility_t$ | −2.634 | −4.597 | −3.304 ** | −5.195 | −7.538 ** | −5.570 ** |
| | (1.25) | (−1.60) | (−1.99) | (0.84) | (−2.25) | (−2.06) |
| Intercept | N.M. | −0.230 | −0.050 | N.M. | −0.489 | −0.536 * |
| | | (−1.14) | (−0.47) | | (−0.72) | (−1.69) |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 12,254 | 6,759 | 6,759 | 3,284 | 3,142 | 3,142 |
| Pseudo-$R^2$ or Adj.-$R^2$ | 0.008 | 0.018 | 0.023 | 0.034 | 0.045 | 0.028 |

## Table 3: Regression Analyses (Continued)

Panel B: Last quarter's change in guidance regressed on current quarter's change in ownership by activist hedge funds

| | Full Sample | | | Consistent Guider and Met/Beat Expectations | | |
|---|---|---|---|---|---|---|
| | $\Delta DGUIDE_{t-1}$ | $\Delta PRECGUIDE_{t-1}$ | $\Delta NUMGUIDE_{t-1}$ | $\Delta DGUIDE_{t-1}$ | $\Delta PRECGUIDE_{t-1}$ | $\Delta NUMGUIDE_{t-1}$ |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $\Delta PIO\_AHF\_1STQ_t$ | 1.878 | 0.542 | 0.656 | 1.227 | −0.845 | −0.525 |
| | (1.23) | (0.36) | (0.66) | (0.13) | (−0.63) | (−0.39) |
| $\Delta PIO\_AHF\_EXISTING_t$ | 0.276 | 0.415 | 1.074 | 0.397 | 0.482 | 0.913 |
| | (0.23) | (0.35) | (1.31) | (0.02) | (0.44) | (0.86) |
| $\Delta PIO\_NONAHF_t$ | 0.594 | 0.454 | 0.344 | 0.701 | 0.152 | 0.717 ** |
| | (1.60) | (1.16) | (1.37) | (0.72) | (0.43) | (2.09) |
| $\Delta Num.\ Analysts_t$ | −0.006 | −0.007 | −0.013 | −0.087 ** | −0.029 ** | −0.037 *** |
| | (0.41) | (−0.46) | (−1.37) | (6.56) | (−2.08) | (−2.93) |
| $\Delta Firm\ Size_t$ | −0.112 | −0.085 | −0.005 | 0.728 ** | 0.275 ** | 0.230 * |
| | (0.91) | (−0.59) | (−0.05) | (5.44) | (2.02) | (1.70) |
| $\Delta ROA_t$ | −0.096 | −0.053 | −0.180 | −0.431 | 0.143 | 0.358 |
| | (0.23) | (−0.09) | (−0.52) | (0.23) | (0.30) | (0.86) |
| $\Delta Book\text{-}to\text{-}Market_t$ | 0.374 ** | 0.454 ** | 0.279 ** | 1.104 *** | 0.305 * | 0.393 * |
| | (2.44) | (2.42) | (2.45) | (11.15) | (1.70) | (1.95) |
| $\Delta Leverage_t$ | −0.090 | −0.107 | −0.057 | −0.302 * | −0.034 | 0.041 |
| | (1.55) | (−1.47) | (−1.28) | (3.62) | (−0.50) | (0.48) |
| $\Delta Stock\ Returns_t$ | 0.250 *** | 0.256 *** | 0.140 ** | −0.036 | −0.015 | 0.014 |
| | (2.86) | (2.62) | (2.28) | (0.02) | (−0.16) | (0.17) |
| $\Delta Stock\ Turnover_t$ | 0.175 | 0.387 | 0.080 | −0.690 | −0.236 | −0.175 |
| | (0.68) | (1.44) | (0.46) | (1.26) | (−0.95) | (−0.70) |
| $\Delta Stock\ Volatility_t$ | −6.393 *** | −8.142 *** | −6.910 *** | 2.432 | 0.675 | −4.321 * |
| | (3.05) | (−3.14) | (−4.53) | (0.16) | (0.28) | (−1.88) |
| Intercept | N.M. | 0.292 | 0.088 | N.M. | 0.261 | 0.653 * |
| | | (1.46) | (0.89) | | (0.45) | (1.87) |
| Year Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 12,254 | 6,770 | 6,770 | 3,284 | 3,271 | 3,271 |
| Pseudo-$R^2$ or Adj.-$R^2$ | 0.006 | 0.013 | 0.014 | 0.012 | 0.009 | 0.014 |

