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Virtual Shareholder Meetings

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We thank Tara Bhandari, Shiva Rajgopal (discussant) and workshop participants at Drexel University (Gupta Governance Seminar Series), 2021 Burton conference (Columbia Business School), 4th Greater Boston Corporate Governance Workshop, Florida International University, Free University of Bozen-Bolzano, George Washington University, INSEAD, University of Calgary, University of Connecticut, University of Minnesota, and University of Toronto for their comments; Cathy Conlon and Katerina Katolis at Broadridge Financial Solutions for useful conversations on virtual shareholder meetings (VSM) and for sharing data on state laws related to VSM. We thank Douglas Chia (Soundboard Governance) and Carl T. Hargberg (Carl T. Hagberg & Associates) for their insights on the practice of annual shareholder meetings. We acknowledge Claudio Ferri, Dan Li, Zeyu Ou, and Yini Wang for excellent research assistance.

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Abstract

We examine determinants and consequences of 'virtual' shareholder meetings (VSM), using a sample of voluntary (pre-Covid) and forced (i.e. due to Covid) VSM adopters. Voluntary adopters are tech firms, and firms traditionally more engaged with shareholders, consistent with the stated objective to increase shareholder participation. In contrast, we do not find that firms choose the virtual format to avoid shareholders' scrutiny. Textual analysis of transcripts suggests that in VSM business presentations by management are less frequent, shorter and more generic, but only among voluntary adopters, suggesting that these properties reflect a firm's choice rather than a byproduct of the virtual format per se. VSM are more likely to exhibit no questions during the Q&A, but conditioned upon having one question, they exhibit the same number of questions, and such questions are more negative in tone, inconsistent with managers' using the virtual format to filter out hostile questions. Finally, there is some evidence of greater abnormal absolute returns around VSM, supporting the notion that greater attendance translates into greater information content. Overall, VSM exhibit less activity on average, consistent with critics' concerns, but such reduced activity does not appear to cause a loss in information content nor to reflect an attempt to avoid scrutiny.

Keywords: virtual shareholder meetings, annual shareholder meetings, corporate governance, shareholder engagement, investor relations

JEL Classifications: G34, G30, M40

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1. Introduction

> *"...the virtual-only format...is in the best interests of our shareholders, given the time and expense of an in-person meeting compared to the shareholder participation at those meetings...For the past five in-person meetings, only about 30 shareholders attended each of the meetings. The meetings, on average, lasted less than 45 minutes, including the formal business portion of the meeting, the remarks by the CEO, a video highlighting the Company's performance, and the question and answer period. A virtual meeting allows all of our shareholders, regardless of location, the ability to participate in the Annual Meeting"* (Pinnacle West Capital, Proxy Statement, March 29, 2018)

> *"Who wants to stand in front of a live audience and explain shrinking sales, epic recalls and loss of market share? It is so much easier to explain it to a microphone"*
> (Activist J. Chevedden's letter protesting General Motor's decision to use a virtual-only format, PX14A6G Filing, May 2, 2019)

We examine determinants and consequences of holding 'virtual' shareholder meetings (hereinafter VSM), i.e. meetings where shareholders are able to participate (i.e. attend, submit questions and, if desired, vote) exclusively online via the Internet.[1] The rise of VSM in the United States traces back to 2009 when Broadridge Financial Solutions (hereinafter Broadridge) launched its VSM platform, leading to almost 300 firms holding a VSM by 2019 (Figure 1).[2] In 2020 due to Covid-19 (hereinafter Covid) thousands of firms were forced to hold a VSM, and many believe some version of VSM will become the predominant form of shareholder meeting (Proxy Insight 2020).

Proponents of VSM note that in-person meetings are costly to organize yet poorly attended, while a VSM is less costly (to the firm and to shareholders) and allows for larger attendance, which could result in more informative annual meetings. In contrast, critics are concerned that firms will use the virtual format to limit shareholders' voice (WSJ 2020). For example, because in VSM shareholders submit their question online directly to management (other shareholders do not see the questions), management can 'cherry pick' and filter out uncomfortable questions. Furthermore, a shift to a VSM may deprive participating shareholders benefits of face-to-face interactions – such as nonverbal cues,

[1] We refer to in-person meetings which provide shareholders with the option to participate and vote online as 'hybrid' meetings. A simple live webcast of an annual meeting does not constitute a virtual nor hybrid meeting since it does not allow shareholders to participate in the meeting (i.e. submit questions and vote).

[2] Broadridge Financial Solutions, Inc. is a provider of investor communications and technology-driven solutions to banks, broker-dealers, mutual funds, and corporate issuers. Among other things, Broadridge is responsible for distributing proxy statements and tallying shareholder votes (Broadridge controls about 90% of the proxy market; Schaefer 2013). Broadridge offers its VSM platform only for uncontested annual meetings.

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learning through informal interactions with management – identified by the disclosure literature in other settings (Bushee, Jung and Miller 2011, 2017; Green, Jame, Markov, and Subasi 2014a, 2014b; Soltes 2014; Solomon and Soltes 2015; Kirk and Markov 2016). Finally, for retail shareholders annual meetings are generally the only opportunity for direct interaction with managers and directors.

Motivated by the increasing relevance of this innovation in corporate communications and the underlying debate, we examine two broad questions. The first is whether VSM meetings represent a case of poor governance, leading to diminished shareholder rights. The second is whether and how the virtual format affects the information content of the annual meetings.

To address these questions, we first identify 1,432 virtual or hybrid meetings voluntarily held by 426 distinct firms between 2000 (when Delaware began to allow VSM) and February 2020 (before Covid). Most of these meetings are virtual, with hybrid meetings often used as an intermediate step by firms transitioning from in-person to virtual. Voluntary VSM adopters tend to be tech firms, and firms traditionally more engaged with their investors. This is consistent with firms' stated motives to increase shareholder participation and project a tech-savvy image (Appendix 1.A). Importantly, firms do not appear to adopt the virtual format to avoid scrutiny. For example, we do not find that firms under greater shareholder pressure (e.g., firms expecting a contentious meeting, with worse stock performance) or with poor governance quality are more likely to hold a VSM. Also, we fail to detect a significant, negative price reaction around the proxy filing announcing the VSM, both on average and among firms with the strongest incentives to avoid scrutiny (e.g. firms with contentious meetings).

Next, we examine the effect of VSM on the meeting's information content, as reflected in the activity taking place at the meeting. To measure such activity, we apply textual analysis to the meetings' transcripts, and then analyze the effects of a switch to a virtual format using first a sample of (pre-Covid) voluntary VSM adopters, and then a sample of forced VSM adopters (due to Covid).

With regard to voluntary VSM, we perform four sets of tests. We start by comparing 794 VSM and 1,887 in-person meetings with available transcripts taking place prior to March 2020 (hereinafter 'full sample'). Because the sample of in-person meetings includes larger firms, we then repeat the comparison using a size-matched subset of in-person meetings. Next, to account for time-invariant

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firm characteristics, we examine a smaller sample of firms with available transcripts for both their VSM and their prior in-person meetings. Finally, we perform a multivariate analysis of the association between the virtual format and meetings' activity in the full sample.

Combined, these tests yield the following findings. On average, VSM meetings are significantly shorter than in-person meetings (15.3 versus 46.9 minutes, using the full sample). Two factors contribute to this difference. First, VSM are less likely to include a business presentation (42.4% versus 85.1% of the meeting), and, if they do, it is shorter (1,006 words vs. 1,860) and less 'specific' (i.e., it uses more generic language). Second, the Q&A section is substantially shorter, (mostly) because the percentage of meetings with an 'active' Q&A session (i.e. with at least one question) is significantly lower, at 21.7% versus 49.2%, and because the questions are shorter. However, when there is an active Q&A, the number of questions does not differ from in-person meetings. Notably, the sentiment (linguistic tone) of shareholder questions' in VSM is markedly more negative.

Our interpretation of this set of findings is as follows. First, in VSM management provides less information to shareholders via the business presentation. These results are not inherent to the virtual format since management controls the business presentation. Thus, it appears that management – rather than adopting the VSM format to convey more content to a larger audience – aims to keep the meeting as concise as possible, under the view that such meeting is a compliance exercise to be performed efficiently – a view perhaps informed by the experience with in-person meetings (see opening quote). Second, in VSM shareholders' questions are shorter and more negative in tone. Both results can be attributed to the virtual technology. Questions prepared in advance and submitted via chat tend to be more concise than those asked live at the microphone. As for the tone, we suggest that the impersonal nature of online communication allows shareholders to be more aggressive in their questioning.

Third, our findings related to the level of Q&A activity do not support critics' claims that managers use the virtual format to filter out uncomfortable questions ('cherry picking') and avoid shareholders' scrutiny. Under the 'cherry picking' story, one would expect a lower number of questions in VSM, whereas in meetings with an active Q&A the number of questions is similar to in-person meetings. The 'cherry picking' story seems inconsistent with the markedly more negative tone of questions in VSM,

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and the lack of significant difference in tone between the first and last question – inconsistent with management picking more 'friendly' questions first and deliberately attempting to 'run out of time' before the most challenging ones. Further, in VSM executives' answers are not shorter nor less specific, as one would expect if management was trying to minimize interactions with shareholders.

Next, we perform a similar set of analyses for the sample of post-Covid 'forced' VSM adopters. Since Covid represents an exogenous shock, examining forced adopters allows for better causal identification of the effects of the virtual format on the meeting's activity.[3] To examine this sample, we perform a difference-in-difference univariate analysis, comparing changes in meetings' content at firms forced to switch from the in-person format in 2019 to the virtual-only format in 2020 (the treatment group), relative to a control sample of firms that were already (voluntarily) using the virtual-only format in 2019 and continued to do so in 2020 (the control group). In contrast to the pre-Covid sample of voluntary adopters, we find no evidence of a change in the frequency and properties of the business presentations, and in the likelihood of an active Q&A. As in the sample of voluntary adopters, shareholders' questions are shorter and more negative, while the number of questions is not affected by the shift to the VSM format. Results are generally similar when using a size-matched control sample and in multivariate tests, except that we find some evidence of an *increase* in the number of questions.

When combined with the findings from the sample of pre-Covid voluntary adopters, the picture that emerges is the following. First, the shift to VSM is associated with less frequent, shorter and less specific business presentations *only* among voluntary adopters, consistent with an endogenous effect: that is, both the adoption of VSM and the changes to the business presentation reflect these firms' view that the meeting is a compliance exercise to be performed efficiently. The reduced use of business presentations is not "caused" by the virtual format. Indeed, it is not observed in the sample of forced

[3] While appealing for identification, the post-Covid setting also has some drawbacks. Because the pandemic began shortly before the 2020 proxy season, firms and investors had little time to prepare and get comfortable with the technology. Additionally, the sudden increase in demand for VSM platforms led to the emergence of over a dozen alternative platforms, often lacking the functionalities offered by the long-tested Broadridge platform, which may have affected the meeting dynamics. Thus, findings from post-Covid forced VSM adoptions may not be generalizable and should be viewed as complementing (rather than replacing) the analysis of voluntary VSM adopters.

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adopters. Notably, neither group seemed to view the potentially larger audience of VSM as an opportunity to offer a more comprehensive and detailed business update.

Second, the shift to VSM is associated with shorter shareholders' questions and significantly more negative tone in *both* samples, suggesting that (in contrast to the business presentation result) this is not an endogenous effect, but rather the effect of the online technology per se, as conjectured earlier.

Third, as for the level of Q&A activity, in both samples we find no evidence of a reduction in the number of shareholder questions. Moreover, executives' answers are neither shorter nor less specific after the shift to VSM. Overall, these results do not support the contention that (whether voluntary or forced) the use of the virtual format results in diminished shareholder rights. Combined with the lack of evidence that firms adopt VSM to avoid shareholder scrutiny (e.g. prior to a contentious meeting) our findings suggest that concerns about the governance effects of VSM may have been exaggerated.

Lastly, we analyze the effect of a shift to VSM on investors' perceptions of the meeting's information content using common market-based measures, such as abnormal trading volume and absolute abnormal returns. All else being equal, greater shareholders' attendance in VSM should generate greater trading activity. On the other hand, the reduced activity documented above (especially among voluntary VSM adopters) may result in lower perceived information content. In multivariate tests (controlling for the level of activity at the meeting), we find an increase in absolute abnormal returns (but not in abnormal trading volume) after voluntary VSM adoptions, while forced VSM adoptions exhibit no association with market-based proxies of information content (we conjecture this is because investors' trading during the 2020 proxy season was mostly driven by macro news about Covid). To sum up, there is at least some evidence of an increase in some market-based proxies of information content, consistent with the greater attendance associated with VSM.[4] Importantly, there is no evidence of a decrease. Thus, even if the reduced activity at VSM was the manifestation of

[4] Along the same lines, among in-person meetings, we find higher abnormal absolute returns and trading volume when the meetings offer a live webcast, which (similar to VSM) allows for greater attendance but does not allow shareholders to vote or ask questions during the meeting.

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diminished shareholder rights (which our evidence does not support), it does not appear that investors perceive the information content of VSM to be lower.

Our study is the first to provide large-sample evidence on VSM, a technological innovation widely adopted during the Covid pandemic in the U.S. and abroad. In doing so, we contribute to three streams of research. First, our study adds to the literature on direct communications between firms and market participants. Previous studies examine conference calls (e.g. Bushee, Miller and Matsumoto 2003; Mayew 2008; Matsumoto, Pronk and Roelofsen 2011; Hobson, Mayew and Venkatachalam 2012; Jung, Wong and Zhang 2015, 2018; Mayew and Venkatachalam 2012), investor conferences (e.g. Bushee et al. 2011, 2017; Green et al. 2014a, 2014b; Zhang, 2022), analyst/investor days (Kirk and Markov 2016), IPO roadshows (Blankespoor, Hendricks and Miller, 2017, 2022) and interactive online platforms (Lee and Zhong 2022). We contribute to this research by providing the first evidence on the nature of direct interactions between management and shareholders at annual meetings and how they are affected by the shift to a virtual format. While venues examined in prior research involve sophisticated market participants (analysts, institutional investors), annual meetings are open to any shareholder and mostly attended by retail shareholders. Thus, our evidence also adds to the limited work on the governance role of retail investors (e.g. Brav, Cain and Zytnick 2022). Furthermore, annual meetings represent the only mandatory interaction between firms and shareholders.

Second, by providing evidence on activity taking place at the meeting, as well as its determinants and information consequences, we contribute to the sparse research on annual shareholder meetings. Previous studies document firms' opportunistic behavior in the scheduling of location and time of annual meetings (Li and Yermack 2016) and in terms of disclosures around contentious meetings (Dimitrov and Jain 2011) or focus on annual meetings as a potential source of governance changes through shareholder votes (Cuñat, Gine and Guadalupe 2012; Ertimur, Ferri and Oesch 2018), but do not examine the meeting's content. We fill this gap by providing detailed descriptive evidence on the activity during annual meetings, and how the shift to a virtual format affects such activity and the market reaction to the meeting. By showing that most annual meetings represent a legitimate disclosure outlet (as defined by Mayew 2012), where management provides a business

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presentation and engages in Q&A with shareholders, we expand the set of disclosure events traditionally considered by accounting research (Beyer, Cohen, Lys, and Walther 2010).

Finally, we extend a series of studies on the effect of technological innovations on firms' engagement with investors, such as Lee and Zhong (2022) – who examine interactive online platforms where Chinese firms and investors engage in Q&A activity – and Lee and Souther (2020), who examine firms' choice to use electronic delivery instead of mailing proxy materials.

In a concurrent study, Schwartz-Ziv (2021) compares the activity at VSM held by 125 forced adopters in 2020 (post-Covid) relative to the 2019 in-person meetings by the same firms. Our study differs from Schwartz-Ziv (2021) in five dimensions. First, we also examine all VSM *voluntarily* held by firms prior to Covid, which allows us to test whether such adoptions reflect a desire to avoid shareholders' scrutiny. Importantly, as noted earlier, only the combined analysis of voluntary and forced VSM adoptions allows for a proper interpretation of the effects associated with the use of VSM. Second, when examining forced VSM adoptions, we employ a difference-in-differences design to control for any effect of Covid on the meeting dynamics. Third, we use textual analysis to measure key language properties (e.g. tone, specificity) which are helpful in interpreting management' behavior (e.g. whether management exploits the virtual format to the filter out hostile questions). Fourth, we examine whether the shift to a VSM affects market-based measures of information content. Finally, and importantly, Schwartz-Ziv (2021) interprets the finding that the Q&A session is shorter (both in total and per question) as evidence that VSM diminish shareholders' rights - even though, similar to our study, Schwartz-Ziv (2021) finds no change in the *number* of questions. In contrast, we split the Q&A session into questions and answers and find that in VSM questions are shorter in length, but the length and specificity of answers do not differ from in-person meetings. That is, the shorter duration of the Q&A session is not the result of firms strategically allocating less time to shareholders (by allowing fewer questions or providing shorter and more generic answers) but, rather, is the effect of questions being more concise when submitted via chat. In this respect, our findings may also inform regulators concerned with ensuring that virtual meetings offer shareholders the same rights and opportunities as in-person meetings (SEC 2021).

