

*The Role of Option Markets in Shareholder Activism**

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ABSTRACT

I investigate whether financial derivative contracts such options promote or impede shareholder activism. Baseline results reveal a positive association between more liquid option markets and subsequent shareholder activism in the forms of proxy contests, shareholders proposals, or dissent voting with management. I discuss potential underlying mechanisms that channel the effect, and overall suggest that options encourage shareholder activism by facilitating the profitability of an intervention, except in the case of highly overvalued firms. Finally, using several econometric specifications and instrumental variable analysis, I claim the nature of the effect is causal.

KEYWORDS: shareholder activism, options trading, shareholder proposal, Institutional Shareholder Services (ISS).

JEL Classification: G12, G23, G30

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1 Introduction

Financial derivatives have become an intrinsic part of the modern financial world. Option markets, in particular, have experienced an exponential growth over the past decades, with total equity option volume traded in the U.S. raising from 676 million contracts in 2000 to over 3,727 million contracts in 2015 ¹. Despite the undeniable importance of these instruments, we remain unaware of their potential effects on several fronts. One pivotal example is the case of shareholder activism. Many voices have raised against the use of derivatives by large shareholders ², as these instruments facilitate the decoupling of economic and voting rights, which may incentivize individual shareholders not to act in the best interest of a firm. On the other hand, derivative markets can be seen as a good venue for trading on information, facilitating the profitability of an intervention, and, thus, increasing shareholders incentives to engage in active governance. In this paper, I tackle this issue by exploring the effect of an active equity options market on shareholder's incentives for activism. I find that more liquid option markets promote subsequent shareholder activism in various forms, including higher probability of a firm receiving a proxy contest and a shareholder proposal, as well as a larger proportion of dissent voting with management.

I start by acknowledging that any potential effect of option contracts on shareholder incentives for activism should be related to whether the derivatives market is sufficiently liquid. Not only because informed traders incentives to trade are higher in high-volume markets, but also because illiquid markets hamper uninformed traders as well (Admati and Pfleiderer, 1988; Pagano, 1989). More active option markets promote trading that induces higher stock price informativeness (Cao, 1999; Chakravarty, Gulen, and Mayhew, 2004; Pan and Poteshman, 2006) which ultimately serves as a more effective managerial discipline device (Holmström and Tirole, 1993; Dow and Gorton, 1997; Faure-Grimaud and Gromb, 2004; Chen, Goldstein, and Jiang, 2007) and makes shareholders less prone to exert direct activism (i.e. via 'voice') in favor of the 'exit' mechanism (Edmans, 2009; Admati and Pfleiderer, 2009; Edmans and Manso, 2011; Edmans, Fang, and Zur, 2013).³

¹Data from [Options Clearing Corporation](http://www.optionsclearing.com/webapps/historical-volume-query): <http://www.optionsclearing.com/webapps/historical-volume-query>.

²A clear example is the petition of the law-firm Watchell, Lipton, Rosen & Katz to the SEC on 2011, in which they pointed out the problems arising from investors using financial derivatives in their governance practices. See the complete text for the petition here: <https://www.sec.gov/rules/petitions/2011/petn4-624.pdf>.

³Following the literature I will use the term 'voice' henceforth to refer to shareholder governance exerted through direct activism, whereas the terms 'exit' or 'voting with their feet' will refer to investors exerting governance through financial markets (i.e. via the threat of selling a sizable stake in the market).

Additionally, more liquid option markets can have a detrimental effect on shareholders incentives for activism by facilitating investors' trading. For example, a large shareholder may abstain from initiating a value-enhancing intervention when the cost of selling a sizable stake in the market is reduced (Coffee, 1991; Bhide, 1993). To the extent that trading in the options market can mitigate the costs associated with price impact, investors may view options as an instrument to reduce the costs of exit. Moreover, since derivatives facilitate the decoupling of economic and voting rights, liquid option markets may exacerbate perverse empty-voting behaviour (Hu and Black, 2006, 2007). Lastly, the presence of a market for insurance may decrease investors' incentives for monitoring. Bolton and Oehmke (2011) show how, when debtholders obtain insurance against default, their monitoring efforts can be reduced as they otherwise retain control rights in and outside bankruptcy. Because option markets can also serve as insurance instruments, the presence of a more liquid options market may result in shareholders decreasing monitoring efforts.

Alternatively, an active options market can strengthen incentives for costly activism. Shareholders have the power to affect the governance of a public company through their voting rights. However, despite effective, is not often that we observe activism in practice, mainly due to its considerable costs⁴. Shareholders trade-off these costs against private benefits from intervention to decide whether to undertake an intervention. The literature identifies different channels by which shareholders' incentives for activism may be strengthened. For example, Shleifer and Vishny (1986) argue that only shareholders with large stakes have incentives to actively monitor management, as they will enjoy a higher fraction of the gains in firm value derived from intervention. In Maug (1998) and Kahn and Winton (1998) liquidity is the main mechanism that boosts shareholder intervention. When a stock is liquid enough, a shareholder planning an intervention can purchase shares at a price that does not fully reflect the future increase in firm value. Consistent with these theories, Norli, Ostergaard, and Schindele (2015) find a role of liquidity in encouraging shareholder activism. Similarly, Edmans, Fang, and Zur (2013) find an unconditional effect of liquidity on governance via voice and exit. These works support the thesis that shareholders' incentives for governance increase when they can access additional trading gains from their governance activities. Consistent with this idea, option markets can serve as an alternative venue for shareholders to gather trading

⁴Activist shareholders running a campaign incur in substantial costs including research, hiring legal expertise, or marketing a campaign. Gantchev (2013) estimates the average costs of a campaign ending in a proxy fight in \$10.71 million.

profits from activism. To the extent that liquidity eases investors trading also in the options market, more active option markets should encourage shareholder activism by increasing the potential net benefits from intervention.

Combining all these arguments together, it is apparent that the net impact of options on shareholder activism is ultimately an empirical question. In order to undertake such analysis, I conform an original and representative data set containing information on shareholder activism, voting behaviour, as well as options trading data, and firm-level characteristics for the period 2003-2014. To approximate the total annual dollar options volume I follow [Roll, Schwartz, and Subrahmanyam \(2009\)](#). I rely on several measures proposed by the literature in order to account for the level of shareholder activism in a firm, including the event of a proxy contest ([Norli, Ostergaard, and Schindele, 2015](#)), a shareholder proposal, or dissent voting with management ([Iliev, Lins, Miller, and Roth, 2015](#)).

In order to assess how options trading volume influences the probability of subsequent shareholder activism, I rely on a probit regression model similar to that in [Norli, Ostergaard, and Schindele \(2015\)](#). Specifically, I regress the conditional probability of a firm receiving a proxy contest or a shareholder proposal in year t on one and two-year lagged options dollar trading volume and a set of known determinants of activism lagged one year. The results reveal a positive association between more liquid option markets and subsequent shareholder activism. For example, an increase from the 10th to the 90th percentile in one-year lagged options volume corresponds to an increase of nearly 62% relative to the sample probability of a firm receiving a proxy contest. I then investigate the impact of an active options market on shareholder voting behavior in management-sponsored elections. Results from ordinary least-squares regression shows that in firms with a more liquid market of options for the stock, shareholders are less likely to follow management recommendations.

Whereas these findings are consistent with the thesis of option contracts stimulating shareholder activism by increasing net benefits from intervention, there are alternative explanations that may jeopardize the robustness of my results. First, I ensure that my results are robust to considering different econometric models, different measures of shareholder activism, and do not respond to differences between firms quoted and not quoted in the options market. Then, I consider the more delicate case of reverse-causality effects driving the results. This is the case if option traders are more prone to trade in those firms which they predict are more likely to experience activism. Although higher shareholder activism may associate with poor stock performance, option traders

can benefit from negative expectations over firm value (e.g., by directly purchasing puts or selling call options). Moreover, since volatility traders can exploit option markets to their advantage (Ni, Pan, and Poteshman, 2008), the mere expectation of a turbulent short-term future can be enough to induce investors to trade options more heavily in certain firms.

To mitigate concerns related to reverse-causality issues, I estimate an instrumental variable analysis via a two-staged least squares (2SLS) model. I use open interest and moneyness as instrumental variables (Roll, Schwartz, and Subrahmanyam, 2009; Blanco and Wehrheim, 2017; Blanco and García, 2017). The results from this identification strategy provide support to the notion of a significant causality running from more liquid option markets to subsequent shareholder activism in the form of proxy contest, shareholder proposal, and dissent voting with management. Overall, all these tests suggest that the positive association between trading volume in option markets and shareholder governance activities is not simply driven by self-selection.

I continue by investigating the different mechanisms that channel these results. First, I consider the role of option markets in promoting trading among shareholders. Specifically, I focus on overvalued firms. Privately informed shareholders observing a firm is highly overvalued may find optimal to exit rather than to intervene (Coffee, 1991; Bhidé, 1993). Consistent with the view of options stimulating shareholders' stock market trading, I find that the effect on shareholder activism is lower for highly overvalued firms, where the costs of intervention clearly outweigh those of exit. Second, I investigate if active option markets affect shareholder voting behavior in a way that reflects an increase in their net benefits from voting. Iliev and Lowry (2014) find that shareholders with higher net benefits from voting are less likely to rely on Institutional Shareholders Services (ISS) recommendations, and to follow the one-size-fits-all approach. Consistent with this evidence, I find that shareholders in firms with higher options trading volume are less likely to follow ISS, specially where recommendations lack any value (blanket issues). Third, I analyze the impact of options-motivated activism on firm value. Following Cuñat, Gine, and Guadalupe (2012) and Iliev and Lowry (2014), I analyze the effect of shareholder proposals on the firm abnormal return on the meeting day. I focus on proposals that pass or fail by a small margin to mitigate effects related with stock markets anticipating the results and effects on firm value of a proposal. Contrary to predictions from empty voting theories, I find no negative effect (coefficient is positive and lacks statistical significance) on stock abnormal returns for passed proposals forerun by larger options trading volume. Moreover, in the more dubious case of a shareholder proposal passed

that lacks the 'for' recommendation by ISS, higher activity in option markets associates with larger and significant abnormal stock returns. Overall, these results are consistent with the view of option markets stimulating shareholder governance by augmenting the net benefits from activism. This activism does not have, on average, perverse effects on equity value, contrary to traditional empty voting predictions.

This paper is, to the best of my knowledge, the first to empirically explore the effect of derivative markets on shareholders' incentives for activism. I contribute to several fronts in the literature. First, I add to recent work on how trading activity in options market affects corporate outcomes. The informational enhancement associated with more active option markets has been shown to lead to greater firm values (Roll, Schwartz, and Subrahmanyam, 2009), lower cost of equity financing (Naiker, Navissi, and Truong, 2013), or higher innovation quality (Blanco and Wehrheim, 2017). Additionally, Blanco and García (2017) find that more active option markets encourage shareholder decisions that are detrimental to bondholders' wealth, thus increasing the firm's cost of debt financing.

