Informed Option Trading prior to a Corporate Announcement: When the Announcer Has Full Control

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Abstract

We study options trading prior to passive blockholders announcing their activist intentions. For these switchers, the choice of becoming an activist can come down to one subjective factor: the mind of the investor. Consequently, they have full control over when this private information becomes public. We document abnormal options trading 10 days prior to such announcements. During this period the switchers are legitimately allowed to take advantage of their material nonpublic information, which, as our evidence suggests, results in significant gains. We also find abnormal option trading prior to the ten-day period, evidence consistent with opportunistic trading.

Keywords: Insider Trading, Informed Trading, Options Markets, Blockholder, Schedule 13D/13G

JEL classification codes: G1, K2, D8

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1 Introduction

Corporate announcements gather the forever-going attention from scholars, practitioners, and the broader public, because the information they release to the public not only causes an immediate reaction in the market, but also benefits those already informed parties. In a hypothetical scenario, if the informed trader were 100% certain about the future price of the stock, then he would pursuit as high leverage as he could afford. The option market provides a readily available menu of leverage as suggested by Black (1975). There is thus a growing literature studying the informed option trading activities before corporate announcements, such as takeover announcements (Cao, Chen, and Griffin 2005; Augustin, Brenner, and Subrahmanyam, 2019), earnings announcements (Patell and Wofson 1979, 1981; Jin, Livant, and Zhang, 2012), and macroeconomic news (Poteshman, 2006). However, the causal link between the abnormal option trading activities prior to corporate announcements and the existence of informed trader has been clouded by the unknown identity of the informed trader. Thus, the question of whether informed investors use options is still a matter of debate.

This paper contributes to the above literature by studying option activities prior to a special sample of announcements in which the informed trader can be identified with a great degree of certainty. Specifically, we construct a sample of announcements of passive blockholders becoming active (we refer to these blockholders as "switchers"). Unlike other corporate announcements involving multiple parties, the switchers have full control over the timing of their announcements, to which the market reacts positively on average (Brav et al., 2008; Klein and Zur, 2009).[1] This discretionary power of the switchers to choose the timing of the announcement renders it difficult to rule out the probability that they participate in the informed trading.

Active blockholders are well-known to the public for their use of options. However, their incentive can be more than informed trading – many of them use options to build up ownership positions quietly before noticed by the target firm and the market.[2] This strategic collection of voting rights

[1] In Appendix B we show that in our data the jump is around 1%.

[2] One example is the acquirement of Allergan stock by Pershing Square Capital Management (Bill Ackman). In the total 9.5% ownership of Allergan by Persing, 85% of it is gained through call options expired prior to the public announcement of the 13D.

via option is named as the "surprise attack" by the investment relation professionals.[3] By focusing on the switcher group, we are able to rule out those active blockholders whose main incentive is to collect voting rights, since they already collected enough equity stake as a passive blockholder. Consistent with this conjecture, the average ownership in our sample prior to and after the switch are 14.31% and 15.67% respectively, and the difference of 1.36% is marginally significant (t-statistic = 1.67).

There are several reasons of why selecting a sample of switchers enable us to build a direct link between abnormal option trading activities and the switchers themselves. First, the switcher has full control of when to make the announcement. Unlike other corporate events which are decided by several parties, the timing of the switch is decided by the single party, the switcher. Second, the pecuniary cost of switch can be as low as zero, since the minimum ownership is the same (5%) for both Schedule 13G filing and Schedule 13D filing. In other words, the switcher doesn't have to increase her current position in equities. The choice of switching from 13G to 13D can thus "come down to one highly subjective factor: the self-professed passivity of the investor" (Giglia, 2016). Third, the number of informed participants involved in a switch is much smaller than other corporate events, such as a takeover. Whereas in a switch the private information is confined within a tiny group, in an takeover the information can be obtained through multiple channels, including the bidder, the target firm, and the intermediate agencies.

In this paper, we investigate whether the switchers take advantage of their private information in the options markets. We employ an event-study framework testing abnormal option trading activities before switch announcements. Since switchers have 10 calendar days to announce their activist intentions[4], we examine two testing windows: [-10, -1] and [-30, -11]. Option trading in the

[3] More insights and discussions can be seen in the article "Surprise attack: activist investors use options trading to avoid detection" from "www.irmagazine.com".

[4] On acquiring a 5% stake in a public firm, a shareholder must file a Schedule 13 with the Securities and Exchange Commission (SEC). The Schedule 13D or 13G reporting person's beneficial ownership does not change when that person sells the subject securities short, pledges the securities in a secured transaction or the writing of call options. See `https://www.sec.gov/divisions/corpfin/guidance/reg13d-interp.htm`. The reason for this requirement is to make stakeholders aware of a possible change of control. Investors taking a beneficial ownership interest in a subject company must report the details of their holdings on either Schedule 13D or Schedule 13G. If the filer intends to influence the control of the subject company, a Schedule 13D must be filed; if this blockholder instead intends to remain passive, a Schedule 13G must be filed, which is shorter and comes with fewer disclosure requirements that Schedule 13D.

[-10, -1] window is legally allowed and reflects extra pecuniary interest beyond the existing beneficial interest from holding shares of stock in the subject company.[5] Any options trading during the [-30,-11] window suggests that switchers, after presumably deciding to engage in activism, may not be filing Schedule 13D on time and thus opportunistically try to exploit their informational advantage over a longer period of time.[6] This is also evidence of potential violation of security laws.

Using data from SEC EDGAR and OptionMetrics for the period from 1994 to 2017, we document abnormal trading activities in options in both of the [-10, -1] and [-30, -11] windows. We show that these results are stronger for options expiring right after the switch announcement events. These results are robust to different regression specifications, the inclusion of a broad range of control variables, several abnormal volume measures, subsample and subperiods tests. We also control for confounding events such as M&A announcements. Finally, we show that the switchers can earn significant profit from options trading during both tested windows. A naive trading strategy that on day $t = -30$ buys out-of-the-money (OTM) call options and closes all positions on day 0 earns a return of 67.5%. A similar naive trading strategy starting on day $t = -10$ earns a return of 107.1%[7]

Our paper relates to several strands of literature. First, our paper strengthens the existing literature that studies options trading prior to corporate events such as M&A announcements (Cao, Chen, and Griffin, 2005; Augustin, Brenner, and Subrahmanyam, 2019) or earnings announcements (Jennings and Starks, 1986; Roll, Schwartz, and Subrahmanyam, 2010; Truong and Corrado, 2014). In contrast to corporate announcements that are pre-scheduled and the informed traders aren't likely to have full control over whether or when the announcement is made, our switchers have full control of whether and when to announce their switches. For the uninformed traders in the

[5] Activists argue that they make "extra money" as compensation for and to cover costs such as research performed or efforts taken to discipline the managers of the subject company.

[6] With the untimely filing of Schedule 13D which violates Rule 13d-1(e)(1), switchers may extracts additional benefits. We explore this possibility by looking at options activity in the [-30, -11] period. Notably, on September 10, 2014, the SEC announced charges against 28 officers, directors and significant shareholders for federal securities law violations stemming from their failure to timely file Schedule 13 with the SEC.See https://www.sec.gov/news/press-release/2014-190. For example, Mount Kellett Capital Management LP incurred an obligation to file a Schedule 13D by the end of October 2014; however, it failed to file a Schedule 13D until December 2014 – more than a month after it incurred a legal filing obligation.For more details see `https://www.sec.gov/litigation/admin/2018/34-83637.pdf`.

[7] On the flip side however opponents argue the ten-day-window should be shorter as this compensation is unwarranted (Giglia, 2016).

market the switch announcement can be considered almost as a random event, since there is far less information about the blockholder compared to the public firms. While in a corporate announcement the insider trading is illegal, informed trading during days [-10, -1] prior to the switch announcement is allowed by law.

Second, our work also contributes to the literature on whether informed traders choose to trade on options or equity markets (Easley, O'Hara, and Srinivas, 1998; Pan and Poteshman, 2006; Chakaravarty, Gulen, and Mayhew, 2004; Conrad, Dittmar, and Ghysels, 2013; An et al., 2014). Collin-Dufresne, Fos, and Muravyev (2020) studies voluntarily reported option trading in 13D filings in relation to stock price volatility. Beneficial owners have to report in Item 6 under Section 13(d) when they acquire an amount of an equity security that, when added to any existing holdings, will exceed 5% of a class of equity covered by the statute and rule. However, a cash-settled option is not an equity security issued by the subject firm. As such, acquisition of an amount of options settled exclusively in cash can never be considered an acquisition of an equity security under the regulatory framework. The holder of the option has no rights with respect to any matters of the issuer, and does not even have standing to sue the issuer. If a filer elects to include disclosure of its use of cash-settled options, its inclusion would be completely voluntary. We focus on all option trading related to the switch in the market and provide evidence that switchers utilize options market as well as equity market to capitalize on their private information. Our paper provides a unique opportunity to understand the connections between option and equity market via a special case where the informed investor has a full control on when the private information becomes public.

Third, our paper adds to the growing activist literature by providing one of the possible reasons for why some passive blockholders switch to become active (Appel, Gormley, and Kleim, 2019; Bebchuk, Brav, Jiang, and Keusch, 2020). Whether or not an activist has a long term plan for the firm, the ability to reap pecuniary benefits from the option market can be one of the motivations under her consideration.

Finally, our paper also has important policy implications. Our results show that the switchers earn abnormally high return from the significant market reaction to their public announcement through option trading. Our results suggest that the switchers take advantage of their private information before day $t = -10$. This evidence implies that such insider trading may undermine the transparency of the market which the Schedule 13 disclosure is supposed to enhance. One way to mitigate the issue is to enforce a mandatory and timely report on the related option trading activity prior to the filing of Form 13D. This report would likely enhance the transparency of the market and encourage filers to file Schedule 13D in a timely manner.[8]

2 Data and methodology

2.1 Data sources and sample selection

We use three data sources to construct our sample – EDGAR, OptionMetrics, and Compustat. A switch event is defined as the announcement of a 13D filing by a filer who had previously filed a 13G filing on the exact same firm (the subject firm). We first collect all such switch events from EDGAR for the period from 1994 to 2017 and report their frequency in Table 1, Panel A. There are a total number of 4,208 switch events. Columns (1), (2), and (3) in Panel A of Table 1 show the number of switch events, the number of subject firms, and the number of filers who switched from Schedule 13G to 13D in a particular year, respectively. For example, in 2017 there are 180 cases in which an investor files a 13D form on a subject company who had previously filed a 13G form on that same subject firm (Column 1). These 180 events in year 2017 are associated with 170 unique subject firms and 143 unique filers. Panel A of Table 1 shows that the switch events are distributed uniformly across the years with the exception of the first couple of years of the sample.