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2. Institutional setting and academic literature

2.1 Legislative framework

Annual shareholder meetings are regulated by state law. To keep Delaware law current with the emergence of the Internet, in 2000 the Delaware legislature adopted amendments to Section 211 of the Delaware General Corporation Law (DGCL) to allow Delaware–incorporated companies to hold VSM, under certain conditions. In particular, the company must take reasonable measures to ensure that each person deemed present and permitted to vote at the meeting is a shareholder (or the holder of a valid proxy from a shareholder) and has a reasonable opportunity to participate and vote. The company must also maintain records of votes or other actions taken by the shareholders. VSM platforms offered by third-party providers (such as Broadridge) help companies meet these conditions. Over the years, other states have adopted similar provisions. As of April 2020, 30 states allowed both virtual and hybrid meetings, 14 states allowed hybrid (but not virtual) meetings, while seven states continued to only allow in-person meetings (Broadridge 2020).[5]

2.2 Intended benefits of VSM over in-person meetings

VSM adopters cite greater shareholders' participation and cost savings as the two key benefits of VSM (see Appendix 1.A). Shareholders' attendance at in-person meetings is generally low, due to the cost (in terms of time and money) of travelling to the meeting's location, and the concentration/overlap of annual meeting dates during the proxy season. As a result, often only few, mostly local retail and employee shareholders attend the meeting (Nili and Shaner, 2022).[6] In contrast, attending a VSM is significantly less costly. While large sample data on meetings' attendance is not

[5] Alaska, Arkansas, Georgia, Idaho, New Mexico, South Carolina and South Dakota only allow in-person meetings. Connecticut, District of Columbia, Illinois, Iowa, Louisiana, Maine, Massachusetts, Mississippi, Montana, Nebraska, New Hampshire, New Jersey, New York and North Carolina allow hybrid meetings, while the other 30 states allow both virtual and hybrid meetings. However, some of them (e.g., California and Maryland) impose conditions that make virtual meetings impractical or unrealistic (e.g., California requires unrevoked shareowner consent to hold a virtual meeting). In response to the Covid pandemic, California has temporarily lifted its restrictions. Similarly, some of the states allowing hybrid (Connecticut, Iowa, Louisiana, Massachusetts, Mississippi, Montana, New Jersey and New York) or in-person only (e.g. Arkansas and Georgia) announced they would temporarily allow virtual meetings.

[6] Conversations with practitioners indicate that attendance has declined steadily over the last few decades, due to a decrease in retail ownership, greater diversification of investors' portfolio and a reduction of the "perks" offered at the meeting (meals, gadgets). Notable exceptions include the annual meetings of firms such as Berkshire Hathaway, Disney, Starbucks and Wal-Mart, which combine the meeting with a series of events attracting thousands of participants (Feloni 2017).

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available, numerous firms report large increases in attendance after switching to VSM (Gibson, Dunn and Crutcher 2016; see Appendix 1.B).

As for the cost of holding a meeting, early VSM adopters reported spending on VSM only 10% of the direct costs (renting function rooms, hiring appropriate personnel, catering costs) of in-person meeting (Fairfax 2010). Further savings occur in terms of the indirect costs associated with the time and money spent by management and directors to reach a physical location.

2.3 The Mechanics of VSM

The VSM platforms offered by service providers give firms various options in terms of medium (audio vs. video) and forms of shareholders' participation. Almost all firms (97% in 2019) choose to hold an audio-only VSM (in the sense that there is no option to see corporate participants via a live video feed), usually supplemented by a slide presentation (otherwise, the screen will show a static message such as "audio only presentation"). Audio-only meetings are less likely to encounter technical difficulties and are less costly relative to a live video feed.

As for shareholders' forms of participation, shareholder proposals (if any) usually are presented directly by the proponent via an operator-assisted phone line. In contrast, in the Q&A session shareholders typically submit questions online via text (only in few cases VSM allow live shareholders' questions via phone, with an operator managing the queue, similarly to earnings calls). Importantly, other shareholders cannot see the questions: management will read them out loud. This feature has raised significant criticism (Schwartz-Ziv 2021), because it potentially allows management to "cherry-pick" the questions and/or to "water down" the questions' content, especially when critical of management. Some firms (16% of VSM in 2019) allow shareholders to submit questions online prior to the meeting (while not frequent, this is occasionally allowed at in-person meetings as well). Another feature of VSM platforms is that shareholders can choose to preserve anonymity, which may result in more "hostile" questions and/or more shareholders asking questions relative to in-person meetings.

2.4 Academic literature on annual shareholder meetings

Prior literature on annual shareholder meetings is sparse. A few early studies document significant abnormal stock returns and/or trading volume around annual meeting dates (e.g. Brickley

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1986), suggesting that annual meetings may be information-producing events. More recently, a related line of research documents significant abnormal price and trading reactions to shareholder votes on the items in the meeting's agenda (e.g. Cuñat et al. 2012, Ertimur et al. 2018; Brochet, Ferri and Miller 2021; Li, Maug and Schwartz-Ziv 2022). Another line of research documents that managers make strategic choices in connection with annual meetings. For example, Dimitrov and Jain (2011) show evidence of window dressing via optimistic disclosures prior to poorly performing firms' meetings, after which returns completely reverse within 40 days. Similarly, Banko et al. (2013) document abnormally positive accruals in the two quarters prior to annual meetings followed by negative abnormal accruals in the next quarter. Li and Yermack (2016) examine firms' decision to relocate their annual meetings away from their headquarters. They find that relocated annual meetings predict future underperformance. Along these lines, a recent paper based on Korean data suggests that firms that commit corporate fraud are more likely to evade shareholder scrutiny by scheduling their annual meeting on the busiest days (Gam, Gupta, Im, and Shin 2021). The main takeaway from all these studies is that managers try to avoid scrutiny around shareholder meetings, indirectly suggesting that the meetings are perceived as a focal event. However, importantly, the papers above do not consider the meeting format, which may exacerbate or mitigate the frictions they identify (e.g., the virtual format could help shareholders attend physically remote and/or clustered "evasive" meetings), nor do they document the activity taking place during the meetings (e.g. business presentation, Q&A session) – a key innovation in our study thanks to our access to transcripts.

3. Sample Selection and Descriptive Statistics

3.1 Virtual Shareholder Meetings: frequency and rationale

Using textual analysis of proxy statements filed with the SEC's EDGAR system from January 1, 2000 to February 28, 2020 (i.e. pre-Covid) we identify 1,612 preliminary and/or definitive proxy filings announcing an upcoming meeting with a virtual component, corresponding to 1,432 distinct meetings held by 426 distinct firms. For each meeting we hand-collect the date, format (virtual versus hybrid), type (regular versus special), platform used (Broadridge, other service providers, or

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in-house) and the rationale for adopting a virtual format. We also determine whether it is the firm's first virtual or hybrid meeting by examining the prior year's proxy filing and whether the subsequent annual meeting is in-person only (i.e. whether the firm returns to an in-person meeting).

Both virtual and hybrid meetings began to increase after Broadridge launched its platform in 2009, but while hybrid meetings remained at about 20-30 per year, VSM grew from 20 in 2011 to 285 in 2019 (Figure 1A), with about 60 to 70 new VSM adopters each year after 2015 (Figure 1B).

Table 1, Panel A, groups the 426 distinct firms in four categories based on their pattern of use of the virtual format. The first group (labeled *Permanent Adopters*) comprises 346 firms (81% of the sample) which – after adoption – continue to use the virtual format throughout our sample period. In most cases, the firm continues to use the same format as initially adopted (virtual for 286 firms; hybrid for 27 firms). However, a non-trivial number of firms (33) changed from hybrid to virtual, or vice versa, even multiple times. Within this subset, the most common case is firms starting with the hybrid format and then moving to virtual (19 firms), presumably after verifying that the technology works, and investors are comfortable with it. In ten cases firms moved from virtual to hybrid, perhaps because of some investors requesting to add back the in-person component.

A second group of firms (labeled *Temporary Users*) includes 53 firms, which used the virtual format at least once but then switched back to in-person until the end of the sample period, suggesting some dissatisfaction with the experience and, perhaps, shareholder pressure. About two thirds of these firms used the virtual format only for one or two years (unreported). A third, smaller group (labeled *Switchers*), includes 16 firms which adopted the virtual format, went back to an in-person meeting, and switched back to virtual again. The fourth and final group (labeled *One-Time Special Meeting*) includes 11 firms using the virtual format only once for a special meeting, likely because this format is faster and/or less costly to set up and allows more shareholders to attend.

Overall, Panel A suggests that, while most firms made a "final" decision when adopting their meetings' format, there was a significant amount of experimentation, as one would expect upon the introduction of a new technology. It also suggests caution when designing and interpreting empirical

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tests about the choice of the format. For example, firms concerned with costs may choose to experiment with the hybrid format before adopting a virtual one.

Panel B reports firms' disclosures about the rationale for adopting a virtual format. Out of 426 first-time VSM adopters, only 33.6% discuss the rationale (the frequency is similar in the full sample of 1,432 meetings; untabulated), with the percentage increasing in recent years (47% in 2019 versus 15% during the period up to 2015; untabulated). Notably, firms holding a hybrid meeting (hereinafter hybrid firms) almost never discuss their choice, most likely because it is non-controversial (adding the virtual feature to an in-person meeting allows for greater participation without affecting shareholders who opt to attend in-person). Consistent with the literature on voluntary disclosures, unreported tests suggest that larger firms are more likely to discuss their choice.

Greater shareholder participation and, to a lower extent, cost savings are the key stated motives for holding a VSM. Some firms also highlight that VSM are environmentally friendly and that their adoption is consistent with the firm's electronic delivery of proxy filings (Lee and Souther 2020). Other firms note that a virtual format aligns with their technology focus (see Appendix 1.A). Our reading of the proxy filings reveals significant heterogeneity in the extent and detail of disclosures, especially in recent years. Some firms provide specific data about the positive impact of VSM on attendance. Others explicitly acknowledge investors' concerns and detail the actions taken to ensure that shareholders' rights do not differ from in-person meetings (see examples in Appendix 1.C).

Finally, out of 1,432 distinct meetings, 1,349 (94%) were held on Broadridge's platform, 35 (corresponding to 19 distinct firms) on other providers' platforms and 48 (corresponding to 11 firms) were held in-house (untabulated).

3.2 Sample construction and descriptive statistics

Table 2, Panel A, summarizes our sample construction. We require state of incorporation and key financial data in Compustat and CRSP (stock returns, total assets, industry, revenues greater than $5 million), as well meeting-level voting data in ISS Voting Analytics and board-level data in Boardex. These criteria reduce the sample from 1,432 meeting (by 426 firms) to 1,106 meetings (by 316 unique firms). For the control sample (i.e. all other firms in Compustat, CRSP, ISS, and BoardEx), the criteria

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result in 27,554 in-person meetings by 4,467 unique firms. Next, because we want to examine the decision to adopt a virtual format, we only retain control observations from state-years allowing a virtual or hybrid meeting, further limiting the control sample to 25,333 (4,304) meetings (firms). Interestingly, in this step we also lose two (16) firms (meetings) which apparently (perhaps inadvertently) adopted the virtual format when their state did not allow it. Thus, the final sample consists of 1,090 meetings (911 virtual and 179 hybrid), corresponding to 314 unique firms.

Table 2, Panel B, reports basic descriptive statistics about our sample. Both virtual firms (mean total assets of $8.5 billion) and, especially, hybrid firms ($22.0 billion) are larger than the control firms ($7.3 billion) and have a higher market-to-book ratio. Virtual firms have slightly lower ROA, while hybrid firms are more profitable but experienced lower stock returns in the previous year. Among firms holding virtual or hybrid meetings, a larger fraction is incorporated in Delaware (76.3% vs. 63.5%; untabulated), reflecting the fact that Delaware allowed VSM earlier than other states.

In the subsequent analyses we mostly focus on VSM for four reasons. First, the hybrid format is less controversial in that it does not threaten to reduce shareholder rights – shareholders can still attend the meeting in person if they choose to. Second, it does not yield the cost savings of a VSM, since it *increase*s the meeting's cost (indeed, hybrid firms tend to be larger and more profitable – see Table 2, Panel B). Third, the adoption of a hybrid format is often a temporary step toward a VSM (see Table 1, Panel A), clouding any analysis of the format's choice. Finally, the hybrid sample is fairly small.

4. Do firms hold virtual shareholder meetings to avoid shareholder scrutiny?

4.1 The decision to hold a VSM: determinants

As exemplified in the opening quote, critics contend that firms adopt VSM to avoid the embarrassment and scrutiny that might take place at in-person meetings when shareholders publicly criticize firms' performance and governance (Dimitrov and Jain 2011). Furthermore, as discussed earlier, there is a concern that the virtual format may be exploited to filter out uncomfortable questions. To test this "scrutiny avoidance" hypothesis, we examine whether firms expecting a challenging meeting—due to poor performance or contentious items on the ballot—are more likely to hold a VSM. To capture performance, we examine stock returns (*Stock Returns*), the tone of recent media coverage

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(*Media Sentiment*) and an indicator for whether the firm is facing securities litigation (*Litigation*). As for the items on the ballot, following Brochet et al. (2021) we construct indicators for whether the past (*ContentiousPast*) and upcoming meeting (*Contentious*) are likely to be contentious based, respectively, on past and expected voting outcomes for management proposals, shareholder proposals and director elections (see Appendix 2 for variable definitions).[7,8] We further include the number of shareholder proposals (*# Shareholder Proposals*). Even when non-contentious, shareholder proposals may attract more scrutiny as sponsors try to drum up support. We also examine traditional governance proxies, such as board independence (*BdIndep*) and institutional ownership (*%InstOwn*).

Table 3, Panel A, compares our sample of 911 VSM to a size-matched sample of in-person meetings (described in the notes to Table 3) because firms holding VSM tend to be larger (Table 2 Panel B). Table 3, Panel B, reports the result of a logistic regression where the dependent variable is an indicator for firm-years with a VSM and the independent variables are those included in Panel A, plus year fixed effects. Our inferences are similar when using only first-time VSM instead of all firm-years with a VSM. The key insight from Panels A and B is that firms with more contentious (past or upcoming) meetings, more shareholder proposals, worse stock performance, more negative media sentiment, weaker governance and greater litigation are not more likely to hold a VSM.

As for other control variables, firms holding VSM are more likely to be in the technology sector (*Tech*), suggesting that tech firms view the virtual format as projecting a tech-savvy image consistent with their business model (see examples in Appendix 1.A). Also, we find that firms that typically provide more information to, and engage more with, shareholders will naturally view VSM as another opportunity to increase direct interactions with shareholders. To capture firms' propensity to engage

[7] Note that at the time management chooses the meeting format (prior to the filing of the proxy statement with the meeting information), no votes have been cast yet. Thus, only past and expected votes can influence the decision.

[8] While the classification of management and shareholder proposals is based on past voting outcomes, director elections are classified as contentious based on ISS recommendations, which are released after the proxy filing and thus after management's decision on the meeting format. Thus, although most ISS recommendations are predictable based on their stated policies, our variable may introduce look-ahead bias for cases that are not predictable. Accordingly, as a robustness check, we exclude director elections from the definition of contentious meetings in Table 3. Inferences from the univariate and regression results remain unaffected by this change (untabulated).

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with shareholders, we use factor analysis to combine two variables—investor conference attendance and number of management forecasts—into a single score (*Engagement*).[9]

A limitation of our analysis is that we do not have direct measures of the two key stated motives for VSM (see Table 1 and Appendix 1.A), namely increased shareholder participation and cost savings. For the former, ideally, we would measure the fraction of shareholders attending past in-person meetings, which is not available. For the latter, ideally, we would measure the expected savings from shifting to a VSM. Lacking such granular data, to capture firms under greater pressure to cut operating expenses, we use two alternative (admittedly noisy) proxies: profitability (*ROA*) and selling, general & administrative expenses (*SG&A*), following Lee and Souther (2020). Perhaps unsurprisingly, neither variable is significant in the multivariate tests.