Second, I extend the literature on shareholder activism. Early work on the subject has focused on the activism of large individual shareholders (Smith, 1996; Carleton, Nelson, and Weisbach, 1998; Strickland, Wiles, and Zenner, 1996) and institutional investors (Del Guercio and Hawkins, 1999; Gillan and Starks, 2000). More recent papers focus on determinants of activism such country-specific regulation (Iliev, Lins, Miller, and Roth, 2015), or the effect to shareholder value (Cuñat, Gine, and Guadalupe, 2012). A more related branch of the literature explores the role of financial markets in affecting shareholder incentives to undertake governance activities. In this vein, stock market liquidity has received the largest attention by researchers on the theoretical (e.g., Maug, 1998; Kahn and Winton, 1998; Coffee, 1991) as well as the empirical front (e.g., Edmans, Fang, and Zur, 2013; Bharath, Jayaraman, and Nagar, 2013; Norli, Ostergaard, and Schindele, 2015).

Third, I add to recent literature exploring the impact of financial derivatives on shareholder governance. Results from these studies are mixed. While Christoffersen, Geczy, Musto, and Reed (2007) and Kalay and Pant (2009) argue that derivative markets facilitate the trading of votes from uninformed to informed investors and lead to a more efficient voting outcome, Brav and Mathews (2011) claim that these instruments may induce perverse investor behavior and exacerbate empty voting practices.

Finally, the implications drawn by this study also enrich the regulatory debate on the use of derivatives by activist shareholders. Large shareholders and activist hedge funds have incorporated derivatives to their regular practices, calling for a close regulation on

the issue. Securities and Exchange Commission (SEC) Commissioner Daniel M. Gallagher recently stated⁵ that *'derivatives and other and other synthetic forms of ownership can mask the size of the stake. As a result the purpose of the rule [Section 13 reporting obligations administered by the SEC] (...) is not being served'*. Given that the decision of option listing is made by the exchanges, which are members of the Options Clearing Corporation (OCC) under the jurisdiction of the SEC, these results are specially relevant for policy makers in general and the SEC in particular.

The remainder of this paper is organized as follows. In Section 2 I describe the research design and methodology, along with the main variables and source of data. Section 3 analyzes the baseline results and robustness issues. In Section 4 I discuss the main mechanisms that channel the effect. Finally, Section 5 concludes.

2 Data and research design

The primary focus of my research is to assess whether liquid option markets encourage shareholder activism. In other words, does higher options trading activity make shareholders more prone to exert activism?. I start by recognizing that any effect of option markets on corporate governance practices must go beyond the mere existence of a market and, rather, should be related to whether such market has sufficient volume, as incentives for informed agents to trade are higher in high-volume markets (Pagano, 1989; Admati and Pfleiderer, 1988). Consequently, I follow previous literature (Roll, Schwartz, and Subrahmanyam, 2009; Blanco and Wehrheim, 2017; Blanco and García, 2017) to define a continuous variable for option trading volume. Specifically, I construct the total annual dollar options volume for a firm by multiplying the total trade in each option by the end-of-day quote midpoint for that option and aggregate this number annually across all trading days and all options listed on the stock.

In order to assess how a more liquid options market influences the probability of subsequent shareholder activism I rely on the following probit regression model in the spirit of Norli, Ostergaard, and Schindele (2015):

$$Prob(ACT_{i,t} = 1 | OptVol_{i,t-s}, X_{i,t-1}) = \Phi(\gamma_t + \beta_1 OptVol_{i,t-s} + \beta_2 X_{i,t-1}) \quad (1)$$

⁵June 23rd, 2015, Speech on Activism, Short-termism, and the SEC: Remarks at the 21st Annual Stanford Director's College. See the complete text here: <https://www.sec.gov/news/speech/activism-short-termism-and-the-sec.html>

where i and t index firm and year, respectively. The dependent variable, $ACT_{i,t}$, equals one if firm i experiences shareholder activism on year t and zero otherwise. $\Phi()$ is the normal cumulative distribution function, $OptVol_{i,t-s}$ is the total annual dollar options trading volume as in Roll, Schwartz, and Subrahmanyam (2009) lagged s periods, γ_t accounts for time fixed-effects, and $X_{i,t-1}$ is a vector of control variables lagged one year. I also follow Norli, Ostergaard, and Schindele (2015) to define a complete set of controls. These controls include firm size, institutional ownership level, past abnormal performance, Tobins' Q, dividend yield, or analyst coverage, as well as a measure for a firm's stock liquidity. A more detailed and accurate definition of all variables can be found on Section 2.1 and Appendix A.

I define the probability of shareholder activism as the probability of a firm experiencing a *proxy contest* in year t , as in Norli, Ostergaard, and Schindele (2015). *Proxy contests* are situations in which a shareholder (or group of shareholders) disagrees with managerial proposals/decisions and require the support from other shareholders to run a dissident campaign. Although this metric is standard in the literature, proxy contests do not occur very often. For this reason, I also consider the event of a shareholder-sponsored proposal as an action of activism. *Shareholder proposals* are a costly means of activism through which investors can express their disagreement with management (e.g. by proposing directors or questioning director's pay) that have been the focus of a vast literature on shareholder governance (Karpoff, Malatesta, and Walkling, 1996; Del Guercio and Hawkins, 1999; Gillan and Starks, 2000). Because the costs of issuing a proposal for an investor are considerably lower than those of a proxy contest, these events occur more regularly. Similar to the proxy contest activism, I define an activist event based on shareholder proposals as the probability of a firm experiencing a shareholder-sponsored proposal on year t .

As a complementary measure of shareholder involvement in firm governance, I investigate whether the presence of an active options market influences shareholder voting behaviour in management-sponsored elections. Even in cases where withheld votes in a plurality voting election lack legal significance, several arguments support their validity as a channel through which shareholders can express their dissatisfaction with management. Proxy advisors such as Glass Lewis or Institutional Shareholder Services (ISS) consider withheld votes a meaningful disciplining device in uncontested elections. On the academic front, Del Guercio, Seery, and Woitke (2008) report that vote-no campaigns in director elections are associated with higher CEO turnover and subsequent operating performance. Director appointments in private offerings that lack shareholders' symbolic vote are as-

sociated with poorer firm performance and a larger degree of managerial entrenchment, as reported by [Arena and Ferris \(2007\)](#). [Cai, Garner, and Walkling \(2009\)](#) find that fewer votes in directors' elections lead to a higher probability of removing poison pills, classified boards and CEO turnover, as well as to lower CEO 'abnormal' compensation.

I follow [Cai, Garner, and Walkling \(2009\)](#) to define a measure of shareholder support to managerial proposals. Shareholders can opt among three basic choices during an election: shares can be voted for, withheld, or not voted. The base of votes for an election, as ISS and most companies define it, consist on the sum of 'for + withhold' votes. Consequently, the ratio of 'for' votes divided by 'for + withhold' constitutes a measure of shareholder support to an election. In order to get a firm-year measure, the ratio of 'for' votes is averaged across all election for firm i in year t , hence obtaining the *Average percent of "for" votes*. Because, as noted in [Cai, Garner, and Walkling \(2009\)](#), director elections may be different from others, I first calculate this measure for director elections and, then, extend the analysis to other elections, in which the voting base is constructed as specified by the company bylaws ⁶.

To assess how an active options market affects the way shareholders vote in elections I use the following regression specification defined in Eq. 2.

$$Avg. \text{ percent 'for' votes}_{i,t} = \alpha + \beta_1 OptVol_{i,t-s} + \beta_2 X_{i,t} + \gamma_t + \theta_d \quad (2)$$

where i and t index firm and year, respectively. The average percent of 'for' votes is regressed on s -period lagged annual options trading volume, $OptVol$, and a set of control variables as in [Cai, Garner, and Walkling \(2009\)](#) and defined in Section 2.1 and [Appendix A](#). γ_t and θ_d account for time and industry (4-digit Standard Industry Classification code) fixed-effects, respectively.

2.1 Data and samples

The data required for this study comes from various sources. I gather information on options trading volume from Option Metrics. This database provides with daily put and call prices and volume, as well as option strikes and expiration dates. I use Option Metrics data to construct three variables. First, I define options trading volume

⁶Although most companies also use as the base for other elections the number of for+withhold votes, depending on the type of voting some conform the base as the sum of for+against votes, as well as for+against+abstain. For those votings in which this information is available I define the voting base consequently.

(*OptVol*) as in [Roll, Schwartz, and Subrahmanyam \(2009\)](#), as the total annual dollar options volume over all options on a listed stock. Second, I construct two additional variables: *Open interest* and *Moneyness*, which I will use as instrumental variables in a two-stage least squares procedure to mitigate concerns related to endogeneity. I will define these variables in depth and discuss their validity as instruments in [Section 3.2](#). Finally, due to high skewness, I use the log-transformations of these variables (e.g. $\text{Ln}(\text{OptVol})$) for the regression analysis.

Data on shareholder activism is from Institutional Shareholder Services (ISS, formerly Risk Metrics). ISS provides detailed information on shareholder meetings and voting results for U.S. companies from 2003. This information includes, for example, the type on shareholder meeting (e.g. annual, special, etc.) which will allow me to identify those firms in which a proxy contest takes place. ISS also discloses information of the sponsor of each proposal voted, which permits the differentiation between management and shareholder initiated proposals. Finally, voting information, as well as management and ISS recommendation on each proposal is also provided by ISS.

As argued before, my core analysis is based on two different regression models, defined in [Eq.1](#) and [Eq.2](#) above, that require different control variables and, hence, data samples. I proceed now to define each of these samples, which are based on the same data on shareholder activism, options market activity, and time period, but differ in information available regarding different control variables.

2.1.1 Direct shareholder activism sample

I define various control variables following [Norli, Ostergaard, and Schindele \(2015\)](#) to account for determinants of shareholder activism in the regression model specified in [Eq. 1](#). First, I gather data from the Center for Research in Security Prices (CRSP) to construct firms stock market past performance, as bad performance is one of the main triggers of activism. Specifically, I compute $\text{Abnormal Performance}_{i,t}$ as the annual stock return on firm i minus the return of a value-weighted market index (CRSP value weighted) on year t . $\text{Volatility}_{i,t}$ is the standard deviation of monthly returns during year t . I also use CRSP data to calculate [Amihud \(2002\)](#) measure of stock market illiquidity.⁷

⁷Whereas [Norli, Ostergaard, and Schindele \(2015\)](#) use also [Hasbrouck \(2009\)](#) liquidity measure, this metric is only available until 2005. I use [Amihud \(2002\)](#) as it is widely available and standard in the literature. The results remain unchanged when using the relative bid-ask spread as a measure of stock market liquidity.

The second source of data for defining my control variables is Thomson Reuters. I gather information regarding institutional ownership holdings for firm i and year t . Using this data I define *Institutional Ownership* $_{i,t}$ as the portion of shares in hands of institutional investors over total shares outstanding (which I obtain from CRSP) and a institutional ownership Herfindahl concentration index. I also gather data on *Analyst coverage* $_{i,t}$ from the I/B/E/S database. I construct this variable by aggregating the number of analyst following a stock in year t .

Lastly, I make use of the Compustat database to obtain firm-level characteristics. I define *Nasdaq* as a dummy variable that equals one if the firm is listed on Nasdaq market, $\ln(\text{MarketCap})_{i,t}$ as the firm's end-of-December market capitalization, *Tobin's Q* $_{i,t}$ as the sum of the market capitalization of a firm's common equity (stock price times shares outstanding at the end of the quarter), liquidation value of its preferred shares and the book value of debt, divided by book value of assets. $\ln(\text{Sale})$ is the natural log of sales. *Dividend yield* $_{i,t}$ is measured as the total dividend (common and preferred) over market value of common equity plus book value of preferred equity. *Cash* $_{i,t}$ equals cash and marketable securities divided by total assets. $R\&D_{i,t}$ is research and development expenses divided by total assets. I replace missing values in R&D expenses with zeros.