Second, we merge the data collected from EDGAR with equity option data from OptionMetrics. To merge these two datasets we use SEC Analytics Suite via the linkage between CIK and CUSIP for the subject firms. OptionMetrics covers data available after 1997. Because we study whether there is abnormal option volume before the switch events, we collect option data for the subject firms for 140 days before an event, i.e., for the period [-140, 0]. Our final sample comprises 795

[8]The "Brokaw Act" was introduced to the Senate in 2016 but there was no development. See `https://www.congress.gov/bill/114th-congress/senate-bill/2720?s=1&r=79`. The bill directed SEC to enhance transparency and protect companies by shortening the 13D filing period, require more disclosure of derivatives, and expanding the definitions of "beneficial ownership" and "person," and require more disclosure of derivatives.

event–subject pairs over the period 1997-2017 period (Column (4), Table 1, Panel B). Our final sample is uniformly distributed across years. Also, looking across Panel A and Panel B of Table 1 our final sample of switch events (Panel B of Table 1) is representative of the switch events we collect from EDGAR (Panel A of 1).

Third, we collect accounting and financial data from Compustat for the subject firms which we use in our multivariate regression analysis.

2.2 Methodology

2.2.1 Univariate tests

To test whether there is abnormal option trading activity prior to the switch announcement events we define the period from day -140 to -41 prior to the switch date as the benchmark (control) period and the period from day -30 to -1 prior to the switch date as the treatment period. We study whether there is abnormal option trading during [-30, -1] period as well as during two subperiods [-10, -1] and [-30, -11]. We explore whether there are abnormal option trading activities during these two subperiods because the switchers (the blockholders who switches from 13G to 13D) have up to 10 days to announce that their intentions change from passive to active and file form 13D. The switchers can legally trade on their information during [-10, -1] period. Abnormal option trading during [-30, -11] period is consistent with misuse of information in the following sense – switchers (or related parties) claim to be passive while having activists' intentions. The switcher or any other related party are not supposed to trade on this information before the day the switcher alleges to make this switch decision, especially not before the earliest possible day she is allowed to be considered to make the decision, day $t = -10$. Admittedly, we cannot identify the exact identities of the informed traders; however, the fact that only the switcher is supposed to know her own intention renders her highly likely to be the informed trader.

Mean-adjusted average abnormal option trading volume To construct a measure for abnormal option trading activities for the subject firm for each event, we first define $V_{i,t}$ as the number of traded option contracts on the subject firm during switch event i on day t. One contract corresponds to 100 shares in the underlying stock. Next, we define $AV_{i,t}$, the daily abnormal trading volume for each event i on day t during the treatment period as:

$$AV_{i,t} = V_{i,t} - \tilde{V_i} \quad (t \in [-30, -1]) \tag{1}$$

where $\tilde{V_i}$ is the average daily trading volume of $V_{i,t}$ during the control period [-141, -41]:

$$\tilde{V_i} = \frac{1}{100} \sum_{t=-141}^{-41} V_{i,t}.$$

The average daily abnormal trading volume for each event i is:

$$AAV30_i = \frac{1}{30} \sum_{t=-30}^{-1} AV_{i,t}, \text{when the treatment period is [-30,-1]} \tag{2}$$

$$AAV10_i = \frac{1}{10} \sum_{t=-10}^{-1} AV_{i,t}, \text{when the treatment period is [-10,-1]} \tag{3}$$

$$AAV20_i = \frac{1}{20} \sum_{t=-20}^{-1} AV_{i,t}, \text{when the treatment period is [-30,-11].} \tag{4}$$

We then test if AAV_i's are statistically different from zero. If the average abnormal trading volume is statistically different from zero the evidence is consistent with our alternative hypothesis that there is abnormal trading activities prior to the switch.

Abnormal trading volume based on a market model Another approach to estimating the abnormal trading volume is via a market model for volume (Ajinkya and Jain, 1989; Cready and Ramanan, 1991; Campbell and Wasley, 1996; Chae, 2005; Augustin, Brenner, and Subrahmanyam, 2019). To investigate the robustness across methods, we also use the market model for volume (MMV) with different numbers of factors. Our major method follows Augustin, Brenner, and Subrahmanyam (2019), by constructing a four-factor model:

$$V_{i,t} = \alpha_i + \beta_{1,i} * V_{MKT,t} + \beta_{2,i} * VIX_t + \beta_{3,i} * R_{MKT,t} + \beta_{4,i} * R_{i,t} + \epsilon_{i,t} \tag{5}$$

where $V_{i,t}$ is the daily option trading volume for option i in day t; $V_{MKT,t}$ is the market option volume, measured by the median trading volume across all options in the OptionMetrics database in day t; VIX_t is the the Chicago Board of Options Exchange (CBOE) Volatility Index in day t; $R_{MKT,t}$ is the market stock return, proxied by the S&P 500 index in day t; $R_{i,t}$ is the underlying stock return for option i in day t. We also control for lagged dependent and all independent variables. The abnormal volume $AV_{i,t}$ of MMV corresponding to Equation 1 of the Mean-Adjusted method is thus:

$$AV_{i,t} = \hat{\alpha}_i + \hat{\beta}_{1,i} * V_{MKT,t} + \hat{\beta}_{2,i} * VIX_t + \hat{\beta}_{3,i} * R_{MKT,t} + \hat{\beta}_{4,i} * R_{i,t} \tag{6}$$

2.2.2 Multivariate tests

We employ a multivariate regression analysis to control for variations in firm and security characteristics. We use the following regression equation to test for abnormal option trading volume during the treatment period:

$$ln(V_{i,t}) = \alpha + \beta * D_{i,t} + Controls + \epsilon_{i,t}, \tag{7}$$

where $ln(V_{i,t})$ is the natural logarithm of the option trading volume for the subject firm for event i on day t. $D_{i,t}$ equals one if day t is in the treatment period, and zero if it is in the control period [-140,-31]. Because we have three separate treatment periods, [-30, -1], [-10, -1], and [-30, -11], D is one of the following variables: *D_30*, *D_10*, and *D_20*. If the coefficient associated with *D_30*, *D_10*, and *D_20* is statistically different from zero, the option volume in the [-30, -1], [-10,0], and [-30, -11] is different from the controlled period. *Controls* is a list of variables that can influence options volume. Specifically, we include firm's market value (*ln(Size)*) and book-to-market equity (*ln(BM)*) as of the most recent calendar year end; daily stock trading volume (*ln(Stock volume)*) and daily stock return (*Return*); as well as the stock return volatility (*Volatility*) and skewness (*Skewness*) estimated over [-140, -1] period. All variables are explained in Appendix A. In Eq. 7 we also include year fixed effects and the standard errors are clustered at the event level.

2.3 Variables and summary statistics

In Eq.1 and Eq.7, $V_{i,t}$ corresponds to the number of traded call (C) or put option (P) contracts. Prior studies show that option moneyness is an important characteristic. For example, Augustin et al. (2019) show that 25% of all takeovers have positive abnormal volumes, which are greater for short-dated out-of-the-money calls. Thus, we further stratify the sample considering the moneyness of the call and put options out-of-the-money (OTM), in-the-money (ITM), and at-the-money (ATM). For example, $\text{C\_otm}_{i,t}$ denotes the aggregated out-of-the-money call option volume for a firm i in a day t. All variables are described in Appendix A. We define a call option to be OTM if the natural log of the ratio between daily closing price and option strike price is less than -0.01. Similarly, a call option is ITM if the natural log of this ratio is greater than 0.01; and a call option is ATM if this natural log value is between -0.01 and 0.01.

If an informed trader knows the exact announcement date of the switch event, during which the stock price is likely to jump, then she will not purchase options which expire before that day. Therefore, options expiring after the *ex-post* known switch day are more likely to be traded by informed traders, and could serve as an less confounded measure of informed trading. Furthermore, the closer an option is to its expiration date, the lower the price is, due to the nonlinear speed of depreciation of embedded time value of options as it approaches expiration. Hence, the informed trader will be likely to target options which expire as soon after the switch day as possible. Thus, we also stratify the sample by the option expiration. Specifically, we look at options that expire after the switch event as well as options that expire within five days after the event. For example, *C_otm_exp* and *C_otm_exp5* denote the aggregated out-of-the-money call option volume of a firm in a day expiring after the event and expiring between event days [0, 5], respectively. All variables are explained in Appendix A.

Table 2 reports summary statistics. Panel A reports the mean, median, and standard deviation of the average daily option volume across the 795 switch events for the treatment period [-30, -1] and the control period [-140, -41]. Panel A of Table 2 shows that the there is more option volume in the treatment period [-30, -1] than in the control period [-140, -41]. For example, in the benchmark period the mean of the daily option call contracts (C) is 882.133 while in the treatment period the mean of C is 1262.849 contracts. The difference is statistically significant. For the OTM calls (C_otm), means are 560.979 during the control period and 792.708 during the treatment period. We observe a similar trend for the OTM calls expiring after the announcement (C_otm_exp) and for the calls expiring within five days after the event (C_otm_exp5). These summary statistics are consistent with the notion that there is an abnormal trading activity in options prior to a switch event.

Panel B of Table 2 reports summary statistics for the control variables we use in our multivariate regression analysis. These variables are defined in Appendix A. In this section, we examine the abnormal option trading activities prior to the announcements of the 13G-to-D switch. In particular, we compare the difference of option trading volume between the 30-day the treatment period ([-30,-1]) and the control period ([-140, -41]) using various methodologies and subsamples.

We begin by analysing the average daily abnormal trading volume (AAV) under an event-study univariate framework. We then control for additional determinants of returns by employing a regression analysis. We also control for several filer and subject characteristics by using subsample tests.

2.4 Main results

In this section we employ univariate event study methodology to study informed trading activities prior to the switch by comparing option trading volumes between treatment and control period, assuming homogeneity across events and *ceteris paribus* for all firm fundamentals during these two periods. Table 3 reports the means and the t-statistics for *AAV30* (Eq.2), *AAV10* (Eq.3), and *AAV20* (Eq.4). *AAV30*, *AAV10*, and *AAV20* is the average mean-adjusted abnormal option trading volume when the treatment period is [-30,-1], [-10,-1], and [-30,-11].[9]

[9]There are three important sample characteristics to consider when one performs a t-test – normality, skewness, and kurtosis. Along these three dimensions, the reported results are very conservative as they are based on raw volume. First, raw volume is non-normal, however arguably among moderate and large samples a violation of normality still yields accurate p-values. Second, the distribution of raw volume is skewed and fat-tailed which reduces the power of the test considerably. We re-do the results reported in Table 3 and 4 after we log transform the *AAV30*, *AAV10*, and *AAV20* measures and then perform the t-test. The results are stronger than those currently reported in Table 3 and 4.