Subject to the limitations of our proxies and to the caveat that our design does not allow causal inferences, our analyses suggest that tech firms and firms traditionally more engaged with investors are more likely to hold a VSM. In contrast, we fail to find evidence that firms hold VSM to avoid shareholders' scrutiny, at least on average.

4.2 The decision to hold a VSM: market reaction

Another way to test the "scrutiny avoidance" hypothesis is to examine the market reaction to news that the firm will hold a VSM. If investors believe that the virtual format will result in diminished shareholder rights or interpret its adoption as new negative information about the quality of the firm's governance, we should observe a negative market reaction. In contrast, one may expect a positive reaction if the adoption of a virtual format conveys new information about expected cost savings and/or benefits from increased shareholder attendance. A challenge for a market reaction test is that firms do not have a separate, 'clean' announcement of their choice of the meeting's format, which is only revealed in the proxy filing with other information about meeting agenda, executive pay, board of directors and governance. Perhaps for this reason, when we examine cumulative abnormal returns

[9] In addition to the above variables, we consider a set of firm characteristics that may affect the decision to hold a VSM, such as industry, size (market capitalization, *Market Cap*) and growth options (market-to-book ratio, *MTB*). We also compute the number of annual meetings of other firms on the same date (*#SameDay*), to capture how difficult it is for (diversified) investors to attend the firm's in-person meeting, and the number of institutional investors (*#Institutions*).

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(CAR) in the (-1,+1) window around the proxy filings announcing either a virtual or hybrid meeting, we fail to find a significant market reaction (Table 4, Panel A). We also find no reaction when we partition the sample by whether or not the firm discloses a rationale for their format choice, and by the type of rationale. In Panel B, we repeat the analysis for first-time adopters, on the grounds that after the first year the choice of the meeting's format is less likely to constitute news. We still find no significant market reaction. Subject to the above caveat, it does not appear that shareholders interpret VSM adoptions as an attempt to avoid scrutiny or diminish their rights (or at least, if they do, they do not sell shares in a way to trigger statistically detectable price reactions).

The lack of support for the "scrutiny avoidance" on average does not mean that it does not hold for any subset of firms. To further examine this issue, we perform several cross-sectional tests. Specifically, we test whether firms with contentious meetings, poor performance, and low visibility elicit more negative reactions. In untabulated tests, we find no robust evidence that the market reacts more negatively when firms with contentious meetings (past or current) or poor past performance announce virtual meetings. Interestingly, we find a significantly negative reaction for firms with relatively low visibility (measured by below-median analyst coverage and investor conference attendance). Thus, it appears that investors are concerned that the switch to VSM might affect the meeting's usefulness in firms with a less rich information environment – which indirectly also suggests that they view in-person annual meetings as a valuable disclosure event for those firms.

5. Do virtual shareholder meetings affect the meeting's information content?

The analysis in Section 4 does not support the claim that firms hold a VSM to avoid shareholders' scrutiny, on average. Nonetheless, regardless of their initial motives, it is possible that firms exploit features of the virtual format to limit such scrutiny, or that the technology itself affects the meetings' dynamics in ways that diminish shareholders' rights. Thus, in this section, we examine the consequences of holding a VSM on the information content of the meeting, by examining the text of the meeting's transcript (Sec. 5.1-5.3) and market-based measures of information content (Sec. 5.4).[10]

[10] We also considered examining the effect of VSM on voting outcomes, on the grounds that greater attendance may also translate into a larger fraction of shareholders casting votes during the meeting as opposed to prior to the

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5.1 Consequences of VSM on the activity at the annual meeting: data and predictions

Using Capital IQ, we retrieve the transcripts of annual shareholder meetings that took place prior to February 28, 2020, i.e. pre-Covid. Capital IQ covers firms requested by its users as long as the firm has a publicly available transcript, which biases coverage toward larger firms. Indeed, mean total assets of firm-year meetings with transcripts are $23.7 billion versus $5.6 billion for those without transcripts (untabulated). After merging the transcript data with our sample (last row from Table 2, Panel A), we have transcripts for 87.2% (794 out of 911) VSM and 7.4% (1,877 out of 25,333) in-person meetings. The stark difference reflects the fact that VSM audio recordings are available for later online access on Broadridge's platform and/or on the firm's website, and thus for transcribing.

Annual meetings typically include an "Agenda & Presentation" (A&P) section—where the meeting chair presents the matters voted upon (the formal portion of the meeting), followed by a business presentation by management— and a "questions and answers" (Q&A) section, during which shareholders can ask questions answered by management. The questions cover a wide range of topics related to performance, strategy, finance, and governance (Schwartz-Ziv, 2021). Importantly, neither the business presentation nor the Q&A section is mandatory under state laws. Capital IQ transcripts report separately the text of the A&P and Q&A sections and the meeting's length (*Duration*).

We use textual analysis to characterize properties of the A&P and Q&A portions of the transcript (Appendix 3 describes the algorithm used and its validation in a hand-coded sample of over 500 transcripts). For the A&P section, first we compute its length in terms of number of words (*A&P Length*). Since the agenda portion is mandatory, fairly technical, and mostly driven by the number of items on the ballot, we extract the portion of text capturing the business presentation and we measure the occurrence of such presentation (*Business Presentation*), its length (*Business Presentation Length*), its tone (*Business Presentation Tone*), and its specificity based on Hope, Hu and Lu (2016) (*Business Presentation Specificity*) (Appendix 2 details the variables' definitions).

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meeting (the most common practice). However, data from Broadridge indicate that only a handful of votes are cast during VSM (Broadridge 2020), suggesting that the virtual format does not have any discernible effect on voting outcomes.

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For the Q&A section, we use the algorithm described in Appendix 3 to identify the portions of text capturing a shareholder question and the corresponding management answer. Next, we compute the unconditional mean number of questions asked during the meeting (*# Questions*) and the mean length of the entire Q&A session (*Q&A Length*). Importantly, these numbers are affected by the very occurrence of a Q&A session. Thus, we report the percentage of meetings with at least one question (*Active Q&A* indicator) and then re-compute *# Questions* and *Q&A Length* for the subset of meetings with at least one question (*Active Q&A=1*). For this subset we also compute the average length per question (*Questions' Length*) as well as the tone and specificity of the entire "questions" portion of the Q&A (respectively, *Questions' Tone* and *Questions' Specificity*). As for the answers, we compute the average length per answer (*Answers' Length*) as well as the tone and specificity of the entire "answers" portion of the Q&A (*Answers' Tone* and *Answers' Specificity*). We do not report the number of answers because it generally mirrors the number of questions.

In terms of predictions, for most variables there are reasons to expect a change in either direction depending on the main force at play.[11] Thus, rather than developing formal predictions, we will first present the findings, and then offer our conjectures as to what explanations are most consistent with the results, both individually and collectively.

5.2 Effect of VSM on the activity at the annual meeting: evidence from voluntary adopters

The previous discussion indicates that the effect of the virtual format on the level and type of activity at the shareholder meeting is an empirical question. To address this question, we compare the transcript-based measures described above for a large sample of VSM and in-person meetings with available transcripts and the required control variables (respectively, 794 and 1,887 meetings). In this section we only describe the results of the tests, deferring to Section 5.3 the overall interpretation of

[11] For example, with respect to the A&P portion, on the one hand, since VSM can reach a larger audience, managers may choose to provide longer and more detailed business updates, and to use a positive tone to convey optimism about the future. On the other hand, if firms adopt the virtual format because they view the annual meeting as a compliance exercise to be performed at the lowest cost, they may keep the business presentation shorter and more generic or eliminate it entirely. In addition, the lack of a physical audience may dampen the enthusiasm of the presenter and result (unintentionally) in a less positive tone.

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the various findings. Also, recall that our sample only includes firms that voluntarily chose to hold a VSM before Covid (Section 5.4 examines a sample of post-Covid forced adopters).

Table 5, Panel A, presents the univariate analyses. Before comparing VSM to in-person meetings, it is worth noting that in-person meetings exhibit relatively little action (despite the database's bias toward larger firms): on average, they last only 46.9 minutes, include a shareholder question only 49.2% of the times (in which case they average 5.6 questions), while a business presentation is fairly common (85.1% of the times). These figures may lend support to VSM adopters' argument that most in person-meetings are too expensive relative to their actual content.

Moving to our research question, on average VSM meetings are much shorter than in-person meetings: 15.3 versus 46.9 minutes. Two factors contribute to this difference. First, the A&P section in VSM is substantially shorter (1,799 words vs 4,360). This is both due to the lower frequency of a business presentation (42.4% versus 85.1%), and, conditional on having such presentation, the shorter length (1,006 words vs. 1,860). Second, the Q&A section is also substantially shorter (292 versus 1,390 words), with the mean unconditional number of questions at 0.9 per VSM, versus 2.7 for in-person meetings. The lower Q&A activity in VSM has two explanations. First, the percentage of meetings with an active Q&A session (i.e. at least one question) is significantly lower, at 21.7% versus 49.2%. Second, even within meetings with at least one question, the *Q&A Length* is lower (1,268 vs. 2,721 words), reflecting a lower number of questions (*# Questions:* 4.1 vs. 5.6) and shorter questions (*Questions' Length* 60 vs. 92 words). In contrast, *Answers' Length* does not differ based on the meeting's format. Finally, with respect to specificity and tone, two findings are noteworthy. First, in VSM the business presentation and shareholder questions exhibit less specificity. Second, *Questions' Tone* is markedly more negative, while the *Business Presentation Tone'* is slightly more positive.

Before attributing these marked differences to the meeting's format, it is worth considering other explanations. The first is that firms with VSM and firms with in-person meetings differ in size. In particular, within the sample of meetings with an available transcript (and contrary to Table 2, Panel B), in-person meetings are held by larger firms than VSM (total assets of $28.2 billion versus $11.1 billion; untabulated). Larger firms are more complex and receive more shareholder proposals (e.g.

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Ferri and Sandino 2009), and thus are likely to exhibit more activity at the meeting. To examine whether firm size drives the differences in Panel A, Panel B replicates the analysis using a size-matched control sample (described in the notes to Table 5). Consistent with its smaller size, the size-matched in-person sample exhibits less activity (e.g. shorter presentation, less Q&A) relative to the control sample in Panel A. However, most of the differences documented in Panel A remain large and significant, even if their magnitude is somewhat reduced. For example, the duration of the meeting for the size-matched sample is 34 minutes, less than the 46.9 minutes for in-person meetings in Panel A, but still much higher than for VSM of similar-sized firms (15.7 minutes). An important difference from Panel A is that – conditional on an active Q&A – there is no difference in *# Questions*. That is, once we control for size, VSM continue to be less likely to have an active Q&A (22.0% vs 39.8%), but conditional on an active Q&A, they have the same number of questions (we will discuss potential explanations for this finding in Section 5.3). The results in Panel B are similar when we use propensity score matching (untabulated), using all variables from the determinants model in Table 3.

A second potential explanation for the observed differences is that VSM exhibit less activity not because of the format per se but because firms choose the virtual format exactly because they experience little activity at their in-person meetings and thus prefer to save time and money. Ideally, to assess this possibility, we would like to examine univariate difference-in-differences comparing the change in content from the last in-person meeting to the first VSM for VSM firms, relative to the same change for a size-matched sample of firms with in-person meetings in both years. Unfortunately, only for a small number of VSM we have transcripts for the previous year's in-person meeting by the same firm (for many firms Capital IQ coverage only starts when they adopt a VSM, because the VSM recording is available for transcription). Nonetheless, to gain some insight into the behavior of the same firms over time, in Panel C we compare *all* VSM (N=139) by 39 firms with transcripts for their previous in-person meetings to *all* previous in-person meetings (N=120) by the same firms. This within-firm, over time comparison confirms the differences documented in Panel B, suggesting that they do not simply capture cross-sectional differences in firm characteristics.

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Third, while the univariate analyses in Table 5 control for size (Panel B) and time-invariant firm characteristics (Panel C), in Table 6 we perform a more comprehensive multivariate analysis of the association between virtual format and meetings' content. In doing so, we aim to not only ascertain whether VSM continue to exhibit the differences in Table 5, but also present novel evidence on drivers of activity at the annual meeting – an unexplored research question.

After controlling for a host of firm and meeting characteristics (detailed in Appendix 2), we continue to find that in VSM meeting duration is shorter, and business presentations are less frequent, shorter, with fewer specific words, and have a more positive tone (as per Panel A). As for the Q&A section (Panel B), VSM are associated with a lower number of questions (column 1), due to the lower likelihood of an active Q&A (column 2). However, conditioned upon an active Q&A, there is no difference in the number of questions (column 3). This result mirrors the univariate evidence from Table 5, Panel B and Panel C. The questions' tone remains significantly more negative (column 4), while there is no difference in questions' specificity (in contrast to Table 5). The economic magnitude of the effects (unreported) is generally similar to the univariate tests.

In both panels, numerous control variables load in an intuitive way. For example, a higher number of shareholder proposals and more negative media sentiment are associated with a longer meeting. Poorly performing firms are less likely to do a business presentation but, conditioned on doing it, the presentation is longer, consistent with underperforming firms either providing no information, or providing more information to explain their performance. Poor performance and more negative media sentiment are also associated with higher likelihood and number of questions, while more shareholder proposals are associated with more negative tone of the questions. Interestingly, the *percentage* of institutional ownership is associated with shorter meetings, lower likelihood of a business presentation, lower Q&A activity and less specific questions, while (controlling for such percentage) the *number* of institutions shows the opposite association. Since institutional ownership is negatively associated with retail ownership and most meetings' attendees tend to be local retail investors, a potential explanation for these results is that meetings' activity is higher when expected attendance is higher, as proxied by higher retail ownership (i.e. lower institutional ownership) and a higher *number* of institutions

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(controlling for the level of institutional ownership). Along these lines, a higher number of institutions is also associated with longer and more specific business presentations.

Finally, a fourth potential explanation for the documented differences relates to the fact that annual shareholder meetings have formal "rules of conduct". Such rules determine the time reserved for Q&A (usually 15-30 minutes, depending on the size of the firm), the maximum number of questions per shareholder (usually one or two) and the type of questions allowed (generally, only questions relevant to the matters discussed at the meeting). They also establish that the firm can combine similar, duplicate questions. The enforcement of these rules is generally more difficult at in-person meetings, which could bias our estimates of the level of Q&A activity in favor of in-person meetings. However, based on our examination of hand-collected data we conclude that differential enforcement of the rules of conduct is unlikely to explain our findings (see Appendix 4).

After ruling out these alternative explanations, we next attempt to offer an interpretation for the stark differences between VSM and in-person meetings documented earlier.

5.3 Discussion of findings for voluntary adopters

Collectively, Table 5 and Table 6 provide three sets of findings. First, VSM are significantly shorter, partly due to less frequent or shorter business presentations, which also exhibit less specificity.[12] Thus, management provides less information to shareholders. These results are not inherent to the virtual format: management controls the decision to offer a business presentation and its content. Thus, our interpretation is that management does not adopt the VSM format to convey more information to a larger audience (e.g. via a longer and more detailed business presentation) but, rather, to keep the annual meeting as short and concise as possible, under the view that such meeting is a compliance exercise to be performed efficiently in terms of cost and time – a view probably informed by past experience with in-person meetings (see opening quote).

[12] Note that our measure of *Business Presentation Specificity* is deliberately unscaled. Thus, the observed lower specificity is likely due to the reduced length of business presentations. But this is exactly the point: business presentations in VSM are shorter not only because of more concise language in the 'soft' portion of the text, but also at the expense of providing less detailed information.

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The second finding is that in VSM shareholders' questions are shorter and significantly more negative in tone. We attribute both results to the use of the online technology. Questions prepared in advance and submitted via chat are naturally more concise than those asked live at the microphone. As for the more negative tone, we suggest that the impersonal nature of online communication (combined in some cases with anonymity) allows shareholders to be more aggressive in their questioning. Untabulated tests indicate that the more negative questions' tone in VSM is not driven by the shorter length of the questions.[13] Further, it persists after controlling for the presence and properties of a business presentation, suggesting that it does not only capture a reaction to the reduced length and specificity (or the absence) of the business presentation.