The final sample comprises data from all these different sources, 33736 firm-year observations for the period 2003-2014. To be included in the final sample, I require a firm to have non-missing values on all the variables aforementioned, have at least one institutional shareholder reporting the 13F filing, and to actively report to CRSP database for at least two years.⁸ Lastly, to ensure my results are not driven by outliers and in line with standard practices in the literature, I winsorize all variables at upper and lower 0.005 percentiles. Additionally, I assign a value of zero in *Option Volume* to those firms that do not have options trading activity.⁹

Table 1 contains information on the main summary statistics of this sample. Only 0.34% of the firm-year observations experience activism. Whereas this number may seem low, it is in line with existing literature (e.g. [Norli, Ostergaard, and Schindele \(2015\)](#) hand-collected activism events add up to approximately 0.5% of the observations). The event of a shareholder proposal is significantly more frequent (8.5% of firm-year

⁸I apply these filters in order to ensure my results are not driven by selection issues or subject to back-filling biases.

⁹Firms listed in options markets are intrinsically different from those that are not ([Mayhew and Mihov, 2004](#)) and analyze them together may lead to some errors. In further analysis I deal with this problem by focusing on the sample of firms with positive options volume as I argue the effect of options markets should be related to option market activity.

observations). The rest summary statistics fall within normal values in the literature. *Options volume* for the average firm is \$78.69 million, a large number taking into account that among the 33,736 firm-year observations, 13,945 correspond to observations with an assigned value of zero for options volume (meaning the firm is not quoted in the option market in that year). When considering only firms with positive options volume the mean (median) for *Options volume* is \$134.61 millions (\$6.18). Firms in the sample are, on average, large. The average firm exhibits a *Tobin's Q* of 1.77 (1.31 for the median), is followed by 6.08 analysts (3.75 for the median) and its ownership structure is composed by more than 50% of institutional owners (55.3% for the median). Additionally, more than half of the firm-year observations refer to firms quoted in the *Nasdaq*.

[Insert Table 1 around here]

2.1.2 Dissent shareholder voting sample

Cai, Garner, and Walkling (2009) explore the firm-level determinants of election results. Following their baseline specification, I define these determinants as the set of control variables for my analysis formalized in Eq. 2. Some of these variables are common to the shareholder direct activism sample and, thus, I construct them following exactly the same procedure as described before. Common variables include Amihud (2002) illiquidity measure, natural logarithm of a firm's market capitalization, Tobin's Q, lagged stock market abnormal performance, percentage of institutional ownership, and institutional owners *Herfindahl-Hirschman* (H-H) concentration index.

Variables specific to the election sample focus on the governance structure of the firm. I gather data from the ISS (Risk Metrics) Governance database to construct several variables. To account for managerial entrenchment I use Bebchuk, Cohen, and Ferrell (2009) *E-index*. *Unequal voting dummy* is a dummy variable with value 1 if the firm has various classes of shares with unequal voting power, and 0 otherwise. *Confidential voting dummy* takes value 1 if the firm's policy prevents management from knowing how shareholders vote with their proxy cards. From ISS Directors database I withdraw information relative to *Board size*, the number of shares in hands of the board (*Board shares held*), and the percentage of the the board who are independent directors (*Independent directors*).

Using the ISS voting data, I create a dummy variable with value 1 if, in an election, ISS recommends voting 'for', and zero otherwise. *Average ISS recommendation* value corresponds to the average value of this dummy across all election in that firm-year.

Lastly, I calculate total *CEO compensation* using data from Execucomp.

[Insert Table 2 around here]

Table 2 summarizes the main descriptive statistics for this sample. A total of 10,206 firm-year observations correspond to data on all elections, from which 10,150 correspond to 'director' elections, and only 4,885 correspond to 'other' elections. Although the percentage of votes 'for' management may seem somehow large (e.g. 94.5% of average support to management in all elections), these values are close to those in the literature (e.g. Cai, Garner, and Walkling (2009) report a 93.93% of shareholders support to management). The statistics on the remaining variables are slightly different than those in the direct activism sample, making evident that firms in this sample have a larger size, as a result of the inclusion of additional control variables, for which data is not abundant. The average firm in this sample has a slightly larger *Tobin's Q* (1.84 vs. 1.77) as well as larger market capitalization (7.91 vs. 6.46 in natural logarithm terms). However, the greatest difference in the sample is in the level of institutional ownership (73.7% vs. 51.2%).

3 Baseline results

Table 3 shows the results from the baseline regression specified in Eq. 1. Columns 1 and 3 display the results from regressing $\text{Ln}(\text{OptVol})_{(t-1)}$ and the aforementioned control variables on the probability of a firm experiencing a proxy contest and a shareholder proposal, respectively, on year t . Similarly, columns 2 and 4 perform the same analysis but using $\text{Ln}(\text{OptVol})_{(t-2)}$ as an independent variable. As observed in Table 3, the coefficient of $\text{Ln}(\text{OptVol})_{(t-j)}$ is positive and highly significant (p-value<0.05 for the coefficients on probability of a proxy contest and p-value<0.01 for the probability of shareholder proposal) across all four specifications. This evidence confirms that there is a positive association between an active options market and subsequent shareholder activism. Specifically, an increase in one-year lagged options trading volume from the 10th to the 90th percentile is associated with an increase in the probability of a proxy contest (shareholder proposal) of 0.21% (3.42%). Although this number may seem low, a proxy contest is a rare event. This change of 0.21% corresponds to a change of 61.76% relative to the sample probability of activism (around 0.36%), which is in line with

previous findings in the literature.¹⁰

[Insert Table 3 around here]

The coefficients on the different control variables take the value and direction expected and are coherent with previous findings in the literature. Whereas higher liquidity, institutional ownership, dividend yield or analyst coverage positively predict shareholder activism, past performance, firm size, stock volatility or firm cash negatively associates with the probability of investors exerting governance in the form of voice.

Table 4 contains the results from the regression specification in Eq. 2. Column 1 uses the average 'for' vote in director elections as dependent variable, whereas columns 2 and 3 explore the effect on shareholder voting on 'other' and 'all' elections, respectively. The negative coefficients on one-year lagged $Ln(OptVol)$ reveal that shareholders in firms more actively traded in the options market tend to dissent from management more often. These coefficients have strong statistical significance in the three dimensions of elections considered (p-value<0.05 for director elections, p-value<0.01 for other and all elections.). Specifically, an increase of one-standard deviation in one-year lagged options volume corresponds to a decrease of 0.73 percentage points in shareholder support to management proposals. This effect is lower for director elections, but still significant, whereas is stronger for 'other' proposals, which include governance and director compensation issues, where shareholders can typically have a more direct impact on the company with their voting.

[Insert Table 4 around here]

The coefficient estimates on the remaining control variables have expected direction. Shareholders are more prone to align their votes with management when the stock is more liquid, the firm is larger, past performance has been positive, governance quality of the firm is stronger, and ISS recommends voting 'for'. On the other hand, shareholders tend to withdraw their support to management when the CEO is heavily compensated, and the firm has higher and less concentrated institutional ownership.

Taken together, these first results point at options trading volume being related to a stronger shareholder attitude towards activism. However, even I carefully introduce

¹⁰Norli, Ostergaard, and Schindele (2015) report an effect of liquidity relative to the sample probability of activism of 71.2%.

control variables, and measure options trading one year before the activist event, I cannot, so far, argue a causal effect of option markets on shareholder governance via voice or voting behaviour. It may be that, for example, investors are more prone to trade options over firms that have historically more active shareholder governance. I analyze this endogeneity problem, as well as other issues related to the robustness of the results in the next sections.

3.1 Firms with positive options volume

So far I have explored the effect of option markets on shareholder governance over an universe of firms that include both companies traded in the options market, as well as firms not quoted on the options market. As [Mayhew and Mihov \(2004\)](#) point out, exchanges use a different set of criteria to decide whether to quote a firm in the options market, although the decision is ultimately discretionary. Consequently, even though I control for a set of known determinants of access to options market such liquidity or firm size, companies in my sample that do have options trading activity may be inherently different from those that do not in some unobservable characteristic.

To mitigate concerns related to these potential omitted variable bias, I repeat the probit and OLS regression specifications in Eq. 1 and 2, respectively, for the subsample of observations with positive options trading volume. The results from the direct activism sample are in Table 5. Columns 1 and 2 use the probability of a proxy contest as a dependent variable for one-year and two-year lagged options volume, respectively, whereas columns 3 and 4 use the probability of a shareholder proposal as a signal of activism for one and two-years lagged option trading activity as well. Overall, the results confirm previous findings. Furthermore, one-year lagged options volume has a significant larger effect than in the previous specification. Specifically, an increase in options activity from the 10th to the 90th percentiles now associates with a 82.63% change in the likelihood of receiving a proxy contest relative to the sample probability. Surprisingly, the probability of a firm receiving a shareholder proposal loses statistical significance for the case of one-year lagged options volume, although the coefficient remains highly statistically significant (p -value<0.01) for the two-year-lagged options volume. I explore this finding in detail when I investigate the endogeneity of the effect in a forward section.

[Insert Table 5 around here]

Table 6 contains the results of the OLS specification for the shareholder voting sample. Similarly to the previous case, despite losing some observations corresponding to firms not quoted on the option market, coefficients for options trading volume remain strong statistically with slight increases in their economic magnitude. For example, the coefficient on $\text{Ln}(\text{Optvol})_{t-1}$ for all elections changes from -0.114 to -0.130. These results are in line with the prior of a beneficial effect of option markets on activism coming from the liquidity of the market rather than solely from whether it exists.

[Insert Table 6 around here]

3.2 Endogeneity

Having established that more active options markets are associated with higher shareholder activism and dissent voting, I turn now to explore possible biases in my results due to endogeneity or reverse causality. I mitigate these concerns by using an instrumental variable (IV) approach with a two-staged least squares (2SLS) regression model. The use of instrumental variables carries several benefits for assessing validity to my results. It will not only help with reverse-causality concerns, but also mitigate biases due to measurement error and omitted variables. Note that, because the construction of these instruments is only possible for firms with positive options trading volume, the instrumental variable analysis is restricted to those firm-year observations with positive options trading activity.¹¹

A good instrument for my setting is a variable that is highly correlated with options volume (relevance condition), but uncorrelated with the probability of shareholder activism except through other independent variables (exclusion restriction). I make use of two good instruments used before in the literature (Roll, Schwartz, and Subrahmanyam, 2009; Blanco and Wehrheim, 2017; Blanco and García, 2017). The first is open interest, which consists on the total number of put and call contracts that remain open on a given stock. I average this daily number (provided by Option Metrics) annually to construct Open interest_t . As shown by a correlation of 0.648, it is clear that this variable strongly relates to option volume (I provide results from the first stage regression on Appendix B). Moreover, as this number contains the sum of call and put contracts, it should not

¹¹This restriction, however, should not pose a problem, since my hypothesis predicts the effect to be related to the liquidity of the options market rather to its mere existence.

be linked to higher or lower firm quality (Roll, Schwartz, and Subrahmanyam, 2009) or activism level in any mechanical way.¹²

Table 7 displays the result of the 2SLS regression on the probability of a firm experiencing a proxy contest or a shareholder proposal using the natural log of open interest, $Ln(Open\ Interest)$, as an instrument and the full set of time dummies and independent variables from Eq 1. Coefficients for the instrumented $Ln(Opt\ Vol)_{(t-1)}$ are highly significant (p-value<0.01) for both the probability of proxy contest and of shareholder proposal (columns 1 and 3, respectively). For the case of instrumented $Ln(Opt\ Vol)_{(t-2)}$, statistical significance remains high for the probability of shareholder proposal (column 4) but p-values increase for the probability of proxy contest (column 2) although coefficient remains statistically significant at 10% level. The economic magnitude of the coefficients in the 2SLS is larger than for the baseline probit results, indicating that the main effect of options on the probability of activism suffers from downward bias and therefore the true coefficient is larger.¹³

[Insert Table 7 around here]

Similarly, Table 8 shows the results of performing a 2SLS regression on the shareholder voting sample. Coefficients on instrumented one-year lagged options volume, $Ln(Opt\ Vol)_{(t-1)}$, are strongly significant (p-value<0.01) for the three specified elections. Again, economic magnitudes of the effects are quite larger than in the baseline case, pointing at the downward bias of the OLS coefficient also suggested by the probit regressions.