We first focus our discussion on *AAV30* which measures the abnormal option trading volume during the [-30,-1] treatment period relative to the control period [-140, -41]. All t-statistics are greater than 2 with the exception of the t-statistics associated with C_itm which is 1.64. This evidence shows that there is abnormal option trading volume for all but one of the option volume variables.

Table 3 also shows that there is abnormal volume in the two treatment subperiods : [-30, -11] and [-10, -1], especially for options expiring after the announcements and those that expire within five days after the event. The options that expire after the announcements are more likely to capture informed trading activity by the blockholders. The significant abnormal option trading activity during [-10, -1] period captures additional pecuniary benefits that the blockholders earn beyond their beneficial ownership interest in the subject company. The abnormal option trading activity during [-30, -11] is consistent with the possibility that the blockholders misuse their informational advantage – claiming to be passive while having activists intentions.

The inferences from Table 3 are robust to measuring the abnormal volume based on the four-factor volume market model (Eq.5 and Eq.6). We report these results in Table 4. The results are very similar to the results reported in Table 3 when we estimate the abnormal volume based on mean-adjustment.

To assess the economic significance of the pecuniary benefits that the switchers earn from option trading beyond their benefits from equity ownership, we look at simple feasible trading strategies. Appendix C provides a list of possible strategies that the switcher can pursue. Here we consider the profitability of buying a call option before an event, hold until the event, and sell on the announcement day and simultaneously sell a put option before an event and buy on the announcement day. First, we look at a strategy which on day -30 buys the available OTM call options and shorts ITM put options and closes these positions on day 0. This strategy earns 27.32% return across all events in our sample (t-statistics is 9.30). If the strategy considers only buying the OTM calls, the return is 67.5%. Second, we look at a strategy which on day -10 buys the available OTM call options and shorts ITM put option and closes all these positions on day 0. This strategy earns an average return of 28.47% (t-statistics is 10.47). If the strategy considers only buying the OTM calls, the return is 107.1%.

2.5 Multivariate results

In the previous section, we assume *ceteris paribus* of firm and option fundamentals both time-wise and firm-wise. However, time-series and cross-sectional variations of firm and security characteristics can caused selection bias on observables. Previous literature shows that option trading activities can be predicted by multiple such characteristics. For example, Cao and Han (2013) document a significant negative relation between a delta-hedged option return and underlying stock idiosyncratic volatility; An, Ang, Bali, and Cakici (2014) show that past stock return predicts option implied volatility. Therefore, we apply a regression analysis to examine if the abnormal option trading activity is robust to these characteristics.

Table 5 reports the option volume regression results as per Eq.7 for 20 different dependent variables. To save space, the table reports the coefficient associated with variables of interest only, i.e., *D_30*, *D_20*, and *D_10*. The following control variables are included in all regression specifications: *ln(Size)*, *ln(BM)*, *ln(Stock volume)*, *Return*, *Volatility*, and *Skewness*. Detailed variable definitions are provided in Appendix A.

Panel A of Table 5 presents the regression results when the treatment period is [-30,-1]. The coefficient associated with *D_30* is positive and significant in all cases where the dependent variable is volume of options that expire after the event, i.e., for all dependent variables that have extension *_exp* or *_exp5*. For example, the coefficient on *D_30* when the dependent variable is *ln(C_otm_exp)* and *ln(C_otm_exp5)* is 0.808 (t-statistics = 17.29) and 0.685 (t-statistics = 5.78).

Panel B and C of Table 5 report the regression results for the two treatment subperiods: [-10,-1] and [-30,-11]. Notably, the results follow similar trend as the one in Panel A. Specifically, the coefficient associated with *D_10* (Panel B) and *D_20* (Panel C) is positive and significant in all regression specification where the dependent variable is volume of options expiring after the announcement. For example, the coefficient associated with *D_10* is positive and significant when the dependent variable is *ln(C_otm_exp)* and *ln(C_otm_exp5)* is 0.913 (t-statistics = 15.71) and 0.686 (t-statistics = 4.38). Similarly, the coefficient associated with *D_20* is positive and significant when the dependent variable is *ln(C_otm_exp)* and *ln(C_otm_exp5)* is 0.749 (t-statistics = 15.76) and 0.663 (t-statistics = 4.94).

With regards to the control variables, the coefficients associated with *ln(Size)*, *Return*, and *ln(Stock volume)* are generally positive and significant, while the coefficients on *ln(BM)*, *Volatility*, and *Skewness* are generally negative and significant. These results are available upon request.

Overall, we find that, after controlling for firm and security characteristics, there is an abnormal option trading volume during [-30,-1] as well as the two suboeriods, [-10,-1] and [-30,-11], especially for options expiring after the event. These results show that the blockholders use option to earn extra pecuniary benefits beyond their direct ownership in the subject company. Moreover, the fact that we document abnormal option volume in the [-30,-11] subperiod suggests that the blockholders probably abuse their informational advantage and claim passivity while having activists' intentions.

2.6 Subsample evidence

In this section, we explore whether our results are robust to different characteristics of the filers and the subjects.

2.6.1 Repeated filers

We explore whether our results are driven by filers who are passive blockholders and announce activists' intentions for more than one subject company. From all 795 switch events (Table 1) 455 are announcements by filers who over our sample period switch from Schedule 13G to Schedule 13D more than once. We refer to these blockholders as repeat filers. Table D.1 in Appendix D shows the distribution of the repeat filers subsample. There are a total of 2,003 switch events in EDGAR associated with repeat switchers. Merging these events with OptionsMetrics leaves us with 455 switch events by repeat switchers.

To test whether our results are driven by repeat switchers, we replicate Table 5 but now separate for two subsamples: repeat switchers and non-repeat switchers. The regression results are reported in Table 6. Because Table 5 shows that our results are driven by options expiring after the announcements, to save space in Table 6 we report regression results only for the folling six dependent variables: *ln(C_otm_exp)*, *ln(C_atm_exp)*, *ln(C_itm_exp)*, *ln(P_otm_exp)*, *ln(P_atm_exp)*, and *ln(P_itm_exp)*. To save space, we also report the coefficients associated only with *D_30*, *D_20*, and *D_10* variables. The coefficients associated with *D_30*, *D_20*, and *D_10* are positive and significant in both subsamples: repeat filers and non-repeat filers and for all treatment periods (Panel A, B, and C). There is no difference between repeat and non-repeat filers in terms of abnormal volume (unreported in the table). Thus, our main results are robust to this subsample test.

2.6.2 Multiple filers

Next, we explore whether our results are driven by events where the subject firm experienced more than one switch during our sample period. We refer to these events as multiple filers events. From all 795 switch events (see Table 1), 327 announcements are such events. Table D.2 in Appendix D shows the distribution of the multiple filers subsample. There are a total of 1,826 switch events in EDGAR associated with multiple switchers. Merging these events with OptionsMetrics leaves us with 327 switch events by multiple switchers.

To test whether our results are driven by multiple switchers announcements, we report results for two subsamples: multiple switchers and nonmulitple switchers in Table 6. The coefficients associated with *D_30*, *D_20*, and *D_10* are positive and significant in both subsamples: multiple filers and nonmultiple filers events and for all treatment periods (Panel A, B, and C). There is no difference between multiple and nonmultiple filers events in terms of abnormal volume (unreported in the table). Thus, our main results are robust to this subsample test.

2.6.3 Institutional filers

We also explore whether our results are driven by filers who are institutions. We define institutional filers as those who have filed 13F. From all 795 switch events (see Table 1), 410 are announcements made by institutional blockholders. Table D.3 in Appendix D shows the distribution of these announcement. There are a total of 1,453 switch events in EDGAR associated with institutional switchers. Merging these events with OptionsMetrics leaves us with 410 switch events by blokholders who are institutions.

In Table 6 we report results for two subsamples: institutional switchers and noninstitutional filers. The coefficients associated with *D_30*, *D_20*, and *D_10* are positive and significant in both subsamples: institutional filers and noninstitutional filers for all treatment periods (Panel A, B, and C). There is no difference between institutional filers and noninstitutional filers in terms of abnormal volume (unreported in the table). Thus, our main results are robust to this subsample test.

3 Additional Analysis and Robustness

3.1 Abnormal stock trading volume

When it comes to the question of where (option or stock markets) the informed traders choose to first capitalize their information, the answer still remains a matter of debate. On one hand, studies show that option markets lead equity markets and that informed traders prefer options (Manaster and Rendleman, 1982; Anthony, 1988; Easley et al, 1998; Ni, Pan, and Poteshman, 2008; Kumar, 2008; Chakravarty et al 2004; Chan et al 2010). On the other hand, some papers show conflicting or inconclusive results (Bhattacharya, 1987; Stephen and Whaley, 1990; Chan et al 1993) as well as option trading activity being not informative (Stephen and Whaley 1990, Chan et al 2002). Finally, Chakravarty, Gulen, and Mayhew (2004) show evidence that informed investors trade in both stock and option markets. Thus, whether there is abnormal trading in equities prior to the announcements of activists' intentions requires further empirical explorations. [10]

Our main motivation for exploring option trading before the announcements is due to the fact that option markets are a venue where informed traders can exploit their informational advantage

[10] When a Schedule 13D or 13G reporting person sells the subject securities short, such short sales normally will not change a reporting person's Rule 13d-3 beneficial ownership since such sales do not change the amount of shares over which the person has "voting or investment power". (See: https://www.sec.gov/divisions/corpfin/guidance/reg13d-interp.htm)

due to the leverage and the built-in downside protection (Black, 1975). Empirical studies have documented informed options trading around takeover announcements. Cao, Chen, and Griffin (2005) find call-volume imbalances predicts next-day stock returns prior to an M&A announcement. More recently, Augustin, Brenner, and Subrahmanyam (2019) document pervasive informed option trading activity for the target firm before the takeover announcement.

Another reason to focus on option trading versus stock trading is that the switchers (passive blockholders) already have a sizable share in the underlying stock. Therefore, they are not as compelled to trade equities as the new blockholders who have to collect equity to pass the 10% threshold when filing Schedule 13D. If they have an informational advantage, trading in option markets gives them much more pecuniary benefits than what they obtain from the stock ownership. While it is in the interest of switchers to trade in the options markets, at the same time they do not want to exert extreme demand pressures on the options of the subject firm. Extreme demand pressures can increase the price of the options and thus reduce the profits for the blockholder (Gârleanu, Pedersen, and Poteshman, 2009). The switchers would use various strategies to camouflage their private information so that it is difficult to distinguish them from liquidity motivated traders (Kyle, 1985; Admati and Pfleiderer, 1988).