The third and most controversial set of findings concerns the level of Q&A activity. Critics argue that the virtual technology allows management to filter out uncomfortable shareholders' questions ('cherry picking') and thus avoid shareholders' scrutiny.[14] Our evidence is not consistent with this argument, for three reasons. First, while VSM are less likely to have an active Q&A (i.e. at least one question), conditioned upon an active Q&A, the number of questions is *similar* to, rather than *lower* than, in-person meetings. Under the 'cherry picking' story, one would expect a lower number of questions across the board. A potential counterargument is that we only observe the questions asked at the meeting (as reported in the transcript) but we do not observe the questions *submitted* by shareholders via chat and deliberately ignored by management. In other words, perhaps VSM meetings do lead to more submitted questions (reflecting a larger audience) but management chooses to answer only the more lenient ones (and the number of questions *answered* in VSM happens to be similar to the number of questions *submitted* at in-person meetings). However, our estimated number of questions addressed at the meeting (based on transcripts) for VSM in 2020 (4.8, see Table 7 Panel A) is in line

[13] Our measure of tone is based on the number of positive words minus number of negative words divided by total number of words, which may lead to greater negative tone simply because the number of (neutral) words is shorter in VSM (more concise questions). However, the results are similar when using two measures not affected by this denominator problem: the difference between positive and negative words, either unscaled or scaled by the number of positive plus negative words.

[14] Under this interpretation less frequent, shorter and more generic presentations may be characterized as another means to deter questions and scrutiny. However, in untabulated tests we find that, while positively associated with the likelihood of an active Q&A, the presence and length of a business presentation are not associated with the number of questions conditional upon an active Q&A.

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with the average number of *submitted* questions (four) reported in Broadridge (2020) for a sample of almost 2,000 VSM in 2020 (Broadridge does not share firm-level data on the number of submitted questions due to confidentiality agreements with their clients).[15]

Second, the 'cherry picking' story is unlikely to explain the lower likelihood of having at least one question (*Active Q&A*). While it is plausible that in VSM management chooses to address only *some* questions (e.g. the less hostile ones), it seems implausible that it would ignore *all* questions by (falsely) stating that there are no questions and closing the Q&A session – such behavior would trigger loud complaints by shareholders who submitted questions.

Finally, the 'cherry picking' explanation is also inconsistent with four pieces of evidence: (i) VSM exhibit a markedly more negative tone of questions, on average;[16] (ii) VSM exhibit a higher percentage of questions with 'extremely' negative tone (defined as the bottom quartile of the tone distribution in the full sample – untabulated tests), inconsistent with management filtering out the most negative questions; (iii) in VSM there is no significant difference in tone between the first and last question, inconsistent with management picking the most friendly questions first and trying to 'run out of time' before the most challenging ones; (iv) in VSM executives' answers are not shorter nor less specific, as one would expect if management was trying to minimize interactions with shareholders.

Given all the above discussion, how to explain the reduced likelihood of an active Q&A? We conjecture that at firms with low Q&A activity to start with, the (few) questions were probably asked by local retail shareholders who stop participating when the meeting is virtual because the technology is too complicated and does not provide them with the same gratification as the in-person experience

[15] Schwartz-Ziv (2021) reports that two "gadfly" activist investors received an answer to only 142 of the 390 questions they submitted to 60 firms with a VSM in 2020 (comparable data for in-person meetings are not reported). The large discrepancy between submitted and answered questions for these two investors is inconsistent with the fact that our estimates of the number of questions addressed at the meeting is in line with the number of submitted questions as per Broadridge reports. We conjecture that the two gadflies represent an outlier and that they received a low response rate because at most firms the rules of conduct limit the number of questions per shareholder to one or two (see Appendix 4). This holds true in both in-person meetings and VSM. Consistent with our conjecture, in two anecdotes provided by Schwartz-Ziv (2021) two of the 8 and 9 questions submitted by the two gadflies were answered, while the rest was not. Note that even if shareholders choose to stay anonymous, they are assigned an ID, and thus the firm can see whether the same shareholder is submitting multiple questions.

[16] The more negative tone also runs counter to the idea that executives "water down" shareholder's questions either by rephrasing or strategically combining them during VSM.

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(e.g. psychological rewards of asking questions live in front of management and other shareholders, opportunity for off-line conversations). In partial support for this conjecture, we find that among 28 firms with no questions in their VSM (from Table 5 Panel C) and transcripts' data for their prior in-person meeting, the number of questions at such in-person meetings was only 1.45, on average.

To sum up, our evidence suggests that VSM adopting firms choose this format not to offer more information to a larger audience, but rather to keep the meeting as concise as possible - as reflected by their decision to reduce the length and specificity of the business presentation (or to remove it altogether). As for the Q&A section, it does not appear that management exploits the format to avoid questions and reduce interactions with shareholders, contrary to the concerns expressed by critics. At the same time, though, it is perhaps even more noteworthy that the larger audience of VSM does not seem to translate to a higher level of Q&A activity. This may be either because shareholders joining annual meetings for the first time when held virtually are not interested in submitting questions, or because their questions are "offset" by a reduced number of questions from retail shareholders who stop attending the meeting when no longer in-person.

5.4 Effect on the activity at the annual meeting: evidence from forced adopters

Due to the restrictions imposed by Covid, over 2,000 firms were forced to hold a VSM during the 2020 proxy season (Rutgers Center 2020). This "exogenous" shock allows for better causal identification of the effects of the virtual format on the meeting's activity, but also presents some drawbacks. "Forced" adopters and their investors had little time to prepare and get comfortable with the technology, which may limit the generalizability of the findings. Relatedly, the sudden increase in demand for VSM platforms led to the emergence of a dozen alternative platforms, with Broadridge's market share dropping from 95% to 60%, even though the number of meetings hosted by Broadridge increased five times. These platforms lack the functionalities offered by the long-tested Broadridge platform, which may affect the meeting dynamics.[17]

[17] Indeed, Schwartz-Ziv (2021) reports that two "gadfly" activist investors tried to submit questions to 89 firms with a VSM in 2020 but were not able to do so at 28 of them. It turns out that 27 of these 28 firms were using platforms other than Broadridge. These alternative platforms have a cumbersome process to confirm the identity of shareholders—a prerequisite for submitting questions (Rutgers Center 2020). In contrast, on the Broadridge platform

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Second, the identification benefits of the sample of forced adopters should not be overstated. While firms were forced to use the virtual format, they still retained (endogenous) discretion over the meeting design and whether to exploit the format for opportunistic reasons. In other words, the forced shift to a virtual format may "cause" a change in some meeting features (e.g. shorter questions due to the use of the chat), but not in all of them (e.g. the content of the business presentation and the decision to 'cherry pick' questions remain endogenous). Thus, we view the Covid-induced sample of forced adopters as complementing (rather than replacing) our previous analyses based on voluntary adopters.

To examine this sample, we apply the same algorithm to the Capital IQ transcripts of annual meetings taking place during the 2020 proxy season up to the end of November (but post-Covid, i.e., starting in April) and perform a difference-in-difference analysis, comparing changes in meetings' content of 145 firms forced to switch from the in-person format in 2019 to the VSM format in 2020, relative to the control sample of 129 firms that were already voluntarily using a VSM format in 2019 and continued to do so in 2020 (the sample size of forced adopters reflects the limited availability of transcripts for in-person meetings in 2019). Since both treated and control firms were exposed to Covid, this approach should largely control for any change in meeting activity due to Covid itself.[18]

As shown in Table 7, Panel A, forced adoption of VSM led to shorter meetings, due to a slightly shorter A&P section, and shorter questions. However, in contrast to the sample of voluntary adopters, we find no evidence of a change in the frequency and properties of the business presentations, and in the likelihood of an active Q&A. Similar to the sample of voluntary adopters, in VSM the tone of shareholder questions is more negative, and the number of questions does not differ. Notably, the executive answers' tone is more positive. The findings are subject to the caveat that "treated" firms (forced adopters) are significantly larger than the control sample of firms with a VSM in both 2019 and 2020 (total assets of $42.5 vs. $13.9 billion). To ensure differences in size (and other characteristics

the process is smooth because linked to Broadridge's proxy voting infrastructure. In the 2021 proxy season these differences across platforms appear to have been addressed.

[18] On one hand, as firms and investors prioritized other concerns, activity at the 2020 annual meetings may have been unusually low. On the other hand, sophisticated investors hungry for information about the firm-specific impact of Covid may have used the annual meeting to get updates relative to the last conference call or investor conference, thereby resulting in unusually high participation and Q&A activity. Either way, these effects should be partially controlled by our research design.

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related to size) do not affect our inferences, in Panel B we repeat the test using a size-matched control sample. The findings are generally similar, except that there is no change in the tone of executive answers. Finally, in Panel C and D we run a difference-in-difference multivariate regressions controlling for size and other firm and meeting characteristics. The most notable difference is that the forced shift to a virtual format is associated with an *increase* in the number of questions (see column 3 of Panel D), consistent with greater shareholder attendance leading to more questions.

When combined with the findings from the sample of pre-Covid voluntary adopters, the picture that emerges is the following. First, the shift to VSM meetings is associated with less frequent, shorter and less specific business presentations *only* among voluntary adopters, suggesting it is an endogenous effect. In other words, these firms view the meeting as a compliance exercise to be performed 'efficiently'– hence, their choice to adopt the virtual format and reduce (or eliminate) the business presentation. Forced adopters held a VSM out of necessity and thus continued to offer the same information as in their in-person meetings. Notably, though, neither group took advantage of the potential larger audience to offer a more comprehensive and detailed business update.

Second, the shift to VSM meetings is associated with shorter shareholders' questions and significantly more negative tone in *both* samples, suggesting that (in contrast to the business presentation results) this is not an endogenous effect, but rather the effect of the online technology per se (e.g. use of chat leading to more concise questions and allowing for more aggressive questions).

Finally, there is no reduction in the level of Q&A activity among forced adopters, suggesting that these firms did not opportunistically exploit the virtual format to limit shareholders' ability to ask questions. If anything, the number of shareholder questions increased. We also found little evidence of a reduction in Q&A activity among voluntary adopters (see discussion in Section 5.3). Moreover, in both samples, executives' answers are neither shorter nor less specific after the shift to the virtual format. Overall, these combined findings do not support the contention that (whether voluntary or forced) the use of the virtual format at the annual meeting results in diminished shareholder rights.

5.5 Effect on the information content of the annual meeting: evidence from market-based measures

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In Section 5.1-5.4 we examined the effect of the meeting's format on the activity at the meeting. In this section we examine investors' perceptions of the meeting's information content. In particular, we analyze whether the meeting format affects common market-based measures of information content, such as abnormal trading volume and absolute abnormal returns.[19]

Our previous analyses indicate that VSM and in-person meetings differ in terms of activity. If shorter and more generic business presentations (or lack of a presentation), the lack of active Q&A or shorter shareholders' questions deprive market participants of important information, all else being equal, VSM should exhibit lower information content. At the same time, practitioner reports indicate greater attendance at VSM (Optimizer, 2020). In turn, greater attendance implies that a higher number of investors may be using information from the meeting, if they view the information as value-relevant, potentially leading to an increase in market-based proxies of information content. This is especially true if reduced activity at VSM reflects a more efficient meeting rather than lower information content. Moreover, more aggressive shareholders' questions may elicit more informative answers. Ultimately, thus, the effect of VSM on market-based proxies for information content is an empirical question.

We first examine this question in the sample of voluntary VSM adopters in the pre-Covid period. In Table 8, Panel A, we compare VSM and two samples of in-person meetings (the full sample and a size-matched sample) in terms of abnormal trading volume and absolute abnormal returns on the meeting date. While both types of meetings are associated with significantly positive abnormal absolute returns and trading volume, there is no significant difference based on the meeting's format. Next, in Panel B we report the change in information content for first-time VSM adopters (i.e. the change from the last in-person meeting to the first VSM) relative to a size-matched sample of firms with in-person meetings in both years. The difference-in-differences is not significant. The results are similar when controlling for the number of days from the latest earnings announcement, which may affect the information content of the meeting. Overall, these analyses suggest that the adoption of

[19] Trading volume and return magnitude are two complementary measures of information content. Following theoretical models from Kim and Verrechia (1991a, 1991b, 1997), we interpret trading volume as disagreement among traders about the implications of the annual meeting for firm value, and absolute returns as the amount of consensus belief revision induced by the annual meeting.

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VSM—in spite of their reduced activity—is not associated with a significant change in market perceptions of the information content of the meeting.

As noted above, two forces (greater attendance and reduced activity) may push in opposite directions and offset each other. To disentangle them, in Panel C we run multivariate regressions where we control for the level of activity at the meeting, using the meeting duration (column 1 and 4) or, alternatively, various measures of meeting activity in terms of business presentation and Q&A session (columns 2 and 3, and columns 5 and 6), as well as a series of firm and meeting characteristics. Because we control (albeit imperfectly) for the level of activity at the meeting, in these specifications the indicator for VSM should capture the effect of greater attendance (which we do not observe). In other words, we ask the following question: after controlling for their shorter duration or the reduced activity, are VSM more informative because of their greater reach? Using both proxies, the coefficient of *Virtual* is not significant, suggesting the additional "attendance" associated with the virtual format does not impact information content proxies. Meetings with a business presentation and more specific answers are associated with both significantly greater absolute CAR and trading volume, and longer meetings with significantly greater trading volume, while most other variables do not load.

From a Merton (1987) perspective, the fact that VSM have greater attendance than in-person meetings and yet do not elicit greater market reactions is puzzling. However, "attendance" at in-person meetings is potentially understated if those meetings are streamed in real-time. To address this issue, we search for the words "audiocast" and "webcast" in proxy filings and transcripts of the in-person meetings included in Panel C, finding that 40.8% offered a live webcast, and then we perform two tests. First, in untabulated tests we re-run Panel C only for the sample of in-person meetings, adding an indicator for the presence of a webcast. We find a significantly positive association between the presence of a webcast and both abnormal trading volume and abnormal absolute returns, consistent with the intuition (based on Merton 1987) that greater 'attendance' of annual meetings (as proxied by a live webcast) is associated with greater information content. Second, we re-run the regressions from Panel C *without* in-person meetings with a live webcast, to more cleanly capture the effect of greater attendance in VSM. The results reported in Panel D indicate that VSM are associated with significantly

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greater abnormal absolute returns by about 20 basis points on average, while there is no difference in abnormal trading volume.[20] Overall, these tests are consistent with greater attendance of annual meeting (via VSM or a live webcast) being associated with market proxies of information content.

Finally, we examine the post-Covid period, when the adoption of VSM was forced. In Panel E we run a multivariate difference-in-differences regression where *Treatment* is equal to one for forced adopters (firms with in-person meeting in 2019 and a VSM in 2020 post-Covid) and *Post* is equal to one for post-Covid meetings in 2020. The control sample includes firms voluntarily holding a VSM in both 2019 and 2020. For both market-based measures of information content, the difference-in-differences are not significantly different from zero.[21]

Overall, the reduced level of activity at VSM does not appear to affect market perceptions of the meeting's information content. At the same time, there is some evidence that greater participation via the virtual format translates to greater information content, relative to in-person meetings without a webcast or audiocast. Future research can explore whether greater familiarity with the VSM format post-Covid and suggested improvements to VSM platforms (e.g. greater use of video, chat rooms; Rutgers Center 2020) will lead firms and investors to take better advantage of this new communication channel. Along these lines, comparing a similar sample of about 2,000 VSM, Broadridge (2021) reports that the number of submitted questions during the meeting increased from four in 2020 to seven in 2021.

6. Conclusions

Over the last decade a growing number of firms have held their annual shareholder meeting online (so-called "virtual" meetings). The emergence of Covid-19 in 2020 has forced almost every firm to adopt such virtual format, both in the US and internationally. Concerns have been raised, however, as to whether the virtual format, while making attendance easier, is used by management to control the

[20] The different findings between absolute returns and trading volume may be interpreted as VSM being associated with greater changes in consensus rather than greater disagreement among investors (Kim and Verrecchia 1997).

[21] In untabulated tests we exclude in-person meetings with a webcast from the "pre" period treatment group, but we continue to find no effect of VSM, possibly due to limited power of the test (relatively small sample of in-person meetings without a webcast in the year prior to Covid, combined with investors trading mostly in response to macroeconomic news during the post period, i.e., during the first months of Covid).

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Q&A activity and limit shareholder rights to express their views at the meeting. More generally, it is unclear whether a virtual format hampers or enhances the information content of shareholder meetings.