[Insert Table 8 around here]

The second instrument I use is *Moneyness*. I calculate moneyness as in Roll, Schwartz, and Subrahmanyam (2009) (i.e. the average absolute difference between the stock's market price and the option's strike price aggregated across all options on a stock and

¹²Higher or lower values of call or put contracts may correspond to better or poorer firm quality that may trigger shareholder activism, but not the sum of both option contracts.

¹³Discrepancies between 2SLS and OLS coefficients are normal and arise due to several factor related primarily with the mitigation of errors-in-variables biases. A comprehensive analysis of the relevant econometric issues on this topic can be found in Beaver, McNally, and Stinson (1997) or Irwin and Terviö (2002).

averaged annually). Because different agents seek options with different strikes (e.g. volatility speculators would choose deep in-the-money options as their vega is close to zero, informed agents may trade out-of-the-money options that provide higher leverage, and uninformed traders would select less risky positions through at-the money options) and exchanges tend to list new options with strikes close to current stock price, there is no reason to expect that (unsigned) moneyness is directly related to firm quality or the probability of shareholder activism. However, the relevance condition is not as strong as with open interest. While the correlation between this variable and options volume is sufficiently strong prior to the financial crisis of 2007 (around 0.2), it has decreased dramatically since then. Throughout my whole sample period (2003-2014) the correlation of moneyness with options volume is just 0.03, suggesting that this instrument may not be as strong as open interest when I include more recent and financially unstable years. Tables B1 and B2 in Appendix B provide the results of the 2SLS model using moneyness and open interest together as instruments for the direct activism and the shareholder voting samples, respectively. Results confirm the direction and significance of the effect for the baseline probit and OLS models.

Taken together, these results are consistent with the notion of a significant causality running from option markets to subsequent shareholder activism. Moreover, using an instrumental variable regression to mitigate biases yields a larger magnitude of the coefficients, revealing a stronger economic significance of the effect.

3.3 Number of activist events

So far I have defined the event of activism by a shareholder as the probability of firm i experiencing either a proxy contest or a shareholder proposal in year t . This metric, however, does not disentangle firms experiencing several activism events a year from those that suffer only one. Nonetheless, if active options markets truly encourage shareholder governance in the form of voice, investors in stocks with more actively traded options should be more prone to exert governance efforts resulting in a higher number of activist events. In this section I deal with this issue by exploring the effect of option market liquidity on the number of proxy contests and shareholder proposals experienced by a firm in a given year. Using the same direct shareholder activism sample as before, I run the regression specified in Eq. 3 under three different models: ordinary least squares, Poisson, and negative binomial.

$$\# \text{ Activism events} = \gamma_t + \beta_1 \text{Ln}(\text{OptVol})_{i,t-1} + \beta_2 X_{i,t-1} \quad (3)$$

where γ_t accounts for time fixed effects, $X_{i,t-1}$ contains the same vector of control variables used in the baseline probit regressions, and $\text{Ln}(\text{OptVol})_{i,t-1}$ measures option market activity. Table 9 displays the results of this regression specification. Columns 1 to 3 use the number of proxy contests received by a firm in a given year as a dependent variable, whereas columns 4 to 6 use the number of proposals registered by shareholders. Because of the nature of the data, I extend the classic OLS specification (in columns 1 and 4) to include Poisson (columns 2 and 5) and negative binomial (columns 3 and 6) regression estimation. Coefficients for $\text{Ln}(\text{OptVol})_{i,t-1}$ across all specifications have high statistical significance (p-value<0.01, except for the OLS regression on the number of proxy contests with p-value<0.05) and positive sign, supporting the notion of liquid options market encouraging several shareholder activism events.

[Insert Table 9 around here]

4 Possible mechanisms

Having explored the robustness of the effect on various dimensions, I turn now to disentangle the possible mechanisms by which liquid option markets encourage shareholder activism. My main hypothesis argues that active option markets make shareholders more prone to activism by increasing the net benefits from intervention and voting. This is, because options allow investors to access extra trading gains, while the costs associated with activism (e.g., research) remain equal, shareholders' incentives to seek value-increasing projects for the firm increase. Whereas observing this is impossible in practice, I can analyze the effect of options in several situations in which my hypothesis has clear predictions. Providing definite proof is, of course, challenging and hence my tests are only suggestive.

I start by considering the role of options in promoting trading among investors. Similar to the effect of liquidity in theories like [Kahn and Winton \(1998\)](#) if options markets truly

facilitate investors trading¹⁴, their positive impact on shareholder activism should be lower (even negative) in cases where investors' incentives to exit clearly outweigh potential gains from intervention. One specific example of such a case are overvalued firms. When a firm is highly overvalued, a privately informed investor observing the firm is overvalued may find optimal to exit the firm and abstain from initiating a value-enhancing (but costly) intervention.

Next, I investigate the influence of options toward shareholder voting behaviour. Shareholders dedicate effort to research a proposal based on their net benefits from voting (Iliev and Lowry, 2014). This is, as shareholders have higher incentives to become privately informed about firm fundamentals, they will assess the effect of a proposal for firm value with higher accuracy. Consistent with my hypothesis of options serving as a venue for additional gains from private information, the presence of an active options market should motivate more active shareholder voting behaviour.

Lastly, I focus on the stock market reaction to shareholders proposals forerun by larger options trading volume. So far, my results point at shareholders using option markets as an alternative trading venue. However, trading in two markets that allow for taking opposite positions in each other facilitates the decoupling of voting and economic interests for shareholders. This, in turn, can promote empty voting behaviour that leads to value-decreasing activities for the firm. I evaluate whether shareholder proposals motivated by larger trading in option markets lead to higher or lower subsequent stock prices. Specifically, to mitigate concerns related to stock market anticipation of a pass of the proposal, I focus on those proposals that pass or fail by a small margin (Cuñat, Gine, and Guadalupe, 2012).

4.1 Direct activism in overvalued firms

Firm overvaluation is impossible to observe with precision. However, extensive literature supports the validity of proxies that build on the theories by Miller (1977) and Harrison and Kreps (1978), which point to short-sale constraints and difference of opinion as determinants of firm overvaluation. As argued by Nagel (2005), stocks with low institutional ownership tend to have more sparse loan supply. Similarly, I follow Baker and Wurgler (2007) and use stock return volatility as a proxy for difference of opinion.

¹⁴Notice that by facilitating investor trading I refer to both initiating a new position, as well as exiting an existing one. For example, investors may mitigate the harmful effect of price impact when selling a large stake by trading on derivative markets.

Consequently, I define two measures that proxy for firm overvaluation: $\ln(1/Institutional\ Ownership)$ and the standard deviation of monthly stock returns over one year ($Volatility$), as in [Norli, Ostergaard, and Schindele \(2015\)](#). Table 10 contains the results of interacting these two variables with options trading volume.

[Insert Table 10 around here]

Columns 1 and 3 in Table 10 contain the results from the probit regression in Eq. 1 and the interaction term of options volume, $\ln(OptVol)_{t-2}$, and the overvaluation proxy, $\ln(1/Inst.Own)_{t-1}$, for the probability of a firm experiencing a proxy contest and a shareholder proposal, respectively. Columns 2 and 4 include the same analysis, but using $Volatility_{t-1}$ as a proxy for firm overvaluation. As shown by the negative coefficients resulting from the interactions with firm overvaluation proxies, the effect of options trading volume on shareholder activism is lower for highly overvalued stocks. Although when computing the average interaction effect it is not statistically significant for the event of a proxy contest (although still negative), it remains highly significant ($p\text{-value}<0.01$) for the case of shareholder proposal.

In sum, these results are consistent with the notion of options trading volume easing investors trading activities, which facilitates exit rather than intervention when a firm is highly overvalued.

4.2 Active shareholder voting

Shareholders do not always have the incentives to perform a deep assessment of all the different proposals available for voting in meetings. Because the allocation of resources to research the effects and consequences of each agenda item is limited, it is not surprising that an industry has grown to service this requirement. Proxy advisory firms gather information about millions of companies and provide with voting recommendations for each item on the voting agenda. The increasing use of this recommendations by shareholders has motivated a deeper study of the behaviour of proxy advisers, which have been widely accused of issuing arbitrary guidance. [Iliev and Lowry \(2014\)](#) study the use of ISS (a well-known proxy adviser) services by mutual fund shareholders. Their results link shareholder voting behavior to their net benefits from voting. Mutual funds with higher net benefits of voting are less likely to rely on ISS recommendations and follow

one-size-fits-all approach. Moreover, these funds that vote more actively earn a higher risk-adjusted return from their investments. Additionally, [Coles, Daniel, and Naveen \(2006\)](#) and [Johnson, Karpoff, and Yi \(2015\)](#) emphasize how the one-size-fits-all approach is unlikely to be optimal for firm governance.

In order to investigate whether the presence of an active options market is related to increasing benefits from active governance, I study how likely are shareholders to vote in line with ISS recommendations when the firm has larger options trading activity. With this aim, and making use of the shareholder voting data used before, I construct a variable, *Average vote with ISS (%)*, that measures the degree in which shareholder votes align with ISS recommendation. Specifically, this variable accounts for the average percentage of votes following ISS recommendation over the voting base, in a similar fashion to the *Average vote for management* variable used before. Using this metric as a measure for shareholder support to ISS guidance I run the following regression model, similar to that of Eq. 2:

$$Avg. \text{ vote with ISS } (\%)_{i,t} = \alpha + \beta_1 Ln(OptVol)_{i,t-s} + \beta_2 X_{i,t} + \gamma_t + \theta_d \quad (4)$$

where i and t index firm and year, respectively. The average percent of votes with ISS is regressed on s -period lagged annual options trading volume, and a set of control variables, as well as time (γ_t) and industry (θ_d) fixed-effects. The set of control variables is exactly the same in Eq. 2 (and defined in [Appendix A](#)), with the exception of *Average ISS recommendation*, which is now substituted by *Average management recommendation*.

[Insert Table 11 around here]

Columns 1 and 2 in [Table 11](#) contain the result from this regression for contemporaneous and one-year lagged options volume, respectively. As evidenced by the negative and highly significant (p -value<0.01) coefficients of -0.270 and -0.291, shareholders in firms with more active options markets are less likely to follow the passive approach from ISS.