Although our hypothesis that informed traders capitalize their information in the option market stands on its own regardless whether they trade in the equity market, it is still interesting to examine their behavior in the equity markets. To test whether there is abnormal stock trading prior to the announcement we follow the regression model in Eq.7, however now the dependent variable is *ln(Stock volume)*. The following control variables are included in the regression specification: *ln(Size)*, *ln(BM)*, *Return*, *Volatility*, and *Skewness*. We include year fixed effects and the robust standard errors are clustered by event. Table 7 report the results for the full sample as well as six subsamples: repeat and non-repeat filers, multiple and nonmultiple filers; and institutions and all other filers. The coefficients associated with *D_30*, *D_20*, and *D_10* are positive and significant in the full sample as well as in all subsamples. These results are consistent with informed trading activities both in options and stock markets prior to the switch announcements.

In terms of economic significance we first look at a strategy which on day -30 buys the even-weighted portfolio of the stock of the subject firms and closes the position on day 0. This naive strategy does not earn significant profits (t-statistics = -0.68). Second, we look at a strategy which on day -10 buys the stock and closes the position on day 0. This strategy earns an average return of 2.79% (t-statistics is 2.03). This provides some evidence that investors earn some profit although small relative to profits from the naive option strategy discussed above. We do not find that these results differ in different subamples: repeat vs non-repeat filers, multiple vs nonmultiple filers, and institutional vs noninstitutional filers (untabulated).

In conclusion, while we document abnormal trading volume in stock market prior to the announcement of the switch, the economic magnitude of possible profits is significantly smaller in the stock market compared to the profits from trading in the options market. We acknowledge that blockholders can pursue complex strategy across stock and options, which may lead to larger profits in both markets, but these strategies are not observable and hence we cannot quantify their impact.

3.2 Reverse switches

In this section we examine reverse switches, i.e., cases in which a 13D filing is later followed by a 13G filing. According to SEC, "only a security holder who was initially eligible to report its beneficial ownership on a Schedule 13G and was later required to file a Schedule 13D may switch to reporting on a Schedule 13G."[11] Additionally, any party who has filed a Schedule 13D may again report its beneficial ownership on Schedule 13G so long as the shares are no longer held with control intent (SEC Rule 13d-1(h)). The SEC further clarifies that if the security holder was not originally eligible to file a Schedule 13G, instead files a Schedule 13D to report its beneficial ownership and later files a final amendment on Schedule 13D to report that its beneficial ownership of the class of securities fell to five percent or below, then the security holder may thereafter qualify to file a Schedule 13G if the security holder's beneficial ownership of the securities again increases to above five percent. In other words, if a 13D filer falls below the five percent ownership reporting threshold

[11] https://www.sec.gov/divisions/corpfin/guidance/reg13d-interp.htm. The link was last accessed on 09.07.2020.

and then later climbs above this threshold, it may switch to a 13G position. Therefore, the reason for a "reverse switch" may differ case by case: some of reverse switches maybe a result of change of positions among SEC thresholds of 13D and 13G's, as discussed right above; while other reverse switches may reflect investor's change of intentions from active to passive presumably because the investor has no intentions to influence management decisions anymore (see footnote 158 in Giglia, 2016).

Table E.1 in Appendix F shows the distribution of the reverse switches. We observe 2,471 reverse switches in Edgar during our 1994-2017 sample period. Once we merge the reverse switches with OptionMetrics there are 501 reverse switches.

The results in Table E.2 show evidence of a positive return jump on the day of the announcement of the reverse switch, although not as overwhelming as the reaction on announcing a switch from 13G to 13D (see Table B.1). Additionally, Table E.3 shows evidence of abnormal option trading especially in options that expire after the announcement of a reverse switch. The coefficients associated with *D_30*, *D_10*, and *D_20* are significant for all regression specifications where the dependent variable extension is *_exp* or *_exp5*. For example, when the dependent variable is *ln(C_otm_exp)*, the coefficients associated with *D_30*, *D_10*, and *D_20* are 0.751 (t-statistics = 14.08), 0.851 (t-statistics = 13.48), and 0.687 (t-statistics = 12.51), respectively.

The results reported in Table E.2 and Table E.3 can be due to a passive blockholder who falls below the five percent ownership reporting threshold and then later builds up ownership position above this threshold and then may switch to a 13G position. This passive blockholder while building a sizable stock position in the subject company also utilizes options to earn additional pecuniary benefits. The 13G announcement is viewed positively by the rest of the market participants and consequently there is a positive jump in price in the subject company on the day of the announcement.

The results in Table E.2 and Table E.3 can also be due to a genuine investor's change of intentions from active to passive, presumably because the investor has no intentions to influence management decisions anymore. This action can be interpreted positively by the rest of the market participants as a signal that the subject firm's management does not need to be disciplined and is functioning optimally. The blockholder uses options to earn extra pecuniary benefits. Unfortunately, we cannot differentiate between these two cases in the data.

3.3 Are results due to other events?

It is possible that the abnormal options trading 10 days before a switch is due to some confounding corporate event. Augustin, Brenner, and Subrahmanyam (2019) show that only 17 of the 467 mergers and acquisitions (M&A) deals in their sample have a filing in the 30 days prior to the M&A announcement date. We find 155 M&A announcements from either the target or the subject firm within the [-30, +30] period of the 795 switch events in our identified sample. We re-run our main results reported in Table 3 after we exclude these 155 switch events confounded with M&A announcements and the results are robust to excluding these events.

3.4 Non-zero volume observations

The reported results so far we considered the data as recorded in OptionMetrics, i.e., if there is no volume on a certain day there is no observation for that day in the sample. If certain option type (defined in Table A.2 in the Appendix) has no observation for certain event day given an event, we fill its volume on that day by 0. Specifically, we keep events which have at least one daily observation of aggregate call option volume in both treatment and control periods. If there is an observation for volume in a certain day we proceed in the following way. For example, if there is call option then we check whether this volume is recorded for OTM, ATM, or ITM options and if all observed call volume is OTM call option we set the volumes for ATM and ITM options as zeroes.

In this section, we examine our main test results with that we drop these zero observations results. As stated above, we now include only days for which there is an observation for volume in OptionMetrics. The test results remains similar if not stronger. For example, the mean-adjusted average abnormal call volume and put volumes are 380.7 and 262.3, respectively. If we fill in zeroes for non-trading days those average are reduced to 288.9.1 and 195.6, as reported in our main test in Table 3 . Furthermore, for the OTM EXP calls, it is 487.2 if we remove all of the zero volume days; for the ITM EXP puts, it is 136. Both these values are greater than the results reported in Table 3 (351.7 and 98.2). Overall, we find our main results are robust to excluding the non-zero volume days. This suggests that our previous reported findings may underestimate the true level of the abnormal trading activities.

4 Conclusion

This paper provides an empirical analysis of abnormal option trading prior to announcements of activism intentions made by passive blockholders. These switchers possess private information that is easily manipulative because it depends on the psyche of the blockholders. We document abnormal option trading within the 10-days window prior to such announcements consistent with switchers taking advantage of their information. One can refer to this trading as legal insider trading because switchers can lawfully trade on their information which is nonpublic and material.

We also document abnormal options trading *before* the 10-days window. One can refer to this trading as opportunistic trading because the switchers are taking advantage of their information even before the date they claim they changed their intentions from passive to activist. The evidence that our abnormal option trading is restricted to options expiring after the announcements strengthens our identification that the abnormal option activities we observe is due to the private information possessed initially by the switchers or parties closely related to them.

We study different subsamples of filers: repeat switchers vs. non-repeat switchers, multiple switchers vs nonmultiple switchers, and institutional vs other filers. For all these subsamples we document both legal and illegal abnormal option trading activities in options expiring after the announcement.

While not the main point of the paper, we also look at reverse switches. These results are not as clear-cut because some of reverse switches maybe a result of a change of positions among SEC thresholds of 13D and 13G's, while other reverse switches may reflect investor's change of intentions from active to passive presumably because the investor has no intentions to influence management decisions anymore.

Additionally, we also study abnormal stock trading. While we document abnormal stock trading, the possible profits are significantly smaller than those in options markets. Regardless, we observe abnormal stock trading in [-30, -11] and [-10, -1] periods, i.e., opportunistic and legal stock trading. These results also hold for all subsamples: repeat switchers vs. non-repeat switchers, multiple switchers vs nonmultiple switchers, and institutional vs other filers.

References

Ahern, K. R. (2017). Information networks: evidence from illegal insider trading tips. *Journal of Financial Economics*, 125(10, 26–47.

Ajinkya, B. B., Jain, P. C. (1989). The behavior of daily stock market trading volume. *Journal of Accounting and Economics*, 11(4), 331–359.

An, B. J., Ang, A., Bali, T. G., and Cakici, N. (2014). The joint cross section of stocks and options. *The Journal of Finance*, 69(5), 2279–2337.

Ang, A., Chen, J., and Xing, Y. (2006). Downside risk. *The Review of Financial Studies*, 19(4), 1191–1239.

Anthony, J. H. (1988). The interrelation of stock and options market trading-volume data. *The Journal of Finance*, 43(4), 949–964.

Appel, I. R., Gormley, T. A., and Keim, D. B. (2019). Standing on the shoulders of giants: The effect of passive investors on activism. *The Review of Financial Studies*, 32(7), 2720–2774.

Augustin, P., Brenner, M., and Subrahmanyam, M. G. (2019). Informed options trading prior to takeover announcements: insider trading? *Management Science*, 65(12), 5697–5720.

Back, K. (1993). Asymmetric information and options. *The Review of Financial Studies*, 6(3), 435–472.

Bainbridge, S. M. (2001). The law and economics of insider trading: A comprehensive primer. Available at SSRN 261277, *working paper*

Bebchuk, L. A., Brav, A., Jiang. W., and Keusch, T. (2020). Dancing with activists. *Journal of Financial Economics*, 137(1), 1–41.

Biais, B., and Hillion, P. (1994). Insider and liquidity trading in stock and options markets. *The Review of Financial Studies*, 7(4), 743–780.

Black, F. (1975). Fact and fantasy in the use of options. *Financial Analysts Journal*, 31(4), 36–41.

Brav, A., Dasgupta, A., and Mathews, R. D. (2016). Wolf pack activism, *working paper*.

Brav, A., Jiang, W., Partnoy, F., and Thomas, R. (2008). Hedge fund activism, corporate governance, and firm performance. *The Journal of Finance*, 63(4), 1729–1775.

Cao, H. H. (1999). The effect of derivative assets on information acquisition and price behavior in a rational expectations equilibrium. *The Review of Financial Studies*, 12(1), 131–163.

Cao, C., Chen, Z., and Griffin, J. M. (2005). Informational content of option volume prior to takeovers. *The Journal of Business*, 78(3), 1073–1109.

Cao, J., Han, B. (2013). Cross section of option returns and idiosyncratic stock volatility. *Journal of Financial Economics*, 108(1), 231–249.

Chae, J. (2005). Trading volume, information asymmetry, and timing information. *The Journal of Finance*, 60(1), 413–442.

Chakravarty, S., Gulen, H., and Mayhew, S. (2004). Informed trading in stock and option markets. *The Journal of Finance*, 59(3), 1235-1257.