We investigate these questions using a large sample of voluntary (pre-Covid) and forced (Covid-induced) sample of virtual shareholder meetings (VSM). Voluntary adopters of VSM tend to be tech firms and firms traditionally more engaged with shareholders, consistent with the stated objective to increase shareholder participation, while there is little evidence that firms choose this format to avoid shareholders' scrutiny. Textual analysis of transcripts suggests that virtual meetings are overall shorter, with less frequent, shorter, and less detailed business presentations, but only among voluntary adopters, suggesting that these properties reflect a firm's choice rather than a byproduct of the virtual format per se. Among both voluntary and forced adopters, the likelihood of questions from shareholders is also lower, but conditioned upon having one question, the number of questions is similar and the tone more negative, inconsistent with claims that managers exploit the virtual format to reduce engagement with shareholders or filter out more hostile questions. Finally, there is some evidence of greater abnormal absolute returns around VSM, supporting the notion that greater attendance translates into greater information content.

Overall, our study finds that VSM exhibit less activity on average, consistent with critics' concerns, but such reduced activity does not appear to cause a loss in information content nor to reflect an attempt to avoid scrutiny. Thus, concerns about negative effects of VSM on shareholder rights appear to be overstated.

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Appendix 1 – Firms' disclosures about virtual shareholder meetings (VSM)

1.A Rationale for virtual format: cost savings, participation, technology focus, environmental impact

"We have elected to conduct our 2019 Annual Meeting in a virtual format in order to better facilitate stockholder participation by enabling stockholders to participate fully, and equally, from any location at no cost. We believe this approach increases our ability to engage with all stockholders, regardless of size, resources or physical location, and also provides cost savings for the company. We have designed this virtual format to enhance, rather than constrain, stockholder access, participation and communication. For example, the online format allows stockholders to communicate with us in advance of, and during, the meeting so they can ask any questions of management and our Board of Directors." (*Granite Point Mortgage Trust, Proxy Statement, April 3, 2019*)

"Our virtual shareholder meeting format uses technology designed to increase shareholder access, save the Company and our shareholders time and money, and provide our shareholders rights and opportunities to participate in the meeting similar to what they would have at an in-person meeting. In addition to on-line attendance, we provide shareholders with an opportunity to hear all portions of the official meeting as conducted by the Chairman of the Board and the Corporate Secretary, submit written questions and comments during the meeting, and vote on-line during the open poll portion of the meeting." (*Quintana Energy Services, Proxy Statement March 19, 2019*)

"Since our stock ownership is mainly held by large institutional investors, with only routine matters typically being addressed at the meeting, virtual-only meetings offer significant time and cost savings to both the Company and its investors. Organizing and conducting a traditional stockholder meeting, attended by only a handful of people, requires the efforts of approximately 15-20 additional employees and contractors beyond those who now support our Board and virtual meetings. In addition, holding the meeting virtually allows us to make much more efficient use of the time of our independent directors, who are in our offices for a limited time for the related meeting of our Board of Directors. (*Dennys, Proxy Statement March 29, 2019*)

"One of the steps we will take again this year to reduce operating expenses is to hold a virtual audio Annual Meeting via the Internet, rather than at a rented facility. (*Pico Holdings, Proxy Statement April 2, 2014*)

"As a leading provider of cloud-based technology solutions, we are pleased that this year's annual meeting will again be a completely virtual meeting of stockholders." (*Medidata Solutions, Proxy Statement April 21, 2016*)

"...virtual meeting is aligned with our vision and values as a leading provider of cloud communications services for businesses and consumers." (*Vonage Holdings, Proxy Statement April 25, 2018)*

"...As a technology leader, conducting our annual meeting virtually is consistent with our approach of connecting technology and consumers and provides resource efficiencies." (*Best Buy, Proxy Statement May 1, 2017*)

"Hosting our meeting virtually...also aligns with our strategic corporate goal to lead with digital and our broader sustainability goals." (*Ralph Lauren, Proxy Statement June 21, 2019*)

"This year's annual meeting will be online and a virtual meeting of stockholders to enable stockholder participation while saving the Company's and the investors' time and money and reducing our environmental impact.' (*Keurig Dr Pepper, Proxy Statement April 25, 2019*)

"Hosting the Annual Meeting virtually...also aligns with the Company's broader sustainability goals. The virtual meeting has been designed to provide the same rights to participate as you would have at an in-person meeting, including providing opportunities to make statements and ask questions." (*Annaly Capital Management, Proxy Statement April 10, 2018*)

"We avoid the time, effort and elevated expenses of organizing physical meetings which historically have been attended by only a few stockholders; our stockholders who wish to attend our annual meeting do not need to incur travel and other costs to do so; and we reduce the environmental impact our annual meetings have by cutting transport and related carbon emissions, paper materials, and other negative impacts necessarily a part of a physical meeting" (*Store Capital, Proxy Statement April 18, 2019*)

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"Intel has for years been a leader in the use of technology to improve and broaden stockholder communications. This has made it possible for more people to have direct access to information sooner, while saving the company and investors time and money. As physical attendance at meetings has dwindled, web participation has grown significantly, and has proven to be substantially more popular than physical attendance. With the technology well established, this year we are pleased to be able to provide a completely virtual Annual Stockholders' Meeting." (*Intel Corp., Proxy Statement, April 4, 2016*).

(Note: Intel had tried to switch to a VSM already in 2010 but did not go forward with the plan due to shareholders' opposition. In conversations with the authors, Broadridge representatives noted that in the early years they promoted the hybrid format to help clients familiarize with the technology before embracing a fully virtual format)

1.B Increased attendance under a virtual format relative to in-person meetings

"Why a Virtual-Only Meeting? Denny's conducted virtual-only annual stockholder meetings in 2016, 2017 and 2018 and will do so again in 2019. The decision to continue to conduct virtual-only annual stockholder meetings is driven by a number of factors discussed below.

Denny's ownership is closely held. Currently approximately 75% of Denny's outstanding common stock is held by 20 institutional stockholders, and approximately 85% is held by 40 institutional stockholders. We maintain an active dialogue with our institutional stockholders particularly following our year-end earnings release in February of each year. Over the last five years that we conducted meetings with the traditional meeting format, only once did any of our top 40 stockholders attend our annual meeting. Conducting the annual meeting virtually increases the opportunity for all stockholders to participate and communicate their views to a much wider audience.

Minimal stockholder attendance when we utilized the traditional meeting format. Over the last five years that we conducted traditional annual meetings, we had only three retail stockholders (aside from employees and directors) who regularly attended our annual stockholders meetings. Our total stockholder attendance from 2011 to 2015 (aside from employees and directors) dwindled from eight to three. Our regular attendees have continued to participate in the virtual-only meetings the last three years, with two of the three asking questions or making comments at the 2017 meeting and one asking a question at last year's meeting... (*Dennys, Proxy Statement March 29, 2019*)

"Last year was the first year that we hosted our Annual Meeting exclusively [online]...As a result of the online format, we were able to connect with twice as many participants than in previous years. We were also able to answer more questions than at previous meetings by posting answers to our website to any questions that we did not have time to answer during the meeting." (*Duke Energy, Proxy Statement March 22, 2018*)

"While our Annual Meeting of Shareholders is just one of the forums where we engage with shareholders, it is an important one. Physical attendance at our meetings was dwindling prior to our adoption of a virtual only annual meeting and participation has subsequently increased... (*Fuller H B Co., Proxy Statement February 20, 2019*)

"We began holding our Annual Meeting online in 2013. At that time, we considered a number of factors, including the technologies available to us, the cost of our Annual Meeting, and the historical level of stockholder attendance in person... only a very small number of stockholders, generally less than ten each year, attended our Annual Meeting in person. When we considered implementing a fully virtual Annual Meeting in 2013, we reached out to a number of our stockholders and received extensive support. We continue to receive positive feedback from our stockholders as we adopt best practices" (*Ciena, Proxy Statement, February 8, 2017*)

"We have held our annual meetings of stockholders virtually since 2017...for a number of reasons, including: ...the attendance at our most recent in-person stockholder meetings was low, consisting of an average of 12 stockholders who attended each of our most recent three meetings in person... Despite these historically low in-person attendance levels, offering in-person access to our stockholder meetings can involve significant costs, including monetary expenses and increased management and employee time... Attendance at our stockholder meetings held in 2017 and 2018, both of which included a virtual component, increased substantially. The number of stockholders who attended each of these meetings via the Internet rose to an average of 57 stockholders per meeting (*Clean Energy Fuels, Proxy Statement April 5, 2019*)

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1.C Mechanics of virtual meetings: shareholder rights, Q&A sessions, rules of conduct

"Our virtual annual meeting allows stockholders to submit questions and comments before and during the meeting. After the meeting, we will spend up to 15 minutes answering stockholder questions that comply with the meeting rules of conduct; the rules of conduct will be posted on the virtual meeting web portal. To the extent time doesn't allow us to answer all of the appropriately submitted questions, we will answer them in writing on our investor relations website soon after the meeting. If we receive substantially similar questions, we will group such questions together and provide a single response to avoid repetition". (*Glaukos, Proxy Statement April, 17, 2019*)

"In order to encourage shareholder participation and transparency, CSX will (i) provide shareholders with the ability to submit appropriate questions in advance of the Annual Meeting to ensure thoughtful responses from management and the Board; (ii) provide shareholders with the ability to submit appropriate questions in real-time during the Annual Meeting either via telephone or the virtual meeting website; (iii) provide management with the ability to answer as many questions submitted in accordance with the meeting rules of conduct as possible in the time allotted for the Annual Meeting without discrimination; and (iv) publish all appropriate questions submitted in accordance with the Annual Meeting rules of conduct with answers following the Annual Meeting, including those not addressed directly during the Annual Meeting." (*CSX Corp, Proxy Statement March 22, 2019*)

"We are aware of concerns that virtual meetings may diminish stockholder voice or reduce accountability and are taking steps to address these concerns. ...During the live Q&A session, we will answer questions as they come in, as time permits. We are committed to publishing and answering each question received following the Annual Meeting. Although the live webcast is available only to stockholders at the time of the Annual Meeting, the webcast of the Annual Meeting will be archived for one year after the date of the Annual Meeting
(*Ultragenyx Pharmaceutical, Proxy Statement April 22 2019)*

"This is the fourth year we have conducted an exclusively virtual annual meeting...We are aware of members of the investor community who believe that virtual annual meetings do not present sufficient opportunities for stockholders to interact with directors and management. While our stockholders, on the whole, have not expressed concern about our virtual meetings, our Board intends to continue carefully reviewing and considering alternative meeting platforms for future annual meetings" (*True Car Proxy Statement, April 3, 2019*)

"As a result of positive feedback from our shareholders, we are excited to once again hold this year's annual meeting virtually, as we have done since our IPO in 2013. The Board intends for the virtual meeting format to provide shareholders with an enhanced level of transparency and participation compared to the traditional in-person meeting format, and the Company has taken the following steps to ensure such an experience:

- Providing shareholders with the ability to submit appropriate questions ahead of the meeting through the virtual meeting web portal;
- Providing shareholders with the ability to submit appropriate questions during the meeting either through the virtual meeting platform or via telephone;
- Answering as many questions submitted in accordance with the meeting rules of conduct as possible in the time allotted for the meeting without discrimination; we have posted the rules of conduct on the virtual meeting web portal;
- Publishing all appropriate questions that cannot be answered during the meeting due to time constraints with answers following the meeting and
- Providing technical support through dedicated phone lines before and during the meeting"

(*Voya Financial, Proxy Statement April 10, 2019*)

"Virtual meetings give stockholders more options to pose their questions to management. Stockholders can submit questions in advance in order to get a better-formulated response, or ask tough questions anonymously that they would be hesitant to ask face-to-face... (*Dennys, Proxy Statement March 29, 2019*)

"...we believe the virtual nature of the Annual Meeting will not decrease engagement capabilities and could facilitate increased stockholder participation with the ability to submit comments and questions anonymously if a stockholder desires to do so. (*Clean Energy Fuels, Proxy Statement April 5, 2019*)

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Appendix 2 – Variables definitions and data sources

Key variables of interest

VSM (Virtual Shareholder Meeting)	Annual shareholder meeting where shareholders are able to participate (i.e. attend, submit questions and, if desired, vote) exclusively online via the Internet.
Hybrid (Hybrid Shareholder Meeting)	Annual shareholder meeting where shareholders are able to participate (i.e. attend, submit questions and, if desired, vote) both in person and online via the Internet.

Firm Characteristics (Table 2-3 and Table 6-8)

Total Assets	AT from Compustat North America Fundamentals Annual, at the end of the fiscal year prior to the annual meeting, accessed via WRDS.
Market Cap	Fiscal Year-End Stock Price (PRCC_F) * Common Shares Outstanding (CSHO) from Compustat North America Fundamentals Annual, at the end of the fiscal year prior to the annual meeting, accessed via WRDS. Log transformed in regressions.
MTB	*Market Cap* divided by common stockholder equity (CEQ) from Compustat North America Fundamentals Annual, at the end of the fiscal year prior to the annual meeting, accessed via WRDS.
ROA	Earnings Before Interest and Taxes (EBIT) divided by Total Assets (AT) from Compustat North America Fundamentals Annual, at the end of the fiscal year prior to the annual meeting, accessed via WRDS.
Stock Returns	360-day buy-and-hold return (RET) net of the CRSP value-weighted index return (VWRETD) ending 120 after the fiscal year end prior to the annual meeting, accessed via WRDS.
SG&A	SG&A expense (XSGA) divided by total revenue (REVT) from Compustat North America Fundamentals Annual, for the fiscal year prior to the annual meeting, accessed via WRDS.
#Institutions	Total number of unique institutional holders (MGRNO) based on 13-F filings from Thomson Reuters as of the end of the fiscal year prior to the annual meeting, accessed via WRDS.
Engagement	First factor from a factor analysis of guidance issuance and investor conference attendance. Guidance issuance is the number of key developments flagged as "Corporate Guidance" in Capital IQ during the fiscal year prior to the annual meeting. Investor conference attendance is the number of key developments flagged as "Company Conference Presentations" in Capital IQ during the fiscal year prior to the annual meeting.
Media Sentiment	Number of positive news articles minus number of negative news articles scaled by total number of news articles published within a year prior to the annual meeting, as per RavenPack. Only articles with a relevance score of at least 75 are included.
Litigation	Indicator for firms subject to the filing of at least one Rule 10b-5 securities class action during the year ending three months after the end of the fiscal year prior to the annual meeting, as per the Stanford Securities Class Action Clearinghouse, accessed at http://securities.stanford.edu/.

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ContentiousPast (Contentious)	Indicator for firms where the previous (upcoming) annual meeting meets at least one of the following criteria: (i) a third or more of directors up for election receiving less than 90% voting support, (ii) one or more management proposals receiving less than 80% voting support, (iii) one or more shareholder proposals receiving more than 45% voting support, (iv) the firm requests at least one shareholder proposal to be excluded from the meeting in accordance with Rule14a-8, accessed via the Securities and Exchange Commission website at https://www.sec.gov/corpfin/shareholder-proposals-no-action. Data on shareholder voting is obtained from ISS Voting Analytics, accessed via WRDS.
BdIndep	Percentage of directors who are classified as independent, as per BoardEx.
%InstOwn	Percentage of shares outstanding held by institutions, based on 13-F filings from Thomson Reuters as of the end of the fiscal year prior to the annual meeting, accessed via WRDS.
Tech	Indicator for firms with three-digit SIC codes 737 or 738 from Compustat North America Fundamentals Annual, at the end of the fiscal year prior to the annual meeting, accessed via WRDS.
#SameDay	Number of annual shareholder meetings held on the same day as the focal firm as per ISS Voting Analytics, accessed via WRDS.
# Shareholder Proposals	Number of shareholder proposals on the ballot at the annual shareholder meeting, as per ISS Voting Analytics, accessed via WRDS.