Taken together, these results are in line with the conjecture of options increasing shareholders net benefits from active governance. When there exists a liquid option market that shareholders can exploit to their own trading gains, they are more likely to dedicate higher efforts to the assessment of proposals, which, ultimately, results in more active governance.

4.2.1 Blanket recommendations

While voting patterns different to those of ISS evidence active efforts from shareholders to assess the value of a proposal, there are specific issues in which voting against ISS is specially relevant. ISS has been repeatedly accused of issuing empty recommendations in an effort to minimize costs. In these so-called blanket recommendations, ISS always recommends against certain issues without considering the specifics of the company. If options truly make shareholders more prone to active activism, shareholder support to ISS recommendations should be specially low when the firm has a more active options trading volume and the percentage of blanket recommendations in the agenda is higher.

In order to identify those blanket (or near-blanket) recommendations by ISS I follow the approach in [Iliev and Lowry \(2014\)](#). Specifically, I focus on the agenda items with lowest historical support of ISS to management. I obtain five different issues in which ISS always (or nearly always) recommends voting against management. These issues are proposals to *declassify the board of directors*, *require majority vote for an election of directors*, *stock retention*, *advisory vote to ratify executive's compensation* and *double trigger on equity plans*. The first four issues are also considered as blanket in [Iliev and Lowry \(2014\)](#) analysis¹⁵, consistent with ISS consistently issuing blanket recommendations in the same items. Next, I calculate the average number of blanket recommendations, *Avg. ISS Blanket Rec*, per firm and year. A larger value of this variable indicates that a higher proportion of the issues voted on that year were affected by blanket recommendations from ISS.

Columns 3 and 4 in [Table 11](#) display the results of the regression in [Eq. 4](#), but this time including the results from incorporating an interaction term between the average number of blanket recommendations and contemporaneous and one-year-lagged options volume, respectively. Coefficients for the interaction terms are negative (-0.025 and -0.021) and statistically significant (p -value<0.05 and p -value<0.1). The coefficients on options volume remain highly significant and negative.

Overall, these results are consistent with the view of option markets enhancing shareholder incentives for active governance by increasing net benefits from activism.

¹⁵Excluding the last issue from the blanket classification does not change the nature of the results.

4.3 Stock market reaction to proposals

Lastly, I investigate the stock market reaction to shareholder proposals preceded by larger options trading volume. The intuition behind this analysis is the following. While option markets seem to encourage shareholder proposals and activism, it is not clear that such activism has always value-increasing goals. One specific concern is that more active option markets promote empty voting behavior among investors. When shareholders are able to separate economic from voting interests in a firm, as a more liquid options market enables, their incentives to undertake value-increasing projects for the firm may be undermined. For example, a large shareholder may tilt the result of a vote on a positive firm-value issue towards 'No' because his economic interest is placed on lower future firm value (e.g., by being long on put options).

Cuñat, Gine, and Guadalupe (2012) study stock market reactions to governance proposals that pass or fail by a small margin (5%). Because stock markets may discount the effect of proposals that have high expectations of pass or fail by a large margin, this identification allows for a cleaner causal estimate. They find that passing a proposal leads to positive abnormal returns, specially in firms with more anti-takeover provisions and higher institutional ownership. Additionally, Iliev and Lowry (2014) investigate how the presence of more active voting influences the stock market reaction to a shareholder proposal. Shareholder proposals that are supported by more active voting have larger (lower) abnormal returns when they pass (fail).

In order to assess whether option markets promote empty voting behavior by shareholders I analyze the effect of options trading volume, $Ln(OptVol)$, on firm abnormal returns for shareholder proposals that pass or fail by a close margin. I calculate options trading volume for the quarter prior to that of the voting. I follow Cuñat, Gine, and Guadalupe (2012) and Iliev and Lowry (2014), and define close votes on proposals as those that pass or fail by a margin of five percent or less. Overall, I identify 518 cases in which a firm has a shareholder proposal that passes or fails by a small margin. Following the literature, I compute the abnormal return on the meeting day the proposal is voted as the alpha from the Fama-French four-factor model. I also create two dummy variables that equal one if the proposal is passed, *Pass dummy*, and if the ISS recommendation is 'For', *ISS rec. 'For'*, and zero otherwise. Using this set of variables, I proceed to investigate the stock market reaction to proposals forerun by larger options trading volume.

[Insert Table 12 around here]

Table 12 contains the results from two different regression models. In column 1, abnormal returns are regressed on options volume, $Ln(OptVol)$, a *Pass dummy*, the interaction of these two, and the *ISS recommend 'For'* dummy. The coefficient on the interaction term, $Ln(OptVol) \times Pass\ dummy$, is positive (0.052) but exhibits no statistical significance at conventional levels. While this result discards, on average, any harmful effect on equity values from the pass of proposals preceded by larger options volume, it deserves more attention.

Motivated by previous results that point to more active option markets inducing shareholders to disagree more often with ISS, I extend the previous regression model by incorporating the triple interaction term of options volume, $Ln(OptVol)$, *Pass dummy*, and *ISS recommend 'For'* dummy. Intuitively, if options promote shareholder empty voting behavior, this should manifest strongly in those proposals where ISS does not recommend in favor. These results are shown in column 2 in Table 12. Notice that now, the coefficient on $Ln(OptVol) \times Pass\ dummy$, corresponds to the effect of options volume on abnormal returns when a proposal passed and ISS did not recommend 'For'.¹⁶ Alternatively, the interaction term $Ln(OptVol) \times Pass\ dummy \times ISS\ rec.\ 'For'$ corresponds to the effect of options trading on abnormal returns for proposals passed and recommended 'For' by ISS. As evidenced by the positive and significant (p -value <0.05) coefficient of 0.567, higher options trading volume prior to the meeting associates with larger abnormal returns on the meeting day when ISS does not recommend in favor of the passed proposal. However, this situation is reversed when ISS recommends 'For' a proposal. The coefficient on the triple interaction is negative and statistically significant (p -value <0.05) with a smaller magnitude (-0.520).

These results are not consistent with the view that more active option markets, on average, promote empty voting behavior by investors. Options trading volume impacts positively abnormal returns when a proposal in which ISS is not in favor is passed, which provides compelling evidence against the empty voting argument. It is puzzling, though, that when ISS recommends for a proposal and it is passed, more active options markets associate with lower abnormal returns. One potential explanation for this negative association may lie in the higher ability of stock markets to predict the impact on firm value of a proposal when it is recommended by ISS, and therefore investors expectations may be already incorporated into prices.

Overall, larger trading activity in options market does not have a significant effect

¹⁶By construction, the ISS recommendation variable takes values zero or one. However, a value of zero does not automatically mean that ISS recommended against the proposal.

(neither positive nor negative) on firm value when a shareholder proposal is passed. While this (lack of) effect refers to the average shareholder proposal, unveiling the specific situations in which this effect takes one direction or the other constitutes an interesting and important venue for future research.

5 Discussion and conclusion

Derivative contracts have reached a substantial importance in the contemporary financial world. Despite their first-order use among investors worldwide, their effects have been hardly studied from a corporate perspective. With this paper, I contribute to fill this gap in the literature by studying the real effects of option markets on shareholder activism. I find that higher trading volume in option markets leads to stronger subsequent shareholder activism. This activism manifests in higher probability and larger number of proxy contests and shareholder proposals in meetings, as well as in the form of dissent voting with management.

These results challenge the view that higher price informativeness, conveyed by more liquid option markets, always reduce shareholder incentives for governance in the form of 'voice' in favor of the 'exit' mechanism. Liquid option markets encourage activism in the form of 'voice' even after controlling for the degree of information asymmetries in a firm, as proxied by analyst coverage. However, I do not argue that the informational enhancement embedded in liquid option markets does not play a role. In particular, the 'exit' mechanism may dominate in specific scenarios, such as in the case of highly overvalued firms.

To the extent that the presence of an active market for options over the stock facilitates investors trading, my results resemble those of [Norli, Ostergaard, and Schindele \(2015\)](#) on the role of stock liquidity on shareholder activism. Nonetheless, I show that option markets have an effect on activism beyond that of stock liquidity. I further discuss the mechanisms behind these results and provide suggestive evidence that points to investors using option markets to gather additional trading gains from their information, which, ultimately, results in higher net benefits from activism. The presence of a more liquid options market induces shareholders to take a stronger attitude towards activism, which manifests in lower reliance on ISS voting recommendations, specially in blanket issues ([Iliev and Lowry, 2014](#)).

Lastly, motivated by growing concerns regarding the use of derivatives by investors

to decouple economic and control rights, I study the effects on firm value of proposals forerun by larger activity in option markets. While empty voting theories predict that when investors have the ability to separate voting and economic interests their proposals may be detrimental to firm value, I do not find any significant effect on stocks abnormal returns when a proposal preceded by larger options trading volume is passed. Moreover, when a proposal in which the ISS is not in favor is passed, larger activity in option markets associates with higher abnormal equity returns.

Overall, this paper provides novel insights for the ongoing debate on derivatives regulation. Because, opposite to the case of stock market listing, exchanges make the exogenous decision of option market listing, the conclusions drawn by this study are highly relevant not only on the academic front, but from a regulatory perspective. I show that, on average, the positive impact (by stimulating) of option markets on shareholder activism outweighs the perverse effect associated with providing increasing incentives to shareholders for speculative trading and empty voting. However, I do not conclude that investors do not find option markets as a good trading venue that promotes empty voting behavior under certain conditions. Unveiling which are these conditions and how to prevent detrimental situations to firm value from happening are particularly important and interesting venues for future research.

Tables and figures

Table 1: Summary statistics: Direct activism

	Mean	StdDev	25%	Median	75%	Observations
Proxy Contest	0.0034	0.059	0.000	0.000	0.000	33736
Shareholder Proposal	0.0855	0.280	0.000	0.000	0.000	33736
Options Volume _(t-1) (\$millions)	78.692	347.545	0.000	0.356	10.660	33736
Ln(Mkt Cap) _(t-1)	6.462	2.093	4.959	6.321	7.864	33736
Tobin's Q _(t-1)	1.777	1.358	1.035	1.312	1.970	33736
Ln(Sales) _(t-1)	6.108	2.177	4.540	5.998	7.578	33736
Dividend yield _(t-1)	0.017	0.027	0.000	0.004	0.024	33736
Cash _(t-1)	0.117	0.143	0.020	0.061	0.162	33736
R&D _(t-1)	0.035	0.089	0.000	0.000	0.030	33736
Nasdaq _(t-1)	0.528	0.499	0.000	1.000	1.000	33736
Illiquidity _(t-1)	-0.103	4.530	0.001	0.006	0.065	33736
Volatility _(t-1)	0.115	0.078	0.065	0.097	0.143	33736
Ab. Performance _(t-1)	0.009	0.038	-0.010	0.006	0.025	33736
Ab. Performance _(t-2)	0.012	0.044	-0.010	0.008	0.028	33736
Institutional HHI _(t-1)	0.130	0.155	0.044	0.071	0.146	33736
Institutional Ownership _(t-1)	0.512	0.289	0.260	0.553	0.767	33736
Analyst Coverage _(t-1)	6.085	6.741	1.000	3.750	8.750	33736

Notes: This table presents the summary statistics for the variables in the direct activism sample. Definitions of all variables are provided in [Appendix A](#). The sample period is 2003-2014.