Collin-Dufresne, P., Fos, V., and Muravyev, D. (2020). Informed trading in the stock market and option price discover. *Journal of Financial and Quantitative Analysis*, forthcoming.

Conrad, J., Dittmar, R. F., and Ghysels, E. (2013). Ex ante skewness and expected stock returns. *The Journal of Finance*, 68(1), 85–124.

Cooper, M. J., Gulen, H., and Schill, M. J. (2008). Asset growth and the cross-section of stock returns. *The Journal of Finance*, 63(4), 1609–1651.

Cready, W. M., Ramanan, R. (1991). The power of tests employing log-transformed volume in detecting abnormal trading. *Journal of Accounting and Economics*, 14(2), 203–214

Diamond, D. W., Verrecchia, R. E. (1987). Constraints on short-selling and asset price adjustment to private information. *Journal of Financial Economics*, 18(2), 277–311.

Easley, D., O'Hara, M., and Srinivas, P. S. (1998). Option volume and stock prices: evidence on where informed traders trade. *The Journal of Finance*, 53(2), 431–465.

Farago, A., Tédongap, R. (2018). Downside risks and the cross-section of asset returns. *Journal of Financial Economics*, 129(1), 69–86.

Gârleanu, N., Pedersen, L. H., and Poteshman, A. M. (2009). Demand-based option pricing. *The Review of Financial Studies*, 22(10), 4259–4299.

Giglia, K. (2016). Little letter, a big difference: an empirical inquiry into possible misuse of Schedule 13G/13D Filings. *Columbia Law Review*, 116(1), 105–145.

Glosten, L. R., and Milgrom, P. R. (1985). Bid, ask and transaction prices in a specialist market with heterogeneously informed traders. *Journal of Financial Economics*, 14(1), 71–100.

Jaffe, J. F. (1975). On the use of public information in financial markets. *The Journal of Finance*, 30(3), 831–839.

Klein, A., Zur, E. (2009). Entrepreneurial shareholder activism: Hedge funds and other private investors. *The Journal of Finance*, 64(1), 187–229.

Kyle, A. S. (1985). Continuous auctions and insider trading. *Econometrica*, 53(6), 1315–1335.

Manaster, S., and Rendleman Jr, R. J. (1982). Option prices as predictors of equilibrium stock prices. *The Journal of Finance*, 37(4), 1043–1057.

Mayhew, S., Sarin, A., and Shastri, K. (1995). The allocation of informed trading across related markets: An analysis of the impact of changes in equity-option margin requirements. *The Journal of Finance*, 50(5), 1635–1653.

Meulbroek, L., (1992). An empirical analysis of illegal insider trading. *The Journal of Finance*, 47(5), 1661–1699.

Pan, J., and Poteshman, A. M. (2006). The information in option volume for future stock prices. *The Review of Financial Studies*, 19(3), 871–908.

Patell, J. M., Wolfson, M. A., 1979, Anticipated information releases reflected in call option prices, *Journal of Accounting and Economics*, 1(2), 117–140.

Poteshman, A. M., 2006, Unusual option market activity and the terrorist attacks of September 11, 2001, *The Journal of Business*, 79(4), 1703–1726.

Stephan, J. A., and Whaley, R. E. (1990). Intraday price change and trading volume relations in the stock and stock option markets. *The Journal of Finance*, 45(1), 191–220.

Table 1. Distribution of switch filing events from Schedule 13G to 13D

This table reports the distribution of switch events, subject firms, and filers across years. A switch event is an event of filing a Schedule 13D after the same filer has filed a Schedule 13G on the same subject firm. Panel A shows the distribution of the hand-collected data from the EDGAR database. This sample is merged with options data for the subject firms from OptionMetrics. We collect option data for 140 days before each event. OptionMetrics covers data available after 1997. Panel B reports the distribution of this final sample used in our analyses.

Year	Panel A: Edgar			Panel B: Edgar and OptionMetrics		
	(1)	(2)	(3)	(4)	(5)	(6)
	# switch	# subject	# filer	# switch	# subject	# filer
1994	5	5	4	na	na	na
1995	9	9	6	na	na	na
1996	14	14	11	na	na	na
1997	101	93	87	15	14	13
1998	158	143	125	37	35	30
1999	217	174	190	24	23	22
2000	216	191	182	41	34	38
2001	204	188	188	17	15	17
2002	196	183	172	22	22	21
2003	185	173	174	25	23	25
2004	167	142	156	14	13	14
2005	191	173	162	35	31	34
2006	211	187	170	49	46	47
2007	298	259	242	69	62	58
2008	307	272	251	69	63	63
2009	212	180	186	38	35	34
2010	192	172	171	28	26	26
2011	216	202	144	45	42	42
2012	146	137	129	45	45	40
2013	171	159	153	43	40	42
2014	159	147	138	49	46	47
2015	218	196	190	44	43	42
2016	235	220	194	54	51	50
2017	180	170	143	32	30	31
Total	4,208	3,789	3,568	795	739	736

Table 2. Summary statistics

This table reports the summary statistics of option volume variables in Panel A and the control variables we use in our multivariate regression analysis in Panel B. All variables are explain in Appendix A. The treatment and the control periods are [-30, -1] and [-140, -41], respectively. There are 795 observations in Panel A.

Panel A: Option volume

	[-140, -41]			[-30, -1]		
	Mean	Median	St.dev.	Mean	Median	St.dev.
C	882.133	55.493	3451.937	1262.849	75.500	6305.456
C_otm	560.979	31.900	2322.982	792.708	38.273	4262.979
C_otm_exp	162.175	12.394	581.492	649.337	34.476	3481.478
C_otm_exp5	15.327	0.000	152.534	73.943	0.000	470.065
C_atm	62.614	1.843	258.951	99.410	0.136	494.986
C_atm_exp	8.529	0.282	38.248	75.300	0.045	407.960
C_atm_exp5	1.137	0.000	9.835	10.998	0.000	94.601
C_itm	258.539	15.580	1009.859	370.730	17.348	2207.401
C_itm_exp	60.050	3.714	245.215	294.564	14.095	2032.863
C_itm_exp5	4.933	0.000	42.352	30.972	0.000	221.851
P	633.469	26.567	2598.200	895.736	31.524	4256.502
P_otm	384.098	13.209	1672.903	553.627	13.409	2747.699
P_otm_exp	104.793	3.829	464.129	455.694	11.650	2290.297
P_otm_exp5	14.878	0.000	227.541	63.208	0.000	623.749
P_atm	50.389	0.786	261.392	67.213	0.000	369.716
P_atm_exp	7.897	0.056	44.126	46.430	0.000	252.834
P_atm_exp5	1.802	0.000	27.892	10.567	0.000	130.598
P_itm	198.982	7.986	778.696	274.897	8.500	1409.814
P_itm_exp	53.543	1.915	218.253	189.500	6.750	845.784
P_itm_exp5	4.992	0.000	45.968	22.210	0.000	117.009

Panel B: Firm characteristics

	Mean	Median	St.dev.
ln(Size)	6.561	6.479	1.424
ln(BM)	-0.863	-0.814	0.992
ln(Stock volume)	12.611	12.571	1.516
Return	-0.001	-0.001	0.034
Volatility	0.002	0.001	0.005
Skewness	0.335	0.282	1.842

Table 3. Mean-adjusted average abnormal option trading volume

This table reports the mean-adjusted abnormal option trading volume of options prior to the switch announcement events. Specifically, we report the means and the t-statistics for *AAV30* (Eq.2), *AAV10* (Eq.3), and *AAV20* (Eq.4). *AAV30*, *AAV10*, and *AAV20* is the average mean-adjusted abnormal option trading volume when the treatment period is [-30,-1], [-10,-1], and [-30,-11], respectively. All variables are explain in Appendix A.

Variable	AAV30 [-30,-1]			AAV10 [-10,-1]			AAV20 [-30,-11]		
	Mean	t-stats	N	Mean	t-stats	N	Mean	t-stats	N
C	288.900	2.28	795	387.900	1.83	785	152.700	1.75	795
C_otm	175.500	2.17	795	180.900	1.65	785	112.700	1.78	795
C_otm_exp	351.700	4.33	795	421.100	3.84	785	258.500	4.44	795
C_otm_exp5	41.809	4.03	795	50.806	3.30	785	30.164	3.73	795
C_atm	27.760	2.55	795	39.671	2.89	785	18.388	1.52	795
C_atm_exp	48.151	4.72	795	68.173	4.83	785	34.902	3.32	795
C_atm_exp5	6.924	3.19	795	8.094	3.01	785	5.351	2.20	795
C_itm	85.707	1.64	795	167.300	1.29	785	21.542	0.98	795
C_itm_exp	169.700	3.30	795	280.100	2.17	785	91.780	4.95	795
C_itm_exp5	18.199	3.65	795	18.428	3.86	785	14.681	2.97	795
P	195.600	3.00	795	215.400	2.42	785	129.000	2.52	795
P_otm	126.400	2.85	795	149.800	2.35	785	80.505	2.43	795
P_otm_exp	251.800	5.11	795	322.000	4.78	785	183.600	5.12	795
P_otm_exp5	33.621	3.41	795	32.801	3.78	785	30.918	2.74	795
P_atm	12.550	2.38	795	16.083	2.59	785	8.842	1.23	795
P_atm_exp	27.377	4.93	795	38.401	5.23	785	20.063	3.47	795
P_atm_exp5	6.054	2.45	795	7.296	3.68	785	4.977	1.64	795
P_itm	56.690	2.33	795	49.530	1.28	785	39.657	1.98	795
P_itm_exp	98.183	5.22	795	120.700	4.35	785	66.740	5.48	795
P_itm_exp5	12.358	4.81	795	14.041	4.34	785	8.005	4.37	795

Table 4. Market model average abnormal option trading volume

This table reports the market-model-adjusted abnormal option trading volume of options prior to the switch announcement events. It replicates Table 3 by substituting the mean-adjusted measures with market-model-adjusted ones.