Meeting Characteristics based on Transcripts' Analysis (Table 5-8)

Duration	Length of the annual shareholder meeting's recording, in minutes, as per Capital IQ. Log transformed in regressions.
A&P Length	Total number of words spoken during the agenda and presentation part of the annual shareholder meeting, as per Capital IQ.
Business Presentation (BP)	Indicator equal to one if the Agenda & Presentation section of the transcript of the annual shareholder meetings include a business presentation by management. Appendix 3 describes the algorithm used to identify the presence of a business presentation.
Business Presentation (BP) Length	Total number of words spoken during the business presentation section of the annual shareholder meeting, identified as per Appendix 3. Log transformed in regressions.
Business Presentation (BP) Tone	Number of positive words minus number of negative words divided by total number of words in business presentation section of the annual shareholder meeting, identified as per Appendix 3. Positive and negative words are from the Loughran and McDonald sentiment word list, available at https://sraf.nd.edu/textual-analysis/resources/ See Appendix 3 for details on the identification of the questions' (answers') portions of the transcripts.
Business Presentation (BP) Specificity	The number of entities (people, organizations, locations, numbers, dollar amounts, dates, etc.) mentioned in the business presentation section text, identified using spaCy natural language processing tool (see Hope et. al (2016) for more details).
Q&A Length	Total number of words spoken during the Questions & Answers section of the annual shareholder meeting, as identified in Capital IQ (i.e. all

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	segments labeled as "Questions" or "Answers"). Note this is not simply the sum of Questions' Length and Answers' Length, because it also includes any comments by meetings' participants and executives which do not formally constitute a question or an answer based on our definitions in Appendix 3.
# Questions	Total number of questions asked by shareholders at the annual meeting, based on keyword and punctuation search within transcripts provided by Capital IQ. See Appendix 3 for details on the identification of the questions' (answers') portions of the transcripts.
Active Q&A	Indicator equal to one if there is at least one question from shareholders at the annual shareholder meeting, and zero otherwise. See Appendix 3 for details on the identification of the questions' (answers') portions of the transcripts.
Questions' Length (Answers' Length)	Total number of words per question asked (answer given) during the questions' (answers') portion of the annual shareholder meeting, based on transcripts provided by Capital IQ.
Questions' Tone (Answers' Tone)	Number of positive words minus number of negative words divided by total number of words in the questions (answers) portion of the annual shareholder meeting, based on transcripts provided by Capital IQ. Positive and negative words are from the Loughran and McDonald sentiment word list, available at https://sraf.nd.edu/textual-analysis/resources/ See Appendix 3 for details on the identification of the questions' (answers') portions of the transcripts.
Questions' (Answers') Specificity	The number of entities (people, organizations, locations, numbers, dollar amounts, dates, etc.) mentioned in the text of questions (answers), identified using spaCy natural language processing tool (see Hope et. al (2016) for more details).

Market-based variables (Table 4 and Table 8)

CAR	Three-day cumulative abnormal returns (*CAR*) centered around the proxy statement filing date ahead of the annual shareholder meeting. Daily abnormal returns are the firm's stock return (RET) minus that on the CRSP value-weighted index (VWRETD), accessed via WRDS.
Absolute CAR	Absolute value of the abnormal return (CAR) on the annual shareholder meeting.
Trading Volume	Trading volume (VOL) scaled by shares outstanding (SHROUT) on the annual shareholder meeting, net of the same measured over the sixty calendar days (except those within one day of an earnings announcement) ending four days before the annual meeting. Based on CRSP data accessed via WRDS.
CAR 60 Days Past	The average daily CAR over the sixty calendar days (except those within one day of an earnings announcement) ending four days before the annual meeting Daily abnormal returns are the firm's stock return (RET) minus that on the CRSP value-weighted index (VWRETD), accessed via WRDS.

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Appendix 3 – Description and validation of the algorithms used to code the text of annual shareholder meeting transcripts

The algorithms described below were initially developed after reading about one hundred transcripts and then refined various times after testing their accuracy in a hand-coded sample of over 500 transcripts (as described below).

Identifying questions and answers

We identify questions asked during the Questions and Answers (Q&A) portion of annual shareholder meetings using available Capital IQ transcripts of the meetings. Unfortunately, in these transcripts Capital IQ does not classify questions text as "questions" but marks all text segments in Q&A as "answers". Therefore, we employ automated textual analysis methods to identify questions asked in the meetings. There is a difference in how questions are asked in in-person and virtual shareholder (VSM) meetings. In in-person meetings, questions are typically asked directly by shareholders. Therefore, CapitalIQ, in its transcripts, attributes the text of these questions to "shareholder portion" of Q&A. In VSM, questions are submitted via chat are typically read by executives. As a result, CapitalIQ attributes the text to management portion of Q&A. There are also cases when management reads pre-submitted shareholder questions in in-person meetings. Therefore, we employ a textual analysis algorithm with two separate procedures: one to identify questions asked by shareholders (i.e., a typical scenario for in-person meetings), and the other to identify questions read by management (i.e., for VSM). Since the algorithm can identify both types of questions we use the same algorithm for both in-person and VSM meetings.

To identify questions from shareholders, we first identify all paragraphs in text attributed by Capital IQ to shareholders. We mark a paragraph as a "question" if at least one of the last three sentences in that paragraph ends with a question mark, "?", and has more than five words (to avoid non-informative questions such as "Can you hear me?", "Can I ask a question?", etc.).

To identify shareholders' questions read by management, we first apply the same procedure (as described in the paragraph above) to text paragraphs attributed to management in Capital IQ. Nevertheless, management may read a question using language that does not need an explicit questions mark (e.g., "one of our shareholders is asking whether..."). To capture this type of indirect questions read by the management (i.e., questions that do not end with a question mark) we mark a management text paragraph as a question if one of its sentences contains a set of words (and their derivatives) from the list below. The words have to (1) be reasonably close to each other (within maximum of 5-20 characters depending on the word set) and (2) occur in the specified order:

(question, relate, to), (question, about), (question, is), (question, on), (question, reads), (question, ask), (shareholder, ask), (question, state), (shareholder, state), (question, elaborate), (shareholder, elaborate)

In addition, we do not classify a sentence as a question if it:

1) contains one of the following text strings: *"other questions", "any questions", "your question", "further question", "are there question", "are the comment",* or;
2) ends with one of the following text strings: *"okay?", "alright?", "yes?", "operator?", "sir?", "ma'm?", "question?", "questions?",* or;
3) ends with a capitalized word (that is likely to indicate a name, e.g., "Do you want to answer this question, John?").

After we identify all the questions in a transcript, we identify answers to questions by using the following algorithm. For each question, we classify as the "answer" the text by management that

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immediately follows this question and ends either before (1) the text of the next question or (2) the text of any comment by a non-executive.

Identifying business presentations

To identify a business presentation section, we search for management text segment in the Agenda and Presentation (A&P) Section in the transcript of an annual shareholder meeting that meets one of the following two criteria:

1) text contains dollar amounts and includes at least one word from the following accounting performance keyword list: *revenue, income, earnings, cash, growth, grew, quarter, expect; or,*

2) text contains a reference to a fiscal year, has at least three words from the above accounting performance keyword list, and contains at least 1,500 characters.

In our manual algorithm verification (reported below), we found that the first criterion captures business presentation sections that focus on accounting data and hard numbers with a high degree of accuracy. However, often management provides a "softer" (more qualitative) business presentation without specific dollar figures that we attempt to capture with the second criterion.

Testing the accuracy of the automated algorithms in a hand-collected sample

To estimate the accuracy of the algorithms described above, we hand-code 558 transcripts of annual shareholder meetings (145 in-person meetings and 413 VSM) taking place in 2019 and 2020 (this is the sample used in the analysis of forced VSM adoptions in Table 7). The table below reports the mean values of the following variables using the algorithm-based classification vs. the manual classification: *Business Presentation* indicator, *# Questions, Active Q&A* indicator, *# Questions (if Active Q&A=1).*

Appendix 3 - Table A – Sample of transcripts from VSM and in-person meetings.

Variable	Sample size	Manual Classification	Algorithm Classification	Difference	*t-stat*
Business Presentation (BP)	558	60.57%	59.50%	1.08%	0.366
# Questions	504	3	3.3	-0.3	-0.783
Active Q&A	504	51.39%	50.40%	0.99%	0.315
# Questions (if Active Q&A=1 in manual classification)	259	5.8	6.3	-0.5	-0.852

As shown above we observe no statistically significant differences in variable classifications between manual and automated data collection methods, as per two-tailed *t* test. Importantly, for the *Business Presentation* and *Active Q&A* indicator variables, manual classification and algorithmic classification agree 92.5% (97.5%) of the times (untabulated). For the sample with active Q&A, algorithmic and manual classification agree on the exact number of questions in 31.7% of all times and differ by only one (two) question(s) in 67.2% (81.5% of the times). Also, the average (median) absolute difference in the number of questions under the two classification is 0.46 (0). In general, the algorithmic classification results in a slightly higher number of questions because it aims to identify all questions asked, while manual collection better identifies unique questions only (i.e., without counting follow-up and clarifying questions). This is especially true for in-person meetings, where the shareholder at the microphone can ask follow-up, clarifying questions. However, importantly we do not observe a significant difference in the algorithm's accuracy between VSM and in-person meetings (reported below in Table B and Table C).

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Appendix 3 - Table B – Sample of transcripts from VSM

Variable	Sample size	Manual Classification	Algorithmic Classification	Difference	*t-stat*
Business Presentation (BP)	413	51.33%	50.85%	0.48%	0.139
# Questions	384	2.7	2.8	-0.1	-0.319
Active Q&A	384	45.05%	44.27%	0.78%	0.217
# Questions (if Active Q&A=1 in manual classification)	173	5.9	6.1	-0.2	-0.285

Appendix 3 - Table C – Sample of transcripts from in-person meetings.

Variable	Sample size	Manual Classification	Algorithmic Classification	Difference	*t-stat*
Business Presentation (BP)	145	86.90%	84.14%	2.76%	0.666
# Questions	120	4.0	4.8	-0.8	-0.853
Active Q&A	120	71.67%	70.00%	1.67%%	0.283
# Questions (if Active Q&A=1 in manual classification)	86	5.6	6.7	-1.1	-0.921

Note that in Table C the sample size for Active Q&A is smaller than for Business Presentation (N=504 vs. N=558). This is because only in 90% of our sample (504 observations), we can state with certainty that the Q&A portion of the call was included in the transcript in Capital IQ (thereby allowing us to code the Active Q&A variable as 1 or 0). As for the remaining 10%, in about half of them management mentions that the Q&A will be held after the formal meeting is over (but it was not included in the transcript) and in the other half we find no mention of Q&A in the transcript (thus it is unclear whether a Q&A section took place - but was not transcribed - or not). Hence, our algorithm may be coding as *Active Q&A*=0 cases where there was a Q&A but it was not reported in the transcript. The above problem is more frequent in in-person meetings (17% vs. 7% for VSM). Thus, the difference in frequency of *Active Q&A* reported in Table 5, if anything, is likely to be understated.

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Appendix 4 – Rules of Conducts for Annual Shareholder Meetings

Annual shareholder meetings have formal "rules of conduct", typically distributed to shareholders upon their arrival at an in-person meeting (in a VSM they are posted on the online platform – see for example: https://materials.proxyvote.com/default.aspx?docHostID=433743). Among other things, such rules determine the time reserved for Q&A (usually 15-30 minutes, depending on the size of the firm), the maximum number of questions per shareholder (usually one or two) and the type of questions allowed (only questions relevant to the matters discussed at the meeting). They also establish that the firm can combine similar, duplicate questions. As discussed below, the enforcement of these rules may be easier in virtual-only meetings, raising the question of whether they affect our comparison of the Q&A activity between virtual-only and in- person meetings. Below we assess the extent of this problem.

Fixed time for Q&A: it is harder to enforce Q&A time limits at in-person meetings when shareholders are lining up at the microphone. To the extent that the time limit is only binding in VSM, our analyses may under-state the number of questions in VSM relative to in-person meetings. Put it differently, in (some) VSM we may be missing (unobservable) questions which were submitted but not read and answered due to lack of time (and thus not reported in the transcript). Two observations suggest this is unlikely to be a serious problem for our analyses. First, if the number of questions at the first VSM was unexpectedly high (say, because of greater attendance) and some questions remained unanswered, one would expect firms to extend the length of the Q&A session over time, leading to an increase in the number of questions asked *during* the meeting. Yet, when we compare the content of the first and last VSM for firms with at least three VSM during our sample period (untabulated), the number of questions asked during the meeting is not significantly different. Second, in our hand-coded sample (Appendix 3) we collect data on how often firms explicitly state during the Q&A that they will post on the website answers to any question unanswered due to lack of time. While this occurs slightly more frequently in VSM (2.07% versus 0.69% of the meetings), the frequency is very low.

Maximum number of questions per shareholder: in in-person meetings it is harder to limit the number of questions per shareholder since the shareholder at the microphone may follow up with a second question after management' answer to the first question. Unfortunately, it is hard to directly assess the extent of this issue since in VSM management usually reads the questions without attributing them to a given shareholder and even in in-person meetings Capital IQ does not always provide a unique shareholder identifier. However, in our hand-coded sample we count the number of 'unique' questions (i.e. we exclude follow up clarifying questions from the same shareholder) and we continue to find a similar number of questions (conditional on an active Q&A) in VSM and in-person meetings (5.9 vs. 5.6 – see Appendix 3 Table B and C).

Duplicate questions: in VSM it is easier to combine duplicate questions because the firm can read them in advance in the chat. As a result, the number of questions in VSM reported in Table 5 is likely under-stated relative to in-person meetings. Indeed, based on our hand-coded sample of transcripts (Appendix 3) in meetings with an active Q&A, management explicitly states that some questions from shareholders are combined (because similar) in 21.4% of VSM, versus only 2.3% of the in-person meetings. While this difference appears large, its estimated impact on our analyses is minimal.[22]

[22] Consider the data in Table 5 Panel B. Out of 687 VSM, 153 meetings (22.27%) have an *Active Q&A*, averaging 4.2 questions, i.e. the total of questions captured by the algorithm is 642 (=153x4.2). If two questions were combined into

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Questions not pertinent to the meeting ("irrelevant" questions): Questions unrelated to the matters discussed at the meetings (e.g. personal grievances) are generally not allowed. More rarely, firms only allow questions relevant to the proposals being voted upon. During in-person meetings it is harder to avoid "irrelevant" questions, since the question is only heard when the shareholder is at the microphone (management can choose not to answer it, but the question will be asked and will be captured by our algorithm), while in virtual-only meetings the question is submitted via chat and management can choose not to read it (and thus will not be identified by our algorithm). As a result, the difference in *# Questions* between in-person and virtual-only meetings may be overstated. However, "irrelevant" questions are fairly rare: based on our hand-coded sample of transcripts (Appendix 3), only in 2.76% of in-person meetings management states that they decline answering a question because it violates the meeting's rules of conduct. The corresponding figure is 0% in virtual-only meetings, consistent with the notion that in such meetings management can simply avoid reading the question in the first place.

Overall, a stricter enforcement of the rules of conduct may result in under-stating the number of questions in VSMs relative to in-person meetings. While the impact should be small, the implication would be that VSM perhaps experience *more* questions than in-person meetings during active Q&As, consistent with their greater attendance. However, it is important to emphasize that rules of conduct cannot explain the observed *lower* likelihood of an *Active Q&A* (i.e. lower likelihood of at least one question) in voluntary VSM. For example, whatever the time allowed for Q&A, it will be enough to answer at least one question. Also, when duplicate questions are combined, or when shareholders are limited to a single question, there will be at least one question. The only case where *Active Q&A* may be affected is if the only question submitted is not pertinent to the meeting and management in VSM decides not to read it and address it. However, as noted above, the frequency of such questions is so rare that it cannot explain the large difference in likelihood of an *Active Q&A* documented in Table 5.

a single question in 21.4% of the cases (the figure based on our hand-collected data), then there would be an additional 33 questions (=21.4% x 153), raising the total to 675 questions and the average (from 4.2) to 4.4 questions (=675/153). Even if on average three questions were combined into a single question in 21.4% of the cases, there would be an additional 66 questions, raising the total to 708 questions and the average (from 4.2) to 4.6 questions. That is, the figure would still remain fairly close to the corresponding figure for in-person meetings (4.7).

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Figure 1A: Frequency of Virtual and Hybrid Shareholder Meetings pre-Covid

This figure plots the total number of annual shareholder meetings with a virtual component - virtual shareholder meetings (VSM) and hybrid shareholder meetings - held by U.S publicly traded corporations each year between 2001 and 2019. We identify VSM and hybrid meetings through keyword searches in proxy filings.