Table 2: Summary statistics: Voting sample

	Mean	StdDev	25%	Median	75%	Observations
Avg. vote for management (%)						
Directors elections	95.309	6.934	94.834	97.424	98.893	10150
Other elections	92.819	8.679	89.876	95.860	98.322	4885
All elections	94.518	6.345	93.100	96.394	98.171	10206
Options Volume (\$millions)	176.519	524.961	0.900	8.165	72.894	12173
Ln(Mkt Cap)	7.909	1.522	6.779	7.765	8.922	12173
Illiquidity	-0.021	1.316	0.000	0.001	0.003	12173
Tobin's Q	1.845	1.130	1.118	1.481	2.146	12173
Ab. Performance	0.008	0.026	-0.007	0.006	0.021	12173
E-Index	2.859	1.286	2.000	3.000	4.000	12173
CEO compensation	0.570	0.719	0.161	0.347	0.732	12173
Board size	9.519	2.450	8.000	9.000	11.000	12173
Board shares held	74.656	141.054	9.624	25.529	80.591	12173
Independent directors(%)	0.761	0.128	0.667	0.778	0.875	12173
Avg. ISS recommendation	0.911	0.176	0.889	1.000	1.000	12173
Unequal voting dummy	0.031	0.173	0.000	0.000	0.000	12173
Confidential voting dummy	0.131	0.337	0.000	0.000	0.000	12173
Institutional HHI	0.048	0.025	0.033	0.043	0.056	12173
Institutional Ownership	0.737	0.150	0.643	0.756	0.853	12173

Notes: This table presents the summary statistics for the variables in the shareholder voting sample. Definitions of all variables are provided in [Appendix A](#). The sample period is 2003-2014.

Table 3: Options Volume and Activism

	Proxy Contest _t		Shareholder Proposal _t	
	(1)	(2)	(3)	(4)
Ln(OptVol) _(t-1)	0.055** (0.021)		0.087*** (0.010)	
Ln(OptVol) _(t-2)		0.050** (0.022)		0.089*** (0.009)
Ln(Illiquidity) _(t-1)	-0.075* (0.041)	-0.080* (0.042)	-0.131*** (0.019)	-0.135*** (0.019)
Ab. Performance _(t-1)	-0.597 (0.971)	-0.414 (0.982)	0.267 (0.507)	0.730 (0.506)
Ab. Performance _(t-2)	-2.204*** (0.852)	-1.905** (0.843)	-3.216*** (0.450)	-2.652*** (0.444)
Institutional HHI _(t-1)	-0.453 (0.318)	-0.410 (0.313)	-0.032 (0.208)	-0.021 (0.208)
Institutional Ownership _(t-1)	0.730*** (0.160)	0.715*** (0.161)	0.488*** (0.069)	0.486*** (0.069)
Analyst Coverage _(t-1)	-0.004 (0.008)	-0.003 (0.008)	0.015*** (0.002)	0.014*** (0.002)
Volatility _(t-1)	-0.256 (0.517)	-0.213 (0.496)	-1.750*** (0.358)	-1.685*** (0.340)
Nasdaq _(t-1)	0.079 (0.078)	0.076 (0.078)	-0.012 (0.034)	-0.016 (0.034)
Ln(Mkt Cap) _(t-1)	-0.243*** (0.057)	-0.244*** (0.058)	-0.092*** (0.024)	-0.096*** (0.024)
Tobin's Q _(t-1)	-0.056 (0.042)	-0.051 (0.042)	-0.008 (0.016)	-0.005 (0.016)
Ln(Sales) _(t-1)	0.034 (0.032)	0.035 (0.032)	0.193*** (0.018)	0.194*** (0.018)
Dividend yield _(t-1)	0.967 (1.013)	1.025 (1.016)	2.672*** (0.451)	2.858*** (0.451)
Cash _(t-1)	0.182 (0.269)	0.162 (0.269)	-0.663*** (0.166)	-0.698*** (0.167)
R&D _(t-1)	0.053 (0.396)	0.073 (0.395)	0.193 (0.440)	0.169 (0.443)
Observations	33736	33736	33736	33736
Pseudo R ²	0.074	0.074	0.323	0.323
Change in probability of activism when OptVol is increased from 10th to 90th perc. (marginal eff. at means). (p-value Wald diff test)	0.21% (0.03)	0.18% (0.05)	3.42% (0.00)	3.38% (0.00)
Change relative to sample probability of activism	61.76%	52.94%	40.01%	39.51%

Notes: This table presents probit regression estimates of firm-level shareholder activism events (proxy contest and shareholder proposal) on one and two-year lagged options volume and a set of determinants of shareholder activism. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 4: Voting with management

	Average Vote for Management (%)		
	Directors	Other	All
	(1)	(2)	(3)
$\text{Ln}(\text{OptVol})_{(t-1)}$	-0.072** (0.035)	-0.242*** (0.077)	-0.114*** (0.034)
Illiquidity	-0.053*** (0.016)	-0.031 (0.022)	-0.042*** (0.015)
$\text{Ln}(\text{Mkt Cap})$	0.460*** (0.068)	0.962*** (0.184)	0.531*** (0.073)
Tobin's Q	0.162*** (0.060)	0.120 (0.158)	0.164** (0.064)
Ab. Performance $_{(t-1)}$	6.206*** (2.058)	-6.476 (7.073)	3.384 (3.032)
E-Index	-0.394*** (0.052)	-0.150 (0.137)	-0.543*** (0.059)
CEO compensation (\$ thousands)	-0.191** (0.078)	-1.345*** (0.235)	-0.423*** (0.077)
Board size	0.063** (0.031)	0.030 (0.073)	0.092*** (0.032)
Board shares held	0.003*** (0.001)	0.004*** (0.001)	0.005*** (0.001)
Independent directors(%)	2.729*** (0.581)	-0.852 (1.266)	1.701*** (0.557)
Avg. ISS Recommen.	23.493*** (0.614)	11.187*** (1.096)	22.269*** (0.636)
Unequal voting dummy	1.742*** (0.390)	2.108** (1.020)	1.174* (0.605)
Confidential voting dummy	-0.080 (0.149)	-0.223 (0.350)	-0.167 (0.162)
Institutional HHI	8.520*** (2.612)	25.608*** (6.888)	10.867*** (2.577)
Institutional Ownership	-0.951** (0.464)	-0.594 (1.152)	-0.570 (0.455)
Observations	10150	4885	10206
Adjusted R^2	0.585	0.119	0.408

Notes: This table presents OLS regression estimates of the average shareholder vote for management-sponsored proposals on one-year lagged options volume and a set of known determinants of shareholder support to management. Column 1 contains the results for proposals on Directors, column 2 for Other proposals, and column 3 for All proposals. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year and industry (four-digit sic code) dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 5: Options Volume and Activism: Firms with positive Options volume

	Proxy Contest _t		Shareholder Proposal _t	
	(1)	(2)	(3)	(4)
Ln(OptVol) _(t-1)	0.060** (0.025)		0.017 (0.012)	
Ln(OptVol) _(t-2)		0.044* (0.025)		0.032*** (0.011)
Ln(Illiquidity) _(t-1)	-0.027 (0.053)	-0.054 (0.060)	-0.266*** (0.038)	-0.250*** (0.035)
Ab. Performance _(t-1)	-1.847 (1.230)	-1.567 (1.347)	0.339 (0.590)	0.285 (0.607)
Ab. Performance _(t-2)	-3.663*** (1.146)	-3.147*** (1.174)	-3.261*** (0.555)	-3.034*** (0.555)
Institutional HHI _(t-1)	-1.245 (0.853)	-1.088 (0.812)	-0.978** (0.435)	-1.367*** (0.404)
Institutional Ownership _(t-1)	0.845*** (0.202)	0.809*** (0.214)	0.754*** (0.096)	0.799*** (0.098)
Analyst Coverage _(t-1)	-0.007 (0.008)	-0.007 (0.008)	0.009*** (0.003)	0.008*** (0.003)
Volatility _(t-1)	-0.162 (0.768)	0.007 (0.680)	0.011 (0.411)	-0.129 (0.399)
Nasdaq _(t-1)	0.077 (0.098)	0.102 (0.099)	-0.022 (0.040)	-0.037 (0.040)
Ln(Mkt Cap) _(t-1)	-0.207*** (0.067)	-0.224*** (0.073)	-0.088*** (0.034)	-0.088*** (0.034)
Tobin's Q _(t-1)	-0.037 (0.048)	-0.021 (0.046)	0.004 (0.018)	0.003 (0.018)
Ln(Sales) _(t-1)	0.057 (0.037)	0.065* (0.039)	0.229*** (0.023)	0.231*** (0.023)
Dividend yield _(t-1)	1.681* (1.014)	1.307 (1.086)	3.590*** (0.546)	3.978*** (0.567)
Cash _(t-1)	0.001 (0.356)	-0.015 (0.357)	-0.503*** (0.183)	-0.498*** (0.183)
R&D _(t-1)	0.280 (0.453)	0.213 (0.463)	0.523 (0.464)	0.557 (0.460)
Observations	19791	18689	19791	18689
Pseudo R ²	0.074	0.072	0.289	0.287
Change in probability of activism when OptVol is increased from 10th to 90th perc. (marginal eff. at means) (p-value)	0.34% (0.03)	0.28% (0.07)	1.30% (0.22)	3.18% (0.00)
Change relative to sample probability of activism	82.63%	67.08%	9.55%	23.36%

Notes: This table presents probit regression estimates of firm-level shareholder activism events (proxy contest and shareholder proposal) on one and two-year lagged options volume and a set of determinants of shareholder activism, for the subsample of firms with positive options trading volume. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 6: Voting with management: Firms with positive OptVol

	Average Vote for Management (%)		
	Directors	Other	All
	(1)	(2)	(3)
$\text{Ln}(\text{OptVol})_{(t-1)}$	-0.082** (0.036)	-0.302*** (0.079)	-0.130*** (0.035)
Controls	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Observations	9428	4598	9478
Adjusted R^2	0.598	0.107	0.418

Notes: This table presents OLS regression estimates of the average shareholder vote for management-sponsored proposals on one-year lagged options volume and a set of known determinants of shareholder support to management, for the subsample of firms with positive options trading volume. Column 1 contains the results for proposals on Directors, column 2 for Other proposals, and column 3 for All proposals. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year and industry (four-digit sic code) dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 7: Options Volume and Activism: IV Open interest

	Proxy Contest _t		Shareholder Proposal _t	
	(1)	(2)	(3)	(4)
Ln(OptVol) _(t-1) (instrumented)	0.098*** (0.036)		0.102*** (0.014)	
Ln(OptVol) _(t-2) (instrumented)		0.062* (0.034)		0.107*** (0.013)
Controls	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes
Observations	19791	18689	19791	18689

Notes: This table presents instrumental variable (IV) probit regression estimates for firm-level shareholder activism events (proxy contest and shareholder proposal) on one and two-year lagged instrumented options volume and a set of control variables. Annual Options volume is instrumented through the average annual Open interest. A detailed definition of all variables is provided in [Appendix A](#). Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 8: Voting with management: IV Open interest