Variable	AAV30 [-30,-1]			AAV10 [-10,-1]			AAV20 [-30,-11]		
	Mean	*t*-stats	N	Mean	*t*-stats	N	Mean	*t*-stats	N
C	285.800	2.01	787	463.300	1.87	778	181.700	1.68	787
C_otm	165.700	2.00	776	222.300	1.88	767	127.600	1.74	776
C_otm_exp	432.500	4.14	751	556.000	4.00	747	357.500	4.06	751
C_otm_exp5	163.700	4.64	135	173.600	3.74	135	158.300	4.49	135
C_atm	39.883	2.22	585	47.615	2.36	582	35.553	1.55	585
C_atm_exp	93.005	3.76	497	135.100	5.10	497	69.341	2.35	497
C_atm_exp5	77.451	2.18	77	64.671	2.84	77	83.753	1.80	77
C_itm	100.200	1.37	731	230.800	1.35	727	27.842	0.73	731
C_itm_exp	228.000	3.16	686	401.400	2.33	683	132.700	4.60	686
C_itm_exp5	98.637	3.52	111	121.300	3.40	111	86.972	2.94	111
P	177.700	3.09	768	288.000	2.65	759	117.600	2.68	768
P_otm	146.500	3.12	702	237.600	2.96	697	98.622	2.62	702
P_otm_exp	338.100	5.53	663	482.300	5.09	660	261.100	5.36	663
P_otm_exp5	242.800	2.74	105	220.100	3.32	104	253.400	2.41	105
P_atm	26.379	2.28	532	31.650	2.38	531	24.297	1.39	532
P_atm_exp	68.046	4.71	428	93.885	5.13	427	55.266	3.29	428
P_atm_exp5	83.556	2.07	65	93.187	3.35	65	78.105	1.50	65
P_itm	59.451	1.94	745	78.058	1.26	736	47.355	1.88	745
P_itm_exp	135.000	5.05	687	196.200	3.76	683	100.600	5.22	687
P_itm_exp5	56.829	2.26	99	110.700	4.12	99	25.374	0.81	99

Table 5. Options volume regression results

This table reports regression results using Eq.7 for 20 different dependent variables. To save space, the table reports the coefficient associated with variables of interest only, i.e., *D_30*, *D_20*, and *D_10*. The following control variables are included in all regression specifications: *ln(Size)*, *ln(BM)*, *ln(Stock volume)*, *Return*, *Volatility*, and *Skewness*. Detailed variable definitions are provided in Appendix A. T-statistics are shown in parentheses and are based on robust standard errors and clustered by event. All regressions include year fixed effects.

	Panel A: [-30,-1]				Panel B: [-10,-1]				Panel C: [-30,-11]			
Dep. Variable	D_30	t-stats	N	R^2	D_10	t-stats	N	R^2	D_20	t-stats	N	R^2
ln(C)	0.008	0.23	36,700	0.44	0.015	0.33	31,367	0.44	0.004	0.11	33,647	0.43
ln(C_otm)	-0.003	-0.09	31,548	0.41	-0.016	-0.33	26,965	0.41	0.004	0.09	28,942	0.41
ln(C_otm_exp)	0.808	17.29	25,768	0.35	0.913	15.71	21,326	0.34	0.749	15.76	23,169	0.34
ln(C_otm_exp5)	0.685	5.78	3,055	0.40	0.686	4.38	2,278	0.41	0.663	4.94	2,677	0.38
ln(C_atm)	0.097	1.36	5,698	0.39	0.146	1.45	4,860	0.40	0.068	0.84	5,207	0.39
ln(C_atm_exp)	1.314	14.53	3,728	0.31	1.631	13.50	2,980	0.32	1.105	11.22	3,243	0.27
ln(C_atm_exp5)	1.268	7.16	692	0.38	1.506	6.86	498	0.42	1.078	5.08	553	0.33
ln(C_itm)	-0.021	-0.48	25,234	0.34	-0.006	-0.11	21,488	0.34	-0.030	-0.62	23,054	0.33
ln(C_itm_exp)	0.773	14.45	18,401	0.28	0.931	14.87	14,976	0.27	0.673	11.81	16,269	0.26
ln(C_itm_exp5)	0.629	3.99	2,372	0.26	0.785	4.67	1,781	0.25	0.559	3.13	1,994	0.24
ln(P)	0.026	0.64	29,580	0.40	0.024	0.47	25,181	0.41	0.025	0.58	27,077	0.40
ln(P_otm)	-0.007	-0.16	22,749	0.36	-0.022	-0.37	19,379	0.37	-0.003	-0.06	20,849	0.36
ln(P_otm_exp)	0.803	14.48	17,475	0.30	0.900	12.90	14,279	0.29	0.740	12.69	15,587	0.28
ln(P_otm_exp5)	0.809	5.43	2,243	0.33	0.753	4.12	1,685	0.30	0.814	4.67	1,927	0.31
ln(P_atm)	0.164	2.38	4,948	0.36	0.225	2.29	4,220	0.37	0.124	1.52	4,514	0.36
ln(P_atm_exp)	1.168	12.46	3,002	0.26	1.523	12.24	2,353	0.28	0.920	8.83	2,577	0.23
ln(P_atm_exp5)	1.075	6.96	552	0.35	1.491	7.50	383	0.41	0.718	3.50	432	0.31
ln(P_itm)	0.064	1.39	21,488	0.31	0.062	1.10	18,229	0.32	0.063	1.26	19,611	0.32
ln(P_itm_exp)	0.661	11.54	14,955	0.25	0.808	11.64	12,019	0.24	0.562	9.57	13,116	0.24
ln(P_itm_exp5)	0.542	3.66	2,099	0.22	0.637	3.76	1,514	0.23	0.446	2.74	1,713	0.21

Table 6. Subsample option volume regression results

This table reports regression results using Eq.7 for six different dependent variables and for six different subsamples. To save space, the table reports the coefficient associated with variables of interest only, i.e., *D_30*, *D_20*, and *D_10*. The following control variables are included in all regression specifications: *ln(Size)*, *ln(BM)*, *ln(Stock volume)*, *Return*, *Volatility*, and *Skewness*. Detailed variable definitions are provided in Appendix A. T-statistics are shown in parentheses and are based on robust standard errors and clustered by event. All regressions include year fixed effects.

	Panel A: [-30,-1]				Panel B: [-10,-1]				Panel C: [-30,-11]			
Dep. Variable	D_30	*t*-stats	N	R^2	D_10	*t*-stats	N	R^2	D_20	*t*-stats	N	R^2
Subsample: Repeated filers												
ln(C_otm_exp)	0.815	13.58	15,651	0.38	0.981	13.46	13,025	0.37	0.718	11.56	14,102	0.37
ln(C_atm_exp)	1.433	11.46	2,181	0.34	1.790	11.00	1,749	0.34	1.214	9.13	1,924	0.30
ln(C_itm_exp)	0.774	11.22	10,912	0.30	0.951	11.90	8,894	0.30	0.661	9.11	9,655	0.28
ln(P_otm_exp)	0.811	10.72	10,587	0.30	0.981	10.45	8,713	0.30	0.703	8.69	9,449	0.29
ln(P_atm_exp)	1.226	10.00	1,816	0.29	1.545	10.19	1,434	0.28	1.017	7.04	1,579	0.26
ln(P_itm_exp)	0.688	9.31	9,189	0.28	0.827	9.44	7,456	0.26	0.594	7.67	8,056	0.26
Subsample: Nonrepeated filers												
ln(C_otm_exp)	0.803	10.86	10,117	0.32	0.812	8.70	8,301	0.31	0.799	10.87	9,067	0.31
ln(C_atm_exp)	1.159	9.34	1,547	0.31	1.447	9.27	1,231	0.34	0.960	6.78	1,319	0.25
ln(C_itm_exp)	0.766	9.50	7,489	0.27	0.897	9.23	6,082	0.26	0.685	7.82	6,614	0.24
ln(P_otm_exp)	0.781	10.01	6,888	0.31	0.759	7.68	5,566	0.30	0.786	9.63	6,138	0.30
ln(P_atm_exp)	1.061	7.05	1,186	0.23	1.456	6.93	919	0.28	0.755	5.25	998	0.19
ln(P_itm_exp)	0.621	7.11	5,766	0.22	0.779	7.10	4,563	0.22	0.526	5.91	5,060	0.21

Table 6. Subsample option volume regression results (cont.)

	Panel A: [-30,-1]				Panel B: [-10,-1]				Panel C: [-30,-11]			
Dep. Variable	D_30	t-stats	N	R^2	D_10	t-stats	N	R^2	D_20	t-stats	N	R^2
Subsample: Multiple filers												
ln(C_otm_exp)	0.663	9.40	9,100	0.33	0.739	8.27	7,537	0.32	0.618	8.39	8,164	0.32
ln(C_atm_exp)	1.405	8.45	1,013	0.35	1.758	7.63	802	0.35	1.192	6.86	885	0.30
ln(C_itm_exp)	0.663	7.44	6,172	0.24	0.801	7.73	5,052	0.24	0.566	5.95	5,411	0.22
ln(P_otm_exp)	0.696	7.50	6,011	0.28	0.771	6.76	4,943	0.28	0.648	6.45	5,358	0.27
ln(P_atm_exp)	0.974	5.01	826	0.35	1.419	5.57	646	0.37	0.712	3.51	708	0.33
ln(P_itm_exp)	0.566	5.84	5,212	0.27	0.691	5.86	4,238	0.27	0.476	4.65	4,584	0.27
Subsample: Nonmultiple filers												
ln(C_otm_exp)	0.889	14.70	16,668	0.38	1.001	13.43	13,789	0.37	0.827	13.56	15,005	0.36
ln(C_atm_exp)	1.302	12.00	2,715	0.31	1.596	11.08	2,178	0.32	1.095	9.23	2,358	0.27
ln(C_itm_exp)	0.830	12.74	12,229	0.31	0.989	12.71	9,924	0.31	0.734	10.72	10,858	0.29
ln(P_otm_exp)	0.862	12.73	11,464	0.34	0.963	11.32	9,336	0.33	0.798	11.23	10,229	0.32
ln(P_atm_exp)	1.213	11.17	2,176	0.25	1.567	10.97	1,707	0.27	0.962	7.83	1,869	0.22
ln(P_itm_exp)	0.718	10.21	9,743	0.26	0.871	10.24	7,781	0.25	0.619	8.63	8,532	0.25
Subsample: Institutional filers												
ln(C_otm_exp)	0.815	12.60	14,077	0.38	0.954	11.93	11,648	0.37	0.734	11.26	12,645	0.37
ln(C_atm_exp)	1.436	11.27	2,042	0.31	1.779	11.96	1,634	0.36	1.210	8.43	1,783	0.32
ln(C_itm_exp)	0.759	10.47	9,946	0.31	0.940	10.99	8,052	0.30	0.649	8.66	8,803	0.29
ln(P_otm_exp)	0.825	10.70	9,904	0.34	0.978	10.21	8,098	0.30	0.732	8.93	8,860	0.29
ln(P_atm_exp)	1.165	8.80	1,688	0.25	1.484	9.46	1,330	0.29	0.941	5.92	1,458	0.26
ln(P_itm_exp)	0.671	8.69	8,405	0.26	0.828	9.04	6,766	0.26	0.568	7.11	7,346	0.27
Subsample: Other filers												
ln(C_otm_exp)	0.789	11.55	11,691	0.32	0.846	9.97	9,678	0.31	0.755	10.88	10,524	0.31
ln(C_atm_exp)	1.189	9.77	1,686	0.30	1.446	8.99	1,346	0.33	1.021	7.74	1,460	0.23
ln(C_itm_exp)	0.797	10.44	8,455	0.27	0.932	10.29	6,924	0.27	0.703	8.43	7,466	0.25
ln(P_otm_exp)	0.780	10.10	7,571	0.30	0.807	8.06	6,181	0.29	0.756	9.37	6,727	0.29
ln(P_atm_exp)	1.154	8.53	1,314	0.25	1.504	7.52	1,023	0.29	0.892	7.11	1,119	0.20
ln(P_itm_exp)	0.676	7.76	6,550	0.25	0.812	7.56	5,253	0.24	0.581	6.61	5,770	0.23

Table 7. Stock volume regression results

This table reports regression results using Eq.7 for when the dependent variable is *ln(Stock volume)*. To save space, the table reports the coefficient associated with variables of interest only, i.e., *D_30*, *D_20*, and *D_10*. The following control variables are included in all regression specifications: *ln(Size)*, *ln(BM)*, *Return*, *Volatility*, and *Skewness*. Detailed variable definitions are provided in Appendix A. T-statistics are shown in parentheses and are based on robust standard errors and clustered by event. All regressions include year fixed effects.