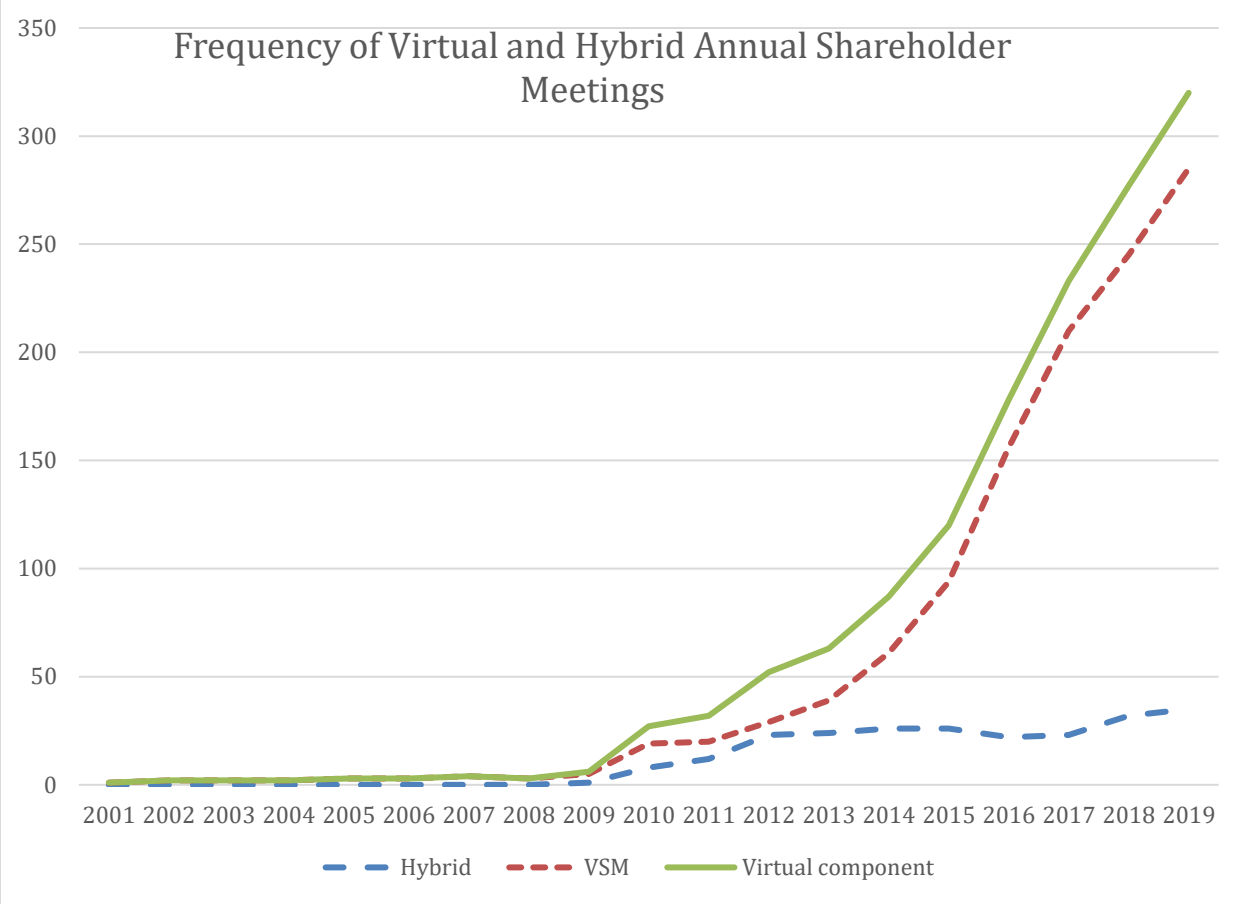

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Figure 1B: Frequency of First-Time Virtual and Hybrid Shareholder Meetings pre-Covid

This figure plots the total number of annual shareholder meetings with a virtual component - virtual shareholder meetings (VSM) and hybrid shareholder meetings - held for the first time by U.S publicly traded corporations each year between 2001 and 2019. We identify VSM and hybrid meetings through keyword searches in proxy filings.

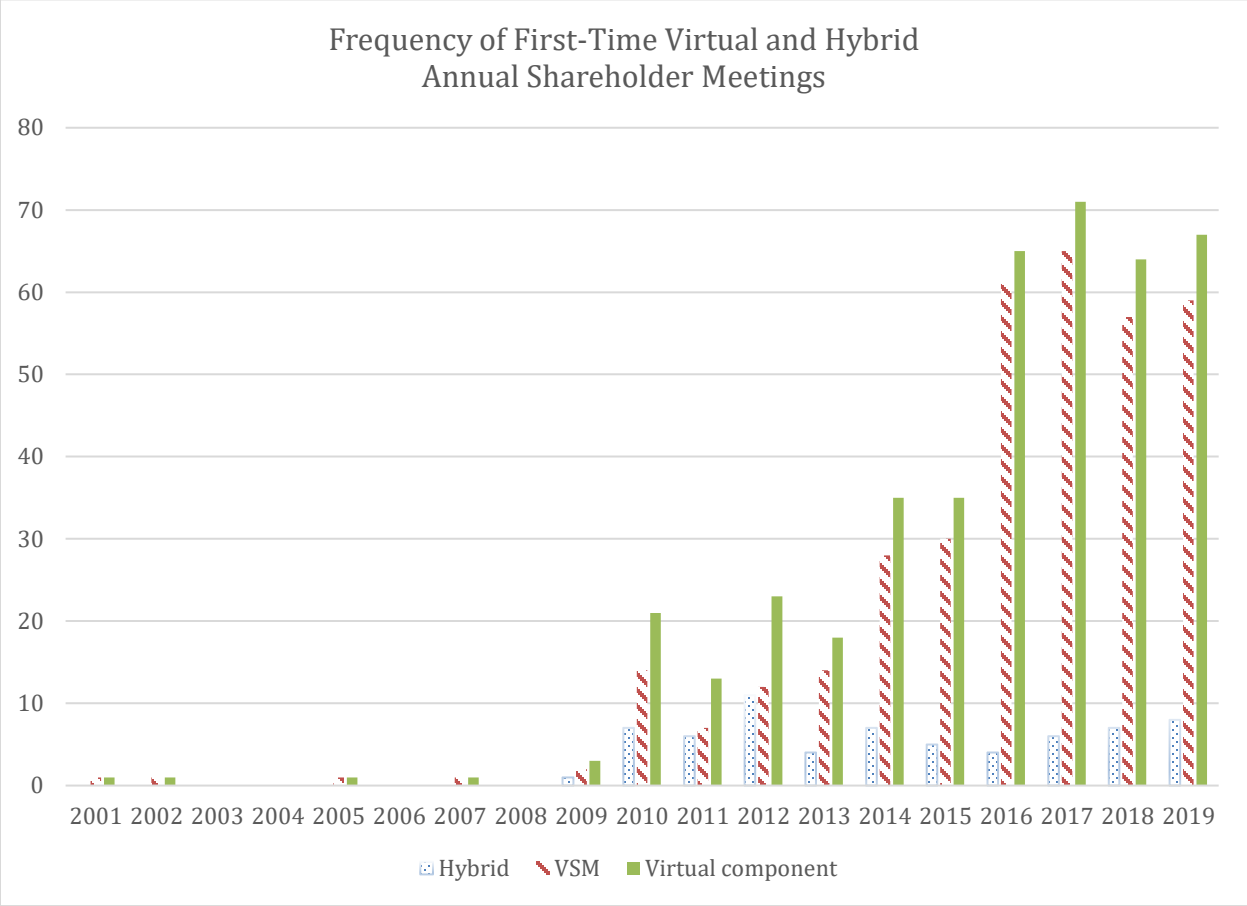

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Table 1: Voluntary adoption of virtual and hybrid annual shareholder meetings pre-Covid: patterns of adoption and disclosures

This table reports descriptive statistics on firms voluntarily adopting a virtual format at their annual shareholder meetings prior to Covid and their rationale. Panel A reports patterns of adoption. Permanent Adopters are firms that, after adoption, consistently hold their annual shareholder meetings with a virtual component (fully virtual or hybrid). Temporary Users are firms that adopt a virtual format for one or more of their annual shareholder meetings but subsequently revert back to in-person meetings. Switchers are firms that adopt a virtual format, then switch back to in-person, and then back again to some virtual format. Panels B reports the number of first-time adopters of a virtual format that disclose a rationale (column 2) and the type of rationale: cost savings (column 3), greater shareholder participation (column 4), or both (column 5). In Panel B the sample is broken down between virtual shareholder meetings (VSM) and hybrid shareholder meetings. The sample includes U.S. publicly traded firms which we identify as holding at least one VSM or hybrid meeting between 2001 and February 2020 through a keyword search in proxy filings.

Panel A: Patterns of Adoption of Virtual Format

# Permanent Adopters	346
VSM	*286*
Hybrid	*27*
Started with VSM, then Hybrid	*10*
Started with Hybrid, then VSM	*19*
Multiple Changes	*4*
# Temporary Users	53
From VSM to In-person	*42*
From Hybrid to In-person	*11*
# Switchers:	16
VSM → In-person → VSM	*9*
Hybrid → In-person → Hybrid	*0*
VSM → In-person → Hybrid	*1*
Hybrid → In-person → VSM	*2*
Other combinations	*4*
# One-Time Special Meeting	11
VSM	*10*
Hybrid	*1*
Total number of unique firms adopting a virtual format	426

Panel B: Disclosure of rationale for adopting a virtual format

	Total	Rationale Disclosed	Cost savings	Greater shareholder participation	Cost savings and greater shareholder participation
VSM	*360*	*138*	*3*	*36*	*99*
Hybrid	*66*	*5*	*0*	*5*	*0*
All	426	143	3	41	99
	100.0%	*33.6%*	*0.7%*	*9.6%*	*23.2%*

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Table 2: Sample selection and summary statistics

This table reports descriptive statistics for our sample. Panel A reports the number of observations in the sample at different steps of the selection process, from the identification of 1,432 annual shareholder meetings with a virtual component (VSM or hybrid) via a keyword search of proxy filings to the attrition due to data availability requirements in standard databases. The panel reports numbers of firms and firm-years for VSM + Hybrid (columns 1 and 2) and in-person meetings (columns 3 and 4). Panel B reports summary statistics for in-person meetings (column 1), VSM + Hybrid (column 2), VSM (column 3), and hybrid meetings (column 4). Reported variables are winsorized at one percent each tail after the second step from Panel A. Detailed variable definitions are in Appendix 2. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 two-tailed level, respectively.

Panel A: Sample Selection

	VSM + Hybrid		In-Person Meeting	
	Firm-year	Firm	Firm-year	Firm
Number of VSM and hybrid meetings (incl. special meetings)	1,432	426	-	-
Matched with Compustat and CRSP, with total assets and shareholders' equity, stock returns, state of incorporation* and SIC code available, and revenue greater than $5 million	1,203	358	39,163	5,890
Matched with Voting Analytics and BoardEx, with relevant variables available	1,106	316	27,547	4,464
Incorporated in states that allow VSM or hybrid meetings	1,090	314	25,333	4,304

* We obtain historical information on state of incorporation from firms' 10-K filings when available. Otherwise, we use the latest from Compustat.

Panel B: Summary statistics

	Control	VSM + Hybrid	VSM	Hybrid
N	25,333	1,090	911	179
MEAN				
Total Assets	7,269	10,748	8,547	21,950
Market Cap	5,268	7,780	6,311	15,256
MTB	2.87	3.75	3.74	3.76
ROA	3.73%	3.31%	3.02%	4.75%
Stock Returns	1.95%	0.99%	1.46%	-1.41%

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Table 3: Choice to hold a virtual shareholder meeting (VSM): determinants and market reaction

In Panels A and B, for each of the 911 VSM (from Table 2 Panel B) we identify the closest firm-year observation in terms of market capitalization with an-in-person meeting in the same calendar year, resulting in a size-matched sample of 911 in-person meetings. Panel A reports number of observations and mean values for VSM and in-person meetings (columns 1 to 4), as well as differences in means along with their statistical significance (columns 5 and 6). The N is different between VSM and in-person meetings when the relevant variable is available for only some of the firms. Panel B reports coefficient estimates from a logistic regression of an indicator for VSM on firm and meeting characteristics, plus year fixed effects. Standard errors are clustered by firm and fiscal year. Detailed variable definitions are in Appendix 2. The sample includes publicly listed U.S. firms with fiscal year ends between 2009 and 2019. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 two-tailed level, respectively.

Panel A: VSM vs. size-matched in-person meetings: descriptive statistics

	VSM		In-Person				
Variable	N	Mean	N	Mean	Difference in means		*t-stat*
ROA	911	3.02%	911	4.23%	-1.21%	*	-1.669
SG&A	761	39.33%	796	32.75%	6.58%	***	3.314
#Institutions	839	250.5	888	256	-5.6		-0.441
Engagement	911	0.23	911	0.02	0.21	***	4.501
Stock Returns	911	1.46%	911	2.54%	-1.08%		-0.557
Media Sentiment	869	31.69	904	31.59	0.1		0.147
Litigation	911	0.06	911	0.04	0.02	**	2.381
ContentiousPast	856	0.43	891	0.4	0.03		1.436
Contentious	911	0.47	911	0.47	0		-0.141
# Shareholder Proposals	911	0.13	911	0.16	-0.02		-0.87
BdIndep	911	84.77%	911	84.29%	0.48%		1.271
%InstOwn	837	71.33%	888	70.61%	0.72%		0.565
Total Assets	911	8,547	911	8,064	482		0.439
Market Cap	911	6,311	911	6,324	-13		-0.019
MTB	911	3.74	911	3.33	0.41		1.414
Tech	911	0.19	911	0.09	0.1	***	6.248
#SameDay	911	78	911	77.7	0.3		0.111

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Panel B: Determinants of the choice to hold a VSM: logistic regression analysis

Variable	VSM		VSM	
	Coefficient	*t-stat*	Coefficient	*t-stat*
ROA	0.145	(0.37)		
SG&A			0.139	(0.59)
#Institutions	-0.001	(-1.05)	-0.001*	(-1.77)
Engagement	0.400***	(5.10)	0.536***	(5.83)
Stock Returns	-0.071	(-0.34)	-0.064	(-0.37)
Media Sentiment	0.002	(0.58)	0.008*	(1.88)
Litigation	0.289	(1.30)	0.377	(1.31)
ContentiousPast	0.185	(1.19)	0.155	(0.99)
Contentious	-0.048	(-0.42)	-0.018	(-0.14)
# Shareholder Proposals	-0.046	(-0.36)	-0.013	(-0.09)
BdIndep	1.586*	(1.66)	2.492**	(2.03)
%InstOwn	-0.246	(-0.81)	-0.158	(-0.49)
Market Cap	0.001	(0.01)	0.046	(0.56)
MTB	-0.002	(-0.21)	-0.001	(-0.05)
Tech	0.636***	(2.72)	0.565**	(2.03)
#SameDay	0.001	(0.55)	0.001	(0.09)
Observations (VSM/Match)	1,630 (767/863)		1,402 (649/753)	
Pseudo R^2	0.036		0.057	

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Table 4: Returns around Proxy Filings announcing Virtual Shareholder Meeting (VSM) and Hybrid Shareholder Meetings

This table reports mean three-day cumulative abnormal returns (CAR) centered around proxy statements filed ahead of annual shareholder meetings with a virtual component (VSM or Hybrid). Returns are adjusted for the CRSP value-weighted market index. Panel A includes all VSM and hybrid meetings. Panel B includes only first-time VSM and hybrid meetings. In both panels, the sample is split between VSM (row 2) and hybrid (row 3) meetings. From left to right, both Panel A and Panel B report the number of observations, mean CAR and corresponding t-statistics for the full sample, and then separately for firms that do not disclose a rationale for their adoption of a virtual component, for firms that disclose a rationale, and, within the latter, by type of rationale (cost savings, greater shareholder participation, both cost savings and greater shareholder participation). The sample includes U.S. publicly traded firms which we identify as holding at least one VSM or hybrid meeting between 2001 and February 2020 through a keyword search in proxy filings and with the relevant returns data in CRSP.