**Table 3: Regression Analyses (Continued)**

Table 3 presents results of lead-lag regressions in which the dependent variables are changes in guidance variables and the independent variables are new investment by activist hedge funds and control variables. Panel A shows next quarter's change in guidance regressed on current quarter's change in the explanatory variables. Panel B shows last quarter's change in guidance regressed on current quarter's change in the explanatory variables. Columns (1) through (3) show results for the full sample and columns (4) through (6) show results for the sample of firms that are consistent guiders and met or exceeded analyst estimates for the current quarter. Z-statistics are shown in parentheses for the conditional logit regressions in columns (1) and (4), while t-statistics are shown for the OLS regressions in columns (2), (3), (5), and (6). All variables are defined in the appendix. N.M. stands for not meaningful. *, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

## Table 4: Reduced-Sample Analyses

Panel A: Next quarter's change in guidance regressed on current quarter's change in ownership by activist funds

| | AHFs own 5% of More of the Firm | | |
|---|---|---|---|
| | $\Delta DGUIDE_{t+1}$ | $\Delta PRECGUIDE_{t+1}$ | $\Delta NUMGUIDE_{t+1}$ |
| | (1) | (2) | (3) |
| $\Delta PIO\_AHF\_1STQ_t$ | −4.396 ** | −3.762 * | −2.288 * |
| | (2.21) | (−1.87) | (−1.73) |
| $\Delta PIO\_AHF\_EXISTING_t$ | −0.550 | 0.420 | 0.482 |
| | (0.30) | (0.22) | (0.39) |
| $\Delta PIO\_NONAHF_t$ | 1.561 ** | 1.451 ** | 0.707 * |
| | (2.51) | (2.33) | (1.68) |
| $SC13DA\_AHF_t$ | 0.020 | −0.013 | −0.162 |
| | (0.12) | (−0.08) | (−1.39) |
| $\Delta Num\ Analysts_t$ | −0.014 | 0.000 | −0.018 |
| | (0.52) | (−0.01) | (−1.01) |
| $\Delta Firm\ Size_t$ | 0.264 | 0.304 | 0.200 |
| | (1.22) | (1.14) | (1.13) |
| $\Delta ROA_t$ | 0.832 | 0.764 | 0.655 |
| | (1.16) | (0.63) | (1.29) |
| $\Delta Book\text{-}to\text{-}Market_t$ | −0.465 ** | −0.464 | −0.257 |
| | (2.07) | (−1.19) | (−1.11) |
| $\Delta Leverage_t$ | 0.059 | 0.058 | 0.026 |
| | (0.68) | (0.41) | (0.34) |
| $\Delta Stock\ Return_t$ | −0.454 *** | −0.560 *** | −0.429 *** |
| | (3.19) | (−3.37) | (−3.81) |
| $\Delta Stock\ Turnover_t$ | −1.758 *** | −1.785 *** | −1.128 *** |
| | (4.29) | (−3.80) | (−3.81) |
| $\Delta Stock\ Volatility_t$ | −0.782 | −2.386 | −2.842 |
| | (0.22) | (−0.48) | (−1.01) |
| Intercept | N.M. | 0.840 ** | 0.572 *** |
| | | (1.99) | (2.78) |
| Year Fixed Effects | Yes | Yes | Yes |
| N | 4,074 | 2,167 | 2,167 |
| Pseudo-$R^2$ or Adj.-$R^2$ | 0.018 | 0.041 | 0.044 |