	Average Vote for Management (%)		
	Directors	Other	All
	(1)	(2)	(3)
Ln(OptVol) _(t-1) (instrumented)	-0.186*** (0.044)	-0.457*** (0.101)	-0.210*** (0.043)
Illiquidity	-0.072*** (0.013)	-0.048*** (0.015)	-0.059*** (0.011)
Ln(Mkt Cap)	0.607*** (0.079)	0.892*** (0.236)	0.660*** (0.088)
Tobin's Q	0.105* (0.060)	0.250 (0.154)	0.116* (0.063)
Ab. Performance _(t-1)	6.291*** (2.075)	3.943 (6.375)	4.084 (3.005)
E-Index	-0.425*** (0.053)	-0.398** (0.160)	-0.595*** (0.066)
CEO compensation (\$ thousands)	-0.168** (0.077)	-0.812*** (0.280)	-0.431*** (0.077)
Board size	0.056* (0.032)	0.047 (0.078)	0.066** (0.032)
Board shares held	0.003*** (0.001)	0.004*** (0.001)	0.004*** (0.001)
Independent directors(%)	2.529*** (0.601)	-0.845 (1.213)	1.664*** (0.573)
Avg. ISS Recommen.	24.109*** (0.631)	9.078*** (1.120)	22.749*** (0.658)
Unequal voting dummy	2.022*** (0.413)	0.897 (1.018)	1.832*** (0.517)
Confidential voting dummy	-0.084 (0.151)	-0.248 (0.390)	-0.166 (0.162)
Institutional HHI	5.173* (2.704)	16.164** (6.434)	7.705*** (2.599)
Institutional Ownership	-0.477 (0.486)	-0.537 (1.138)	-0.212 (0.478)
Observations	9428	4598	9478

Notes: This table presents 2SLS regression estimates of the average shareholder vote for management-sponsored proposals on instrumented one-year lagged options volume and a set of known determinants of shareholder support to management. Column 1 contains the results for proposals on Directors, column 2 for Other proposals, and column 3 for All proposals. Annual options volume is instrumented through average annual Open interest. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year and industry (four-digit sic code) dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 9: Number of activist events

	#Proxy Contests $_t$			#Shareholder Proposals $_t$		
	OLS	Poisson	Neg.Binom.	OLS	Poisson	Neg.Binom.
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{Ln}(\text{OptVol})_{(t-1)}$	0.010** (0.004)	0.200*** (0.077)	0.489*** (0.082)	0.065*** (0.007)	0.150*** (0.028)	0.169*** (0.029)
$\text{Ln}(\text{Illiquidity})_{(t-1)}$	-0.008* (0.005)	-0.209 (0.141)	-0.525*** (0.124)	0.009 (0.006)	-0.245*** (0.065)	-0.223*** (0.071)
Ab. Performance $_{(t-1)}$	-0.247 (0.171)	-4.228 (3.245)	4.772 (4.205)	-0.112 (0.120)	-3.459*** (1.043)	-2.974** (1.295)
Ab. Performance $_{(t-2)}$	-0.252*** (0.091)	-6.507*** (2.518)	-15.079*** (3.671)	-0.489*** (0.093)	-6.929*** (0.909)	-7.206*** (1.112)
Institutional HHI $_{(t-1)}$	-0.023 (0.025)	-1.566 (1.179)	-6.275*** (1.304)	0.216*** (0.031)	-0.479 (0.610)	-0.632 (0.667)
Institutional Ownership $_{(t-1)}$	0.083*** (0.025)	2.085*** (0.590)	4.944*** (0.781)	-0.062 (0.040)	1.156*** (0.199)	1.100*** (0.227)
Analyst Coverage $_{(t-1)}$	-0.000 (0.002)	-0.003 (0.026)	0.013 (0.027)	0.017*** (0.003)	0.006 (0.005)	0.015** (0.006)
Volatility $_{(t-1)}$	0.038 (0.086)	-0.734 (2.117)	-1.942 (2.182)	-0.239*** (0.071)	-1.232 (0.846)	-2.310*** (0.872)
Nasdaq $_{(t-1)}$	0.025 (0.018)	0.462 (0.322)	0.374 (0.318)	0.009 (0.016)	0.042 (0.118)	0.071 (0.117)
$\text{Ln}(\text{Mkt Cap})_{(t-1)}$	-0.026*** (0.009)	-0.649*** (0.210)	-1.673*** (0.207)	0.019 (0.013)	-0.070 (0.070)	-0.181** (0.082)
Tobin's $Q_{(t-1)}$	-0.004 (0.005)	-0.129 (0.164)	-0.451*** (0.138)	-0.022*** (0.006)	-0.068 (0.041)	-0.041 (0.043)
$\text{Ln}(\text{Sales})_{(t-1)}$	0.008 (0.007)	0.124 (0.121)	-0.128 (0.140)	0.055*** (0.009)	0.363*** (0.048)	0.355*** (0.057)
Dividend yield $_{(t-1)}$	0.075 (0.210)	1.500 (3.237)	-2.764 (4.001)	0.817*** (0.216)	4.339*** (1.082)	4.361*** (1.358)
Cash $_{(t-1)}$	0.016 (0.048)	0.141 (0.916)	1.468 (1.134)	0.018 (0.037)	-0.385 (0.432)	-0.781* (0.446)
R&D $_{(t-1)}$	0.031 (0.079)	0.552 (1.249)	-1.005 (1.731)	0.249*** (0.071)	0.149 (1.372)	1.275 (1.089)
Observations	33736	33736	33736	33736	33736	33736

Notes: This table presents the regression estimates of firm-level shareholder activism events (proxy contest and shareholder proposal) on one-year lagged options volume and a set of determinants of shareholder activism. Columns 1 and 4 present results from OLS model while columns 2 and 5 provide estimates from a Poisson model. Finally, columns 3 and 6 provide results from Negative Binomial regression. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 10: Options Volume and Activism in Overvalued firms

	Proxy Contest _t		Shareholder Proposal _t	
	(1)	(2)	(3)	(4)
Ln(OptVol) _(t-2) × Ln(1/Inst.Own.) _(t-1)	-0.067*** (0.023)		-0.118*** (0.009)	
Ln(OptVol) _(t-2) × Volatility _(t-1)		-0.126 (0.155)		-0.288*** (0.100)
Ln(OptVol) _(t-2)	0.079*** (0.027)	0.066** (0.029)	0.141*** (0.010)	0.117*** (0.013)
Ln(1/Inst.Own.) _(t-1)	-0.473*** (0.183)		-0.704*** (0.120)	
Volatility _(t-1)	-0.213 (0.504)	-0.072 (0.518)	-1.180*** (0.329)	-0.828** (0.401)
Controls	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes
Avg. interaction effect (average z-value)	-0.001 (-1.138)	-0.001 (-0.180)	-0.019*** (-5.102)	-0.042*** (-3.417)
Observations	33736	33736	33736	33736
Pseudo R ²	0.080	0.074	0.342	0.324

Notes: This table presents probit regression estimates of firm-level shareholder activism events (proxy contest and shareholder proposal) on one and two-year lagged options volume and a set of determinants of shareholder activism, as well as the interaction term of options volume with two overvaluation proxies, Ln(1/Inst.Own)_{t-1} and Volatility_{t-1}. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 11: Voting with ISS

	Average Vote with ISS(%)			
	(1)	(2)	(3)	(4)
$\text{Ln}(\text{OptVol})_t$	-0.270*** (0.097)		-0.238** (0.098)	
$\text{Ln}(\text{OptVol})_{(t-1)}$		-0.291*** (0.093)		-0.263*** (0.094)
$\text{Ln}(\text{OptVol})_t \times \text{Avg. ISS Blanket Rec}$			-0.025** (0.011)	
$\text{Ln}(\text{OptVol})_{(t-1)} \times \text{Avg. ISS Blanket Rec}$				-0.021* (0.011)
Avg. ISS Blanket Rec			-0.054 (0.050)	-0.067 (0.052)
Illiquidity	0.028 (0.056)	0.028 (0.056)	0.028 (0.056)	0.027 (0.056)
$\text{Ln}(\text{Mkt Cap})$	1.554*** (0.199)	1.581*** (0.195)	1.543*** (0.199)	1.572*** (0.195)
Tobin's Q	0.004 (0.168)	-0.012 (0.168)	0.006 (0.168)	-0.011 (0.167)
$\text{Ab. Performance}_{(t-1)}$	24.696*** (6.247)	22.974*** (6.226)	24.414*** (6.248)	22.823*** (6.226)
E-Index	-0.484*** (0.147)	-0.486*** (0.146)	-0.420*** (0.148)	-0.423*** (0.148)
CEO compensation (\$ thousands)	-1.929*** (0.306)	-1.927*** (0.306)	-1.870*** (0.311)	-1.877*** (0.311)
Board size	0.235*** (0.084)	0.234*** (0.084)	0.233*** (0.084)	0.232*** (0.084)
Board shares held	-0.006*** (0.002)	-0.006*** (0.002)	-0.006*** (0.002)	-0.006*** (0.002)
Independent directors(%)	23.031*** (1.550)	23.051*** (1.551)	23.063*** (1.549)	23.073*** (1.550)
Avg. Mgmt. Rec.	45.943*** (2.037)	45.963*** (2.035)	42.210*** (2.206)	42.301*** (2.205)
Unequal voting dummy	-6.752*** (1.194)	-6.758*** (1.197)	-6.807*** (1.195)	-6.817*** (1.198)
Confidential voting dummy	0.332 (0.395)	0.339 (0.395)	0.246 (0.395)	0.249 (0.395)
Institutional HHI	-26.196*** (6.576)	-25.544*** (6.570)	-26.341*** (6.563)	-25.678*** (6.559)
Institutional Ownership	1.156 (1.244)	1.130 (1.241)	1.112 (1.243)	1.092 (1.241)
Observations	12042	12042	12042	12042
Adjusted R^2	0.192	0.192	0.193	0.193

Notes: This table presents OLS regression estimates of the average shareholder vote with ISS recommendations on contemporaneous and one-year lagged options volume and a set of known determinants of shareholder voting behavior. Columns 3 and 4 extend the specification by including the interaction term of options volume with the average proportion of blanket issues for voting on that year. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year and industry (four-digit sic code) dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table 12: Options volume and voting: Close votes

	Ab.Return(%) meeting day	
	(1)	(2)
Ln(OptVol)	0.006 (0.039)	0.848*** (0.123)
Pass dummy	-0.168 (0.625)	-5.707*** (1.789)
Ln(OptVol) × Pass dummy	0.052 (0.072)	0.567** (0.243)
ISS rec. 'For'	0.309 (0.500)	4.570*** (1.066)
Ln(OptVol) × ISS rec. 'For'		-0.856*** (0.130)
Pass dummy × ISS rec. 'For'		5.644*** (1.899)
Ln(OptVol) × Pass dummy × ISS rec. 'For'		-0.520** (0.253)
Constant	-0.412 (0.519)	-4.590*** (1.011)
Observations	518	518
R^2	0.008	0.048

Notes: This table presents the results from regressing abnormal returns on the meeting day on options trading volume, a passed proposal dummy, and a dummy variable equal one if ISS recommends voting 'for' in that proposal and zero otherwise. Model in column 1 includes options volume, a pass dummy, the interaction between these two, and the dummy for ISS recommending 'for'. Model in column 2 includes the triple interaction between these three variables. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

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Appendix A Variable definition