	Panel A: [-30,-1]				Panel B: [-10,-1]				Panel C: [-30,-11]			
Dep. Variable	D_30	t-stats	N	R^2	D_10	t-stats	N	R^2	D_20	t-stats	N	R^2
Full sample												
ln(Stock volume)	0.156	5.98	54,445	0.36	0.275	8.30	46,479	0.35	0.091	3.34	50,075	0.35
Subsample: Repeated filers												
ln(Stock volume)	0.157	4.86	31,915	0.46	0.282	6.80	27,233	0.46	0.088	2.64	29,346	0.46
Subsample: Nonrepeated filers												
ln(Stock volume)	0.175	4.05	22,530	0.30	0.288	5.43	19,246	0.30	0.113	2.48	20,729	0.29
Subsample: Multiple filers												
ln(Stock volume)	0.165	3.99	21,849	0.34	0.348	6.43	18,663	0.34	0.064	1.52	20,099	0.34
Subsample: Nonmultiple filers												
ln(Stock volume)	0.160	4.81	32,596	0.40	0.236	5.82	27,816	0.40	0.118	3.36	29,976	0.40
Subsample: Institutional filers												
ln(Stock volume)	0.176	5.72	29,202	0.45	0.304	7.57	24,893	0.46	0.106	3.29	26,867	0.45
Subsample: Other filers												
ln(Stock volume)	0.137	3.25	25,243	0.30	0.245	4.69	21,586	0.30	0.077	1.77	23,208	0.30

A Variable definitions and constructions

C (*P*) — aggregated call (put) option volume of a firm in a day. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_otm (*P_otm*) — aggregated out-the-money call (put) option volume of a firm in a day. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_otm_exp (*P_otm_exp*) — aggregated out-the-money call (put) option volume of a firm in a day expiring after the event. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_otm_exp5 (*P_otm_exp5*) — aggregated out-the-money call (put) option volume of a firm in a day that expire between event days [0, 5]) volume. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_atm (*P_atm*) — aggregated at-the-money call (put) option volume for a firm in day. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_atm_exp (*P_atm_exp*) — aggregated at-the-money call (put) option volume for a firm in day expiring after the event. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_atm_exp5 (*P_atm_exp5*) — aggregated at-the-money call (put) option volume for a firm in day that expire between event days [0, 5]) volume. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_itm (*P_itm*) — aggregated in-the-money call (put) option volume for a firm in day. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_itm_exp (*P_itm_exp*) — aggregated in-the-money call (put) option volume for a firm in day expiring after the event. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

C_itm_exp5 (*P_itm_exp5*) — aggregated in-the-money call (put) option volume for a firm in day that expire between event days [0, 5]) volume. (Source: OptionMetrics; variable *volume* in sub-database *Opprcd.*)

D_30 — a dummy variable that equal one if day t is in the [-30, -1] period and zero if it is in the [-140, -31] period.

D_10 — a dummy variable that equal one if day t is in the [-10, -1] period and zero if it is in the [-140, -31] period.

D_20 — a dummy variable that equal one if day t is in the [-30, -11] period and zero if it is in the [-140, -31] period.

ln(Size) — The natural logarithm of market value of equity in millions recorded at the most recent calendar year end. (Source: Compustat; variables $prcc\_c \times csho$).

ln(BM) — The natural logarithm of the book-to-market-equity ratio where book equity is the stockholders' equity (*seq*), plus balance sheet deferred taxes and investment tax credit (*txditc*), minus book value of preferred stock (*pstkl* or *pstkrv* or *pstk*) and market equity is the price (*prcc_c*) times shares outstanding (*csho*) at the end of the most recent calendar year (Davis, Fama, and French, 2000; Cooper, Gulen, and Schill, 2008). (Source: Compustat; variables *seq*, *txditc*, *pstkl*, *pstkrv*, *pstk*, *prcc_c*, *csho*.)

ln(Volume) — The natural logarithm of a firm stock trading volume in a day. (Source: OptionMetrics; variable *volume* in sub-database *Secprd*.)

Return — Firm's daily stock return. (Source: OptionMetrics; variable *ret* in sub-database *Secprd*.)

Volatility — Stock return volatility is the standard deviation of daily stock returns during [-140, -1] period. (Source: OptionMetrics; variable *ret* in sub-database *Secprd*.)

Skewness — Stock return skewness is calculated using daily stock returns during [-140, -1] period. (Source: OptionMetrics; variable *ret* in sub-database *Secprd*.)

B Stock returns

To justify the notion that the blockholders have incentive to take advantage of the potential price jump during and after 13D-to-G switch announcements, we examine how likely the stock price increases are on and after the 13 D-to-G switch day. We examine if stock returns of the subject company on day 0 and day 1 are statistically higher than the rest of the days of [-30,30] by comparing the difference between them using T-test. The results are reported in Table B.1. We consider three sets of tests in this table: days [0,1] versus the rest of the days, days [0,1] versus the pre-event days [-30,-1], and days [0,1] versus the post-event days [2,30]. Overall, the difference between the treatment days [0,1] are on average about 1% higher than the three benchmark periods. These results indicate that stock returns are abnormally higher during the days when the switching news is announced (day 0 and 1) than days prior to and after the announcement. These findings provide supports to the argument that the stock returns are likely to be abnormally positive during the SEC 13D-to-G switch announcement. Therefore, this price jump is a good opportunity for the bullish (option) traders to benefit.

Table B.1. Announcement stock return

This table reports the daily equity return for subject firms around the 13G-to-D switch announcement. Treatment days are the announcement day and the following day (day 0 and 1). The control days are [-30, -1] or [2, 30]. The difference of the daily average stock returns are reported, alongside with T-stat and P-value.

Treatment Days	Control Days	Diff	T-stat	P-value
[0,1]	[-30,-1] and [2,30]	0.00967	8.77	<.0001
[0,1]	[-30,-1]	0.0091	7.22	<.0001
[0,1]	[2,30]	0.0103	10.32	<.0001

C Trading strategies

The switchers are perfectly informed investors because because they decide when the switch will occur. Appendix B show that there is a high likelihood that the price of the stock will jump on the day of the switch. Thus, the switcher will pursue bullish strategies. It is not possible to identify the exact strategies that the filers pursue, but these transactions will show up in the number of options contracts traded. For example, a bullish speculator will often choose to buy call options, due to the embedded leverage of such financial vehicles. However, if the speculator is perfectly informed, such as the switching blockholder, he can choose even more aggressive trading strategies: OTM call options, because they offer the greatest leverage and best cost compared to ITM and ATM calls.

Also, given that the switching blockholder has already established a sizable long position (5%) in the underlying stock, which necessitates the Schedule 13, he can also keep on writing put options. Since these puts are essentially covered puts and the stock price will increase, the blockholder will prefer to sell the more lucrative ITM (with higher premium) puts rather than OTM or ATM puts. Regardless, he can collect premium from writing OTM, ITM, and ATM puts.

Admittedly, longing OTM calls and shorting ITM puts are not the only two bullish strategies that the potential switching blockholder can pursue. In fact, there are numerous bullish strategies that can be pursued using options and stocks. Similar to Jayaraman, Frye, and Sabheral (2001) and Augustin Brenner Subrahmanyam (2019), we provide a list of possible strategies in next section of Appendix. Although it is difficult to identify the exact strategies that the switching blockholder would pursue, as long as he intends to take advantage of the soon-increasing stock prices, we expect to observe abnormal trading volume of OTM calls and ITM puts.

We present possible strategies that the filers can pursue on the subject companies. In the case when the filer knows he will file Schedule 13D at time zero (given he currently has Schedule 13G on the subject firm), he is essentially perfectly informed and knows when the price of the underlying stock will jump upward. If a trader is taking advantage of this information by long positions in options, he will prefer OTM call options because they will be offered at lower premiums compared to ATM and ITM options. If a trader is taking advantage of his information by short positions in options, he will prefer ITM put options because the investor will collect higher premiums than he could from deep OTM and ATM put options. The possible trading strategies include:

Strategy #1. Purchasing a call option If the investor knows that the price of the underlying security will go up on the day he switches from 13G to the 13D filing, one of the simplest strategies is to buy call options, especially OTM, as those will be much cheaper than either the ATM or ITM call options. This strategy implies that we should observe abnormal volume in OTM call options before the switch day.

Strategy #2. Selling a put option Because the switchers hold the underlying stock, they could also simply sell plain vanilla ITM put options given they know that price of the subject firm will increase. In this case we should observe abnormal trading volumes in ITM put options. This is a covered put, since the switcher has high inventory of the stock (at least 5% of the total shares).

Strategy #3. Synthetic long stock The "synthetic long stock" consists in buying a call and selling a put at the same strike price. This gives the payoff of a stock. This is a combination of Strategy #1 and Strategy #2 just described. It predicts abnormal trading volume in both OTM call options and ITM put options.

Strategy #4. Long call spread The long call spread strategy is constructed by buying a call option with strike K1 and selling a call option with strike K2, where $K1 < K2$. This strategy would be partly self financing. If we were to assume that leverage was optimized and the call options were OTM, then we would expect abnormal trading volumes in call options if this strategy is being employed. Such abnormal trading volumes should be relatively higher for OTM options than for ATM and ITM options.

Strategy #5. Long call ratio backspread This strategy consist in selling a call option with strike K1 and buying two call options with strike K2, where K1 ¡ K2. The advantage of this backspread is that, by selling one call option for every two purchased, part of the strategy is self-financing. Similar to the simple long call strategy, the long call ratio backspread provides the most leverage if it is constructed using OTM options. Hence, if it is being used, we would expect to see an abnormal trading volume in OTM call options in comparison to ATM and ITM options.