## Table 4: Reduced-Sample Analyses (Continued)

Panel B: Last quarter's change in guidance regressed on current quarter's change in ownership by activist funds

| | AHFs own 5% of More of the Firm | | |
|---|---|---|---|
| | $\Delta DGUIDE_{t-1}$ | $\Delta PRECGUIDE_{t-1}$ | $\Delta NUMGUIDE_{t-1}$ |
| | (1) | (2) | (3) |
| $\Delta PIO\_AHF\_1STQ_t$ | 0.643 | −0.842 | −0.770 |
| | (0.32) | (−0.42) | (−0.62) |
| $\Delta PIO\_AHF\_EXISTING_t$ | −2.210 | −1.909 | −0.160 |
| | (1.18) | (−1.10) | (−0.14) |
| $\Delta PIO\_NONAHF_t$ | −0.505 | −0.629 | −0.188 |
| | (0.80) | (−1.04) | (−0.47) |
| $SC13DA\_AHF_t$ | 0.122 | 0.102 | 0.119 |
| | (0.70) | (0.64) | (1.22) |
| $\Delta Num.\ Analysts_t$ | −0.031 | −0.022 | −0.015 |
| | (1.05) | (−0.88) | (−0.93) |
| $\Delta Firm\ Size_t$ | 0.234 | 0.216 | 0.113 |
| | (1.08) | (0.95) | (0.77) |
| $\Delta ROA_t$ | 0.540 | 1.205 * | 0.875 * |
| | (0.88) | (1.81) | (1.89) |
| $\Delta Book\text{-}to\text{-}Market_t$ | 0.044 | −0.071 | −0.104 |
| | (0.19) | (−0.29) | (−0.61) |
| $\Delta Leverage_t$ | 0.157 ** | 0.223 *** | 0.164 *** |
| | (2.14) | (2.75) | (2.73) |
| $\Delta Stock\ Returns_t$ | −0.049 | −0.018 | −0.024 |
| | (0.33) | (−0.12) | (−0.23) |
| $\Delta Stock\ Turnover_t$ | −0.215 | 0.021 | 0.067 |
| | (0.48) | (0.05) | (0.23) |
| $\Delta Stock\ Volatility_t$ | −6.342 * | −6.129 | −7.071 *** |
| | (1.73) | (−1.54) | (−2.91) |
| Intercept | N.M. | −0.579 | −0.190 |
| | | (−1.37) | (−0.81) |
| Year Fixed Effects | Yes | Yes | Yes |
| N | 4,074 | 2,247 | 2,247 |
| Pseudo-$R^2$ or Adj.-$R^2$ | 0.008 | 0.022 | 0.023 |

Table 4 presents results of lead-lag regressions in which the dependent variables are changes in guidance variables and the independent variables are new investment by activist hedge funds and control variables. The full sample is reduced to firm-quarters in which total activist investment in a firm is at least 5% and the explanatory variables include an indicator variable for whether a Schedule 13D or 13D/A was filed by any activist hedge fund during the quarter (*SC13DA_AHF*). Panel A shows next quarter's change in guidance regressed on current quarter's change in the explanatory variables. Panel B shows last quarter's change in guidance regressed on current quarter's change in the explanatory variables. Z-statistics are shown in parentheses for the conditional logit regressions in column (1), while t-statistics are shown for the OLS regressions in columns (2) and (3). All variables are defined in the appendix. N.M. stands for not meaningful. *, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

## Table 5: Long-term guidance patterns

| | Number of Firms | Quarter relative to new investment by activist hedge funds | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | t | t+1 | t+2 | t+3 | t+4 | t+5 |
| Percentage of firms that provided guidance (DGUIDE=1) after stopping in quarter t+1 | 678 | 100% | 0% | 29% | 33% | 30% | 29% |
| Mean precision of guidance (PRECGUIDE) for the firms that decreased precision starting in quarter t+1 | 100 | 3.9 | 2.8 | 3.1 | 3.2 | 3.1 | 3.1 |
| | | Number of firms left: | | 76 | 73 | 71 | 60 |
| Mean amount of guidance (NUMGUIDE) for the firms that decreased the amount starting in quarter t+1 | 279 | 3.0 | 1.5 | 2.0 | 2.0 | 2.2 | 1.8 |
| | | Number of firms left: | | 233 | 221 | 218 | 193 |

Table 5 shows the incidence, precision, and amount of guidance provided in quarters *t* through *t+5* by the three subset of sample firms that were identified in Panel C of Table 2—the 678 firms that stopped guidance in quarter *t+1*, the 100 firms that continued guidance but decreased precision in quarter *t+1*, and the 279 firms that continued guidance but decreased the amount of guidance in quarter *t+1*.