A.1. Variables

Variable	Definition
Options Volume (Millions)	Total daily trade in each option multiplied by end-of-day quote midpoint for that option. This number is then aggregated across all options for a single stock on all trading days for a given year. Following Roll, Schwartz, and Subrahmanyam (2009) . Source: Option Metrics.
Ln(Option Volume)	Natural logarithm of Options Volume.
Open Interest	Annual average of the daily Open interest (number of put and call contracts that remain open in a stock) provided by Option Metrics.
Ln(Open Interest)	Natural logarithm of Open Interest.
Moneyness	Annual average of the daily absolute deviation of the exercise price of each traded option from the closing price of the underlying stock. Following Roll, Schwartz, and Subrahmanyam (2009) . Source: Option Metrics and CRSP-Compustat.
Ln(Moneyness)	Natural logarithm of Moneyness.
Proxy Contest	Binary variable that equals 1 if the firm experienced a proxy contest during year t and zero otherwise. Data from ISS (formerly RiskMetrics).
Shareholder Proposal	Binary variable that equals 1 if the firm experienced a shareholder proposal during year t and zero otherwise. Data from ISS (formerly RiskMetrics).
Abnormal Performance	Firm stock return during year t minus the return of a value-weighted market portfolio (CRSP Value-weighted) during the same period. Data from CRSP.
Ln(MarketCap)	Natural logarithm of end-of-December firm market capitalization (price \times shares outstanding) from CRSP-Compustat.
Tobin's Q	Sum of the market capitalization of a firm's common equity (stock price times shares outstanding at the end of the quarter), liquidation value of its preferred shares and the book value of debt, divided by book value of assets. Based on CRSP-Compustat items. (Tobin's Q = $(prccq \times cshoq + atq - ceqq - txdb) / atq$).
Ln(Illiquidity)	Natural logarithm of the Amihud (2002) illiquidity measure calculated as the ratio between absolute stock return and turnover from CRSP over a trading quarter.
Nasdaq	Dummy variable equal one if the firm is traded on the Nasdaq market and zero otherwise. Data from CRSP.
Ln(Sales)	Natural logarithm of sales obtained from Compustat.
Dividend yield	Total dividend (common and preferred) over market value of common equity plus book value of preferred equity. Data from Compustat and CRSP.

A.1. Variables (continuation)

Variable	Definition
Cash	Cash plus marketable securities divided by total assets. Data from Compustat.
Volatility	Standard deviation of monthly returns from CRSP during year t .
R&D	Research and development expenses over total assets. R&D expenses are substituted by zero when missing. Data from Compustat.
Bid-Ask Spread	Average of the daily relative bid-ask spread for a stock and quarter. Relative Bid-Ask Spread = $100 \times (\text{Ask} - \text{Bid}) / (0.5 \times (\text{Ask} + \text{Bid}))$. Source: CRSP-Compustat.
Ln(Bid-Ask Spread)	Natural logarithm of Bid-Ask Spread.
Institutional Ownership	Total shares held by institutional investors from the Thomson Reuters 13F quarterly filing over total shares outstanding from CRSP.
Institutional HHI	Herfindahl-Hirschman concentration index for Institutional investors holdings on firm i in year t . Data from Thomson Reuters 13F filings.
Analyst Coverage	Number of analyst following a stock on year t . Data from I/B/E/S.
Avg. vote for management	Shareholder votes 'for' management-sponsored proposals over the voting base. Data from ISS (formerly RiskMetrics).
E-index	Index measuring managerial entrenchment following Bechuk, Cohen, and Ferrell (2009) . Data from ISS (formerly RiskMetrics).
CEO compensation	Data on CEO total compensation obtained from Execucomp.
Board size	Number of directors in the board of a firm. Data from ISS (formerly RiskMetrics).
Board shares held	Number of firm shares in hands of board members. Data from ISS (formerly RiskMetrics).
Independent directors	Ratio of independent directors over total directors in the board of a firm. Data from ISS (formerly RiskMetrics).
Avg. ISS recommendation	Average recommendation from ISS on all issues considered for vote in a firm in a given year. Data from ISS (formerly RiskMetrics).
Unequal voting dummy	Dummy variable equal one if a firm has different classes of shares with different voting power and zero otherwise. Data from ISS (formerly RiskMetrics).
Confidential voting dummy	Dummy variable equal one if the firm's policies prevents management from knowing how shareholders vote with their proxy cards and zero otherwise. Data from ISS (formerly RiskMetrics).

Appendix B Additional tables

Table B1: Options Volume and Activism: IV
Moneyness & Open interest

	Proxy Contest _t		Shareholder Proposal _t	
	(1)	(2)	(3)	(4)
Ln(OptVol) _(t-1) (instrumented)	0.098*** (0.036)		0.102*** (0.013)	
Ln(OptVol) _(t-2) (instrumented)		0.093** (0.041)		0.126*** (0.015)
Controls	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes
Observations	19791	18689	19791	18689

Notes: This table presents instrumental variable (IV) probit regression estimates for firm-level shareholder activism events (proxy contest and shareholder proposal) on one and two-year lagged instrumented options volume and a set of control variables. Annual Options volume is instrumented through the average annual Open interest and annual Moneyness. A detailed definition of all variables is provided in [Appendix A](#). Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table B2: Voting with management: 2SLS regressions: IV Moneyiness & Open interest

	Average Vote for Management (%)		
	Directors	Other	All
	(1)	(2)	(3)
Ln(OptVol) _(t-1) (instrumented)	-0.200*** (0.044)	-0.406*** (0.093)	-0.220*** (0.043)
Controls	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Observations	9428	4598	9478

Notes: This table presents 2SLS regression estimates of the average shareholder vote for management-sponsored proposals on instrumented one-year lagged options volume and a set of known determinants of shareholder support to management. Column 1 contains the results for proposals on Directors, column 2 for Other proposals, and column 3 for All proposals. Annual options volume is instrumented through average annual Open interest and annual Moneyiness. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year and industry (four-digit sic code) dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table B3: Options Volume and Activism:
First-stage regressions

	Ln(OptVol) _(t-1)	
	(1)	(2)
Ln(Open) _(t-1)	1.011*** (0.006)	
Ln(Moneyiness) _(t-1)		1.368*** (0.030)
Ln(Illiquidity) _(t-1)	-0.364*** (0.009)	-0.856*** (0.013)
Ab. Performance _(t-1)	0.234 (0.244)	-0.859** (0.356)
Ab. Performance _(t-2)	3.677*** (0.193)	3.733*** (0.281)
Institutional HHJ _(t-1)	-0.319** (0.136)	0.124 (0.197)
Institutional Ownership _(t-1)	0.246*** (0.038)	-0.473*** (0.056)
Analyst Coverage _(t-1)	0.013*** (0.001)	0.048*** (0.002)
Volatility _(t-1)	4.180*** (0.147)	7.896*** (0.224)
Nasdaq _(t-1)	0.082*** (0.018)	-0.013 (0.026)
Ln(Mkt Cap) _(t-1)	0.165*** (0.013)	0.286*** (0.018)
Tobin's Q _(t-1)	0.134*** (0.007)	0.147*** (0.010)
Ln(Sales) _(t-1)	-0.002 (0.008)	0.002 (0.011)
Dividend yield _(t-1)	-0.435 (0.303)	-1.153*** (0.440)
Cash _(t-1)	0.328*** (0.064)	0.862*** (0.092)
R&D _(t-1)	-0.969*** (0.097)	0.162 (0.141)
Observations	19791	19791
Adj. R ²	0.869	0.724

Notes: This table presents the results from the first-stage of the instrumental variable probit regression. Options volume is regressed on each of the two instruments (Open interest and Moneyiness), as well as a set of known determinants of shareholder activism. All regressions include time dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table B4: Options volume and voting: first-stage regressions

	Ln(OptVol)		
	(1)	(2)	(3)
Ln(Open)	1.096*** (0.010)		1.065*** (0.010)
Ln(Moneyness)		1.423*** (0.043)	0.270*** (0.031)
Illiquidity	-0.007** (0.003)	-0.007* (0.004)	-0.006* (0.003)
Ln(Mkt Cap)	0.485*** (0.013)	1.376*** (0.016)	0.512*** (0.013)
Tobin's Q	0.182*** (0.011)	0.084*** (0.015)	0.184*** (0.011)
Ab. Performance _(t-1)	3.800*** (0.364)	2.619*** (0.543)	3.930*** (0.360)
E-Index	0.011 (0.009)	-0.013 (0.014)	0.013 (0.009)
CEO compensation (\$ thousands)	0.066*** (0.016)	0.135*** (0.027)	0.067*** (0.016)
Board size	-0.001 (0.006)	-0.008 (0.008)	-0.001 (0.006)
Board shares held	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)
Independent directors(%)	0.031 (0.092)	-0.016 (0.134)	0.015 (0.092)
Avg. ISS Recommen.	0.023 (0.048)	0.004 (0.072)	0.030 (0.048)
Unequal voting dummy	0.093 (0.059)	0.170* (0.094)	0.106* (0.059)
Confidential voting dummy	-0.058** (0.027)	-0.002 (0.041)	-0.062** (0.027)
Institutional HHI	-1.555*** (0.566)	-4.403*** (0.830)	-1.896*** (0.578)
Institutional Ownership	0.945*** (0.085)	0.946*** (0.131)	0.965*** (0.084)
Observations	11267	11267	11267
Adjusted R ²	0.902	0.767	0.903

Notes: This table presents the results from instrumental variable (2SLS) regression. Shareholder support to ISS is regressed on contemporane, as well as a set of known determinants of shareholder voting behavior. All regressions include time and industry dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.

Table B5: Voting with ISS: 2SLS

	Average Vote with ISS(%)	
	(1)	(2)
Ln(OptVol) _t (instrumented)	-0.433*** (0.118)	
Ln(OptVol) _(t-1) (instrumented)		-0.261** (0.126)
Illiquidity	0.068** (0.030)	0.065** (0.029)
Ln(Mkt Cap)	1.935*** (0.231)	1.704*** (0.247)
Tobin's Q	-0.037 (0.169)	-0.008 (0.189)
Ab. Performance _(t-1)	23.601*** (6.208)	25.939*** (6.955)
E-Index	-0.472*** (0.148)	-0.724*** (0.165)
CEO compensation (\$ thousands)	-1.904*** (0.302)	-1.860*** (0.320)
Board size	0.185** (0.084)	0.196** (0.093)
Board shares held	-0.006*** (0.002)	-0.005** (0.002)
Independent directors(%)	23.073*** (1.550)	22.128*** (1.726)
Avg. Mgmt. Rec.	46.899*** (2.024)	49.307*** (2.063)
Unequal voting dummy	-8.492*** (1.290)	-9.251*** (1.376)
Confidential voting dummy	0.393 (0.398)	0.281 (0.435)
Institutional HHI	-19.688*** (6.790)	-17.343** (7.490)
Institutional Ownership	1.395 (1.292)	1.873 (1.410)
Observations	11196	9478

Notes: This table presents instrumental variable (2SLS) regression estimates of the average shareholder vote with ISS recommendations on contemporaneous and one-year lagged instrumented options volume and a set of known determinants of shareholder voting behavior. Options volume is instrumented through average annual Open interest and annual Moneynews. A detailed definition of all variables is provided in [Appendix A](#). All regressions include year and industry (four-digit sic code) dummies. Robust standard errors are in parentheses. The sample period is 2003-2014. ***, ** and * denote significance at the 1%, 5% and 10%, respectively.