D Distribution of different subsamples

Table D.1. Repeated filers

This table reports the distribution of switch events, subject firms, and filers across years. A switch event is an event of filing a Schedule 13D after the same filer has filed a Schedule 13G on the same subject firm. Panel A shows the distribution of the hand-collected data from the EDGAR database. This sample is merged with options data for the subject firms from OptionMetrics. We collect option data for 140 days before each event. OptionMetrics covers data available after 1997. Panel B reports the distribution of this final sample used in our analyses.

Year	Panel A: Edgar			Panel B: Edgar and OptionMetrics		
	(1)	(2)	(3)	(4)	(5)	(6)
	# switch	# subject	# filer	# switch	# subject	# filer
1994	2	2	1	na	na	na
1995	4	4	1	na	na	na
1996	10	10	7	na	na	na
1997	31	31	17	5	5	3
1998	71	69	38	17	16	10
1999	77	70	50	15	14	13
2000	96	88	62	17	15	14
2001	65	63	49	6	6	6
2002	81	78	57	10	10	9
2003	69	67	58	13	13	13
2004	64	59	53	8	8	8
2005	97	90	68	22	18	21
2006	128	116	87	33	31	31
2007	163	153	107	45	42	34
2008	159	147	103	37	36	31
2009	103	96	77	20	19	16
2010	91	87	70	18	18	16
2011	124	123	52	25	25	22
2012	75	73	58	31	31	26
2013	88	85	70	26	24	25
2014	82	78	61	31	30	29
2015	106	101	78	26	26	24
2016	120	118	79	32	32	28
2017	97	95	60	18	17	17
Total	2,003	1,903	1,363	455	436	396

Table D.2. Multiple filers

This table reports the distribution of switch events, subject firms, and filers across years. A switch event is an event of filing a Schedule 13D after the same filer has filed a Schedule 13G on the same subject firm. Panel A shows the distribution of the hand-collected data from the EDGAR database. This sample is merged with options data for the subject firms from OptionMetrics. We collect option data for 140 days before each event. OptionMetrics covers data available after 1997. Panel B reports the distribution of this final sample used in our analyses.

Year	Panel A: Edgar			Panel B: Edgar and OptionMetrics		
	(1)	(2)	(3)	(4)	(5)	(6)
	# switch	# subject	# filer	# switch	# subject	# filer
1994	1	1	1	na	na	na
1995	4	4	3	na	na	na
1996	29	21	29	na	na	na
1997	55	40	49	3	2	3
1998	96	53	90	10	8	9
1999	87	62	81	5	4	5
2000	80	64	76	21	14	20
2001	77	64	75	8	6	8
2002	69	57	67	8	8	8
2003	76	51	76	12	10	12
2004	75	57	71	7	6	7
2005	90	66	79	15	11	15
2006	137	98	123	21	18	21
2007	135	100	120	26	19	23
2008	109	77	103	28	22	28
2009	95	75	86	19	16	19
2010	84	70	78	13	11	12
2011	67	58	65	25	22	25
2012	66	54	61	16	16	16
2013	62	50	59	18	15	18
2014	94	72	86	23	20	23
2015	81	66	75	15	14	14
2016	60	50	53	20	17	20
2017	97	95	60	14	12	14
Total	1,826	1,405	1,666	327	271	320

Table D.3. Institutional filers

This table reports the distribution of switch events, subject firms, and filers across years. Institutional filers are those that have filed 13F. A switch event is an event of filing a Schedule 13D after the same filer has filed a Schedule 13G on the same subject firm. Panel A shows the distribution of the hand-collected data from the EDGAR database. This sample is merged with options data for the subject firms from OptionMetrics. We collect option data for 140 days before each event. OptionMetrics covers data available after 1997. Panel B reports the distribution of this final sample used in our analyses.

Year	Panel A: Edgar			Panel B: Edgar and OptionMetrics		
	(1)	(2)	(3)	(4)	(5)	(6)
	# switch	# subject	# filer	# switch	# subject	# filer
1994	2	2	1	na	na	na
1995	4	4	1	na	na	na
1996	8	8	5	na	na	na
1997	19	18	13	6	6	4
1998	33	32	23	10	10	7
1999	50	49	37	12	11	10
2000	56	51	38	15	13	12
2001	39	38	31	1	1	1
2002	51	49	40	7	7	7
2003	42	42	37	11	11	11
2004	43	40	39	6	6	6
2005	79	72	57	19	15	18
2006	107	98	75	34	32	32
2007	133	128	97	45	43	35
2008	126	115	92	34	31	29
2009	73	69	56	15	14	11
2010	67	64	51	17	16	15
2011	61	60	44	25	24	23
2012	58	58	49	29	29	25
2013	69	65	58	21	20	20
2014	73	70	60	30	28	28
2015	88	80	68	26	25	24
2016	101	100	77	31	31	28
2017	71	70	51	16	16	15
Total	1,453	1,382	1,100	410	389	361

E Reverse switches

Table E.1. Distribution of reverse switch filing events from Schedule 13D to 13G
This table reports the distribution of switch events, subject firms, and filers across years. A switch event is an event of filing a Schedule 13G after the same filer has filed a Schedule 13D on the same subject firm. Panel A shows the distribution of the hand-collected data from the EDGAR database. This sample is merged with options data for the subject firms from OptionMetrics. We collect option data for 140 days before each event. OptionMetrics covers data available after 1997. Panel B reports the distribution of this final sample used in our analyses.

Year	Panel A: Edgar			Panel B: Edgar and OptionMetrics		
	(1)	(2)	(3)	(4)	(5)	(6)
	# switch	# subject	# filer	# switch	# subject	# filer
1994	1	1	1	na	na	na
1995	7	7	7	na	na	na
1996	21	21	10	na	na	na
1997	45	43	30	11	11	8
1998	411	373	219	86	83	60
1999	161	151	119	32	30	26
2000	155	140	110	27	25	24
2001	130	126	103	25	25	24
2002	98	90	87	15	14	13
2003	139	134	100	29	29	15
2004	102	94	89	14	14	14
2005	117	105	95	15	14	12
2006	117	103	100	16	15	16
2007	137	126	111	30	27	27
2008	132	117	109	30	27	28
2009	119	112	91	18	16	16
2010	78	75	65	12	12	11
2011	84	81	65	21	20	21
2012	71	71	55	19	19	16
2013	65	62	52	29	27	24
2014	59	59	50	18	18	18
2015	62	56	60	20	20	20
2016	94	89	81	23	22	21
2017	66	65	54	11	11	11
Total	2,471	2,301	1,863	501	479	425

Table E.2. Announcement stock return – reverse switches

This table reports the expected equity return for subject firms around the 13G-to-D switch announcement. Treatment days are the announcement day and the following day (day 0 and 1). The control days are [-30, -1] or [2, 30]. The difference of the daily average stock returns are reported, alongside with T-stat and P-value.

Treatment Days	Control Days	Diff	T-stat	P-value
[0,1]	[-30,-1] and [2,30]	0.0021	1.83	0.0067
[0,1]	[-30,-1]	0.0019	1.63	0.1029
[0,1]	[2,30]	0.0023	1.98	0.0474

Table E.3. Regression results – reverse switches

This table reports regression results using Eq.7 for 20 different dependent variables. To save space, the table reports the coefficient associated with variables of interest only, i.e., *D_30*, *D_20*, and *D_10*. The following control variables are included in all regression specifications: *ln(Size)*, *ln(BM)*, *ln(Stock volume)*, *Return*, *Volatility*, and *Skewness*. Detailed variable definitions are provided in Appendix B. *T*-statistics are shown in parentheses and are based on robust standard errors and clustered by event. All regressions include year fixed effects.

	Panel A: [-30,-1]				Panel B: [-10,-1]				Panel C: [-30,-11]			
Dep. Variable	D_30	*t*-stats	N	R^2	D_10	*t*-stats	N	R^2	D_20	*t*-stats	N	R^2
ln(C)	-0.012	-0.32	26,069	0.46	-0.023	-0.47	22,030	0.46	-0.006	-0.15	23,819	0.46
ln(C_otm)	-0.024	-0.60	22,214	0.44	-0.013	-0.25	18,748	0.44	-0.031	-0.69	20,249	0.44
ln(C_otm_exp)	0.751	14.08	17,885	0.38	0.851	13.48	14,513	0.37	0.687	12.51	15,924	0.37
ln(C_otm_exp5)	0.510	3.44	2,473	0.40	0.345	1.79	1,832	0.40	0.589	4.01	2,199	0.40
ln(C_atm)	0.093	1.06	4,025	0.41	0.086	0.71	3,389	0.43	0.107	1.11	3,680	0.42
ln(C_atm_exp)	1.115	9.94	2,509	0.31	1.230	8.58	1,942	0.31	1.022	8.52	2,166	0.29
ln(C_atm_exp5)	1.153	4.63	468	0.40	1.258	3.95	324	0.43	1.026	4.37	387	0.35
ln(C_itm)	0.016	0.33	18,130	0.35	-0.050	-0.84	15,385	0.35	0.055	1.02	16,543	0.35
ln(C_itm_exp)	0.802	12.40	12,699	0.31	0.886	11.45	10,168	0.31	0.741	11.02	11,131	0.30
ln(C_itm_exp5)	0.714	4.09	1,966	0.31	0.729	3.27	1,457	0.31	0.693	3.72	1,681	0.31
ln(P)	-0.031	-0.71	19,769	0.44	-0.093	-1.65	16,655	0.44	0.004	0.08	17,999	0.44
ln(P_otm)	0.025	0.51	14,977	0.42	-0.037	-0.58	12,622	0.42	0.059	1.13	13,614	0.42
ln(P_otm_exp)	0.762	10.88	11,116	0.35	0.787	8.98	8,876	0.33	0.731	10.53	9,756	0.34
ln(P_otm_exp5)	0.638	3.52	1,606	0.40	0.628	2.65	1,155	0.40	0.653	3.72	1,414	0.40
ln(P_atm)	0.012	0.13	3,117	0.39	0.050	0.35	2,624	0.40	0.001	0.01	2,853	0.40
ln(P_atm_exp)	0.934	8.39	1,844	0.28	1.121	6.98	1,410	0.27	0.809	6.88	1,591	0.28
ln(P_atm_exp5)	1.000	4.16	367	0.31	1.050	3.16	243	0.31	0.876	3.69	304	0.29
ln(P_itm)	-0.105	-1.99	13,700	0.35	-0.097	-1.49	11,503	0.36	-0.109	-1.90	12,450	0.35
ln(P_itm_exp)	0.481	7.60	9,418	0.29	0.585	7.07	7,413	0.29	0.405	6.61	8,191	0.28
ln(P_itm_exp5)	0.515	3.11	1,473	0.31	0.769	3.21	1,069	0.31	0.357	2.33	1,250	0.29