Panel A: All VSM and Hybrid Meetings

	N	Mean	*t-stat*	No Rationale Disclosed	*t-stat*	Rationale Disclosed	*t-stat*	(i) Cost savings	*t-stat*	(ii) Greater shareholder participation	*t-stat*	(i) and (ii)	*t-stat*
All	1,343	-0.04%	*-0.34*	0.02%	*0.13*	-0.16%	*-0.74*	-0.61%	*-0.46*	-0.16%	*-0.45*	-0.13%	*-0.50*
VSM	1,127	-0.03%	*-0.21*	0.07%	*0.42*	-0.18%	*-0.82*	-0.61%	*-0.46*	-0.25%	*-0.59*	-0.13%	*-0.49*
Hybrid	216	-0.11%	*-0.37*	-0.17%	*-0.49*	0.26%	*0.72*	-	-	0.30%	*0.77*	-0.08%	*-0.09*

Panel B: First-time VSM and Hybrid Meetings

	N	Mean	*t-stat*	No Rationale Disclosed	*t-stat*	Rationale Disclosed	*t-stat*	(i) Cost savings	*t-stat*	(ii) Greater shareholder participation	*t-stat*	(i) and (ii)	*t-stat*
All	394	-0.07%	*-0.27*	-0.02%	*-0.06*	-0.17%	*-0.40*	-2.86%	*-2.30*	0.10%	*0.17*	-0.20%	*-0.35*
VSM	331	-0.07%	*-0.24*	0.00%	*0.01*	-0.18%	*-0.39*	-2.86%	*-2.30*	0.12%	*0.18*	-0.20%	*-0.35*
Hybrid	63	-0.10%	*-0.13*	-0.10%	*-0.12*	-0.08%	*-0.12*	-	-	-0.08%	*-0.12*	-	-

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Table 5: Effect of Voluntary Adoption of Virtual Shareholder Meetings (VSM) on Meeting's Activity: Univariate Tests

This table reports univariate tests for differences between virtual shareholder meetings (VSM) and in-person meetings in terms of meetings' activity as captured by textual analysis of the meetings' transcripts. Panel A reports results for the subset of VSM and in-person meetings from Table 2 Panel B with available transcripts from Capital IQ for fiscal years 2009 to 2019. Panel B reports the results for VSM matched (without replacement) to the in-person meetings as follows: for each VSM, we pick an in-person meeting in the same calendar year with the closest dollar value of market capitalization such that two observations do not differ in market capitalization by more than 100%. Using this approach, we find a match for 678 of the 794 VSM from Panel A. Panel C reports the results for the subset of 39 firms with transcripts for at least one in-person and one VSM during our sample period. Panels A, B, and C report mean variables for VSM (column 1) and in-person meetings (column 2), and differences between the two samples (column 3), along with their statistical significance (column 4). *Duration* is the length of the meeting in minutes. *A&P Length* is the number of words during the agenda and presentation portion of the meeting. *Business Presentation (BP)* indicates meetings with formal business presentations by management. Variables *BP Length*, *BT Tone*, and *BP Specificity* are only defined for meetings with business presentations. *BP Length* is the number of words in the business presentation section. *Q&A Length* is the number of words during the formal "Questions and Answers" portion of the meeting. *# Questions* is the number of questions asked during the meeting (if there are no questions, its value is set to zero). *Active Q&A* indicates meetings with at least one question. *# Questions (if Active Q&A=1)* is the number of questions asked during the meeting conditioned on there being at least one question. Variables *Questions' Length*, *Questions' Tone*, *Questions' Specificity*, *Answers' Length*, *Answers' Tone*, and *Answer's Specificity* are only defined for observations with at least one question. *Questions' (Answers') Length* is the average number of words per question (answer). Tone is the number of positive minus negative words scaled by total words during a given portion of the meeting (i.e., business presentation for *BP Tone*, questions for *Questions' Tone*, and answers for *Answers' Tone*). Positive and negative words are based on the Loughran and McDonald dictionary. Specificity is the number of entities (people, organizations, locations, numbers, dollar amounts, dates, etc.) mentioned in a given portion of the meeting (i.e., business presentation for *BP Specificity*, questions for *Questions' Specificity*, and answers for *Answers' Specificity*). Specificity is based on the methodology described in Hope et al. (2016). ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 two-tailed level, respectively.

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Panel A: Full sample

Variable	VSM (n=794)	In-person (n=1,887)	Difference		*t-stat*
Duration (minutes)	15.3	46.9	-31.6	***	-8.181
A&P Section					
A&P Length	1,799	4,360	-2,560	***	-32.071
Business Presentation (BP)	42.44%	85.06%	-42.61%	***	-21.992
BP Length	1,006	1,860	-853	***	-16.614
BP Tone	0.02	0.017	0.003	***	2.937
BP Specificity	69	116	-47	***	-15.115
Q&A Section					
Q&A Length	292	1,390	-1,097	***	-16.243
# Questions	0.9	2.7	-1.9	***	-12.919
Active Q&A	21.66%	49.23%	-27.57%	***	-14.81
Q&A Length (if Active Q&A=1)	1,268	2,721	-1,453	***	-9.635
# Questions (if Active Q&A=1)	4.1	5.6	-1.5	***	-4.258
Questions' Length	60	92	-31	***	-6.367
Questions' Tone	-0.034	-0.007	-0.026	***	-11.618
Questions' Specificity	15	30	-15	***	-7.188
Answers' Length	222	233	-11		-0.699
Answers' Tone	0.003	0.003	0.001		0.369
Answers' Specificity	41	43	-1		-0.37

Panel B: Size-matched sample

Variable	VSM (n=678)	In-person (n=678)	Difference		*t-stat*
Duration (minutes)	15.7	34.0	-18.4	***	-18.871
A&P Section					
A&P Length	1,835	3,832	-1,997	***	-19.245
Business Presentation (BP)	43.51%	78.91%	-35.40%	***	-14.345
BP Length	1,010	1,839	-828	***	-11.068
BP Tone	0.02	0.016	0.004	***	3.662
BP Specificity	69	111	-41	***	-9.451
Q&A Section					
Q&A Length	312	826	-514	***	-7.64
# Questions	0.9	1.8	-0.8	***	-5.236
Active Q&A	21.98%	39.82%	-17.85%	***	-7.242
Q&A Length (if Active Q&A=1)	1,332	1,975	-643	***	-3.883
# Questions (if Active Q&A=1)	4.3	4.5	-0.2		-0.455
Questions' Length	61	85	-24	***	-3.491
Questions' Tone	-0.034	-0.006	-0.027	***	-10.203
Questions' Specificity	16	18	-1		-0.912
Answers' Length	219	237	-18		-0.925
Answers' Tone	0.003	0.001	0.002		1.262
Answers' Specificity	44	32	11	**	2.432

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Panel C: Firms that eventually adopt VSM

Variable	VSM (n=139)	In-person (n=120)	Difference		*t-stat*
Duration (minutes)	21.5	43.7	-22.3	***	-7.935
A&P Section					
A&P Length	2,373	3,988	-1,614	***	-8.093
Business Presentation (BP)	68.35%	85.00%	-16.65%	***	-3.242
BP Length	1,135	2,030	-894	***	-5.816
BP Tone	0.02	0.017	0.004	**	2.232
BP Specificity	74	112	-37	***	-5.092
Q&A Section					
Q&A Length	616	2,300	-1,684	***	-5.472
# Questions	1.9	3.5	-1.6	***	-2.865
Active Q&A	33.09%	65.00%	-31.91%	***	-5.381
Q&A Length (if Active Q&A=1)	1,799	3,487	-1,687	***	-3.685
# Questions (if Active Q&A=1)	5.8	5.3	0.5		0.52
Questions' Length	65	106	-41	***	-3.333
Questions' Tone	-0.035	-0.006	-0.028	***	-6.814
Questions' Specificity	23	39	-16	**	-2.093
Answers' Length	210	212	-2		-0.077
Answers' Tone	0.005	0.005	0		-0.028
Answers' Specificity	53	35	17	*	1.823

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Table 6: Effect of Voluntary Adoption of Virtual Shareholder Meetings (VSM) on Meeting's Activity: Multivariate Tests

This table reports multivariate analyses of the association between the use of VSM and various measures of the meeting's activity, as captured by textual analysis of the meetings' transcripts. The sample includes all VSM and in-person annual shareholder meetings with transcripts available on Capital IQ and data for the control variables for fiscal years 2009 to 2019. In Panel A, the dependent variables are the natural logarithm of one plus the meeting duration in minutes (*Duration)*, an indicator for meetings with formal business presentations by management (*Business Presentation*), the natural logarithm of one plus the total number of words spoken during the business presentation portion of the meeting (*Business Presentation Length)*, the number of positive minus negative words scaled by total words during the business presentation (*Business Presentation Tone*) and the number of entities (people, organizations, locations, numbers, dollar amounts, dates, etc.) mentioned in the business presentation (*Business Presentation Specificity*). *Business Presentation Length*, *Tone*, and *Specificity* are only defined for meetings with business presentations. In Panel B, the dependent variables are an indicator for meetings with at least one question (*Active Q&A*), the (unconditional) number of questions (*# Questions)*, the number of questions conditioned on there being at least one (*# Questions (if Active Q&A=1)*), the number of positive minus negative words scaled by total words in the questions portion of the meeting (*Questions' Tone*) and the number of entities (people, organizations, locations, numbers, dollar amounts, dates, etc.) mentioned in the questions portion of the meeting (*Questions' Specificity*). *# Questions (if Active Q&A=1*), *Questions' Tone*, and *Questions' Specificity* are only defined for meetings with an Active Q&A (i.e., at least one question). *VSM* is equal to one for virtual shareholder meetings. See Appendix 2 for more details on the dependent variables and for the definitions of the independent variables. The regression specification is OLS. All regressions include industry (Fama-French 12) and year fixed effects. Standard errors are clustered by firm and fiscal year. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10, respectively.

Panel A: VSM, Meeting Duration and Business Presentation Properties

	Duration	Business Presentation	Business Presentation Length	Business Presentation Tone	Business Presentation Specificity
VSM	-0.630***	-0.317***	-0.476***	0.003***	-37.481***
	(-11.90)	(-9.24)	(-7.72)	(3.05)	(-6.92)
Market Cap	-0.005	0.004	-0.064*	0.001	-4.594
	(-0.23)	(0.26)	(-1.89)	(1.57)	(-1.35)
MTB	-0.001	-0.002	0.004	-0.001*	0.201
	(-0.18)	(-1.37)	(0.95)	(-1.68)	(0.53)
ROA	-0.001	0.195**	-0.549**	-0.003	-31.596
	(-0.00)	(2.03)	(-2.44)	(-0.98)	(-1.02)
Stock Returns	0.006	-0.007	0.088*	0.001	9.109
	(0.23)	(-0.27)	(1.74)	(1.53)	(1.31)
Media Sentiment	-0.004***	-0.001	-0.001	0.001	-0.289
	(-2.67)	(-1.02)	(-0.44)	(1.08)	(-1.13)
#Institutions	0.001***	0.001**	0.001***	0.001	0.042***
	(4.96)	(2.25)	(2.80)	(0.17)	(2.86)
Engagement	-0.017	-0.005	-0.015	-0.001	-1.291
	(-1.08)	(-0.60)	(-0.73)	(-0.66)	(-0.62)
%InstOwn	-0.529***	-0.159***	-0.076	0.004	-3.027
	(-5.06)	(-2.92)	(-0.59)	(1.63)	(-0.20)
Litigation	0.025	0.017	0.099	-0.001	1.566

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	(0.62)	(0.36)	(1.41)	(-0.58)	(0.20)
BdIndep	-0.185	0.493***	0.167	0.019***	-8.815
	(-0.67)	(2.67)	(0.31)	(2.63)	(-0.19)
Contentious	-0.042	0.008	-0.006	-0.001	-6.243**
	(-1.29)	(0.39)	(-0.23)	(-1.55)	(-2.17)
# Shareholder Proposals	0.104***	-0.008	-0.025	0.001	-4.123
	(5.75)	(-0.94)	(-1.09)	(0.04)	(-1.46)
Observations	2,528	2,528	1,855	1,855	1,855
R^2	0.436	0.239	0.104	0.046	0.102

Panel B: VSM and Q&A Session Properties

	# Questions	Active Q&A	# Questions (if Active Q&A=1)	Questions' Tone	Questions' Specificity
VSM	-0.603**	-0.148***	-0.361	-0.028***	-3.115
	(-2.56)	(-4.68)	(-0.82)	(-8.89)	(-0.79)
Market Cap	0.149	0.031*	0.261	0.002**	2.609
	(1.25)	(1.95)	(1.03)	(2.26)	(1.26)
MTB	0.005	-0.002	0.025	-0.001**	-0.264
	(0.22)	(-1.11)	(0.59)	(-2.15)	(-0.88)
ROA	-1.909*	-0.082	-2.960	0.001	-14.400
	(-1.80)	(-0.75)	(-1.53)	(0.05)	(-0.94)
Stock Returns	0.183	-0.055**	0.853***	-0.002	2.723
	(0.97)	(-2.06)	(2.87)	(-0.82)	(1.18)
Media Sentiment	-0.029***	-0.002**	-0.048***	0.001	-0.291**
	(-3.36)	(-1.97)	(-2.89)	(0.96)	(-2.17)
#Institutions	0.004***	0.001***	0.005***	-0.001*	0.037***
	(3.71)	(3.24)	(3.12)	(-1.89)	(2.94)
Engagement	-0.183	0.002	-0.365	-0.001	-2.631
	(-1.08)	(0.21)	(-1.60)	(-0.03)	(-1.52)
%InstOwn	-2.737***	-0.296***	-3.834***	-0.001	-28.263***
	(-4.72)	(-4.08)	(-2.93)	(-0.27)	(-3.33)
Litigation	0.508	-0.048	1.474	-0.004	6.857
	(0.92)	(-1.48)	(1.25)	(-1.27)	(0.80)
BdIndep	-3.657*	0.103	-7.742*	-0.015	-27.996
	(-1.84)	(0.64)	(-1.70)	(-1.32)	(-0.86)
Contentious	-0.243	-0.006	-0.371	0.003*	-4.313
	(-1.02)	(-0.25)	(-0.69)	(1.65)	(-1.06)
# Shareholder Proposals	0.161	0.009	0.016	-0.001**	1.366
	(1.13)	(0.86)	(0.09)	(-2.48)	(0.89)
Observations	2,528	2,528	1,050	1,050	1,050
R^2	0.195	0.167	0.164	0.180	0.231

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Table 7: Effect of Forced Adoption of Virtual Shareholder Meetings (VSM) on Meeting's Activity: Difference-in-Differences analyses

This table reports the results of univariate and multivariate difference-in-differences analyses of the determinants of the annual shareholder meetings' activity for 2019 (the Pre period, i.e. pre-Covid) and 2020 (the Post period, i.e. post Covid) for the sample of firms with available transcript and control variable data in both periods. The Post period includes meetings taking place in 2020 on or after April 1st. The sample includes 145 *Treatment* firms which switched from an in-person meeting (in the Pre period) to a VSM (in the Post period), and 129 *Control* firms which held a VSM in both periods. Panel A reports the results of univariate difference-in-differences analysis for the same set of variables as in Table 5. Panel B reports the results of a similar analysis but for a subset of 75 treatment firms and 75 control firms matched (without replacement) as follows: for each treatment firm we pick a control firm with the closest dollar value of market capitalization in the Pre period, as long as the difference in market capitalization does not exceed 100%. Panels C and D report the results of difference-in-differences regressions with the same dependent and controls variables as in Panels A and B of Table 6. *Duration* is the length of the meeting in minutes (log transformed in the regression). *A&P Length* is the number of words during the agenda and presentation portion of the meeting. *Business Presentation (BP)* indicates meetings with formal business presentations by management. Variables *BP Length*, *BT Tone*, and *BP Specificity* are only defined for meetings with business presentations. *BP Length* is the number of words in the business presentation section (log transformed in the regression). *Q&A Length* is the number of words during the formal "Questions and Answers" portion of the meeting. *# Questions* is the number of questions asked during the meeting. *Active Q&A* indicates meetings with at least one question. *# Questions (if Active Q&A=1)* is the number of questions asked during the meeting conditioned on there being at least one question. Variables *Questions' Length*, *Questions' Tone*, *Questions' Specificity*, *Answers' Length*, *Answers' Tone*, and *Answer's Specificity* are only defined for observations with at least one question. *Questions' (Answers') Length* is the average number of words per question (answer). Tone is the number of positive minus negative words scaled by total words during a given portion of the meeting (i.e., business presentation for *BP Tone*, questions for *Questions' Tone*, and answers for *Answers' Tone*). Positive and negative words are based on the Loughran and McDonald dictionary. Specificity is the number of entities (people, organizations, locations, numbers, dollar amounts, dates, etc.) mentioned in a given portion of the meeting (i.e., business presentation for *BP Specificity*, questions for *Questions' Specificity,* and answers for *Answers' Specificity*). Specificity is based on the methodology described in Hope et al. (2016). See Appendix 2 for more details on the dependent variables and for the definitions of the independent variables. The regression specifications in Panels C and D are OLS. All regressions include industry (Fama-French 12) effects. Standard errors are clustered by firm. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10, respectively.

Panel A: Univariate difference-in-differences analysis

Variable	Treatment Post (n=145)	Treatment Pre (n=145)	Control Post (n=129)	Control Pre (n=129)	Diff-in-Diff	*t-stat*
Duration (minutes)	34.9	44.1	16.6	15.4	-10.4**	-2.261
A&P Section						
A&P Length	3,297	3,958	1,744	1,776	-629*	-1.902
Business Presentation (BP)	73.79%	84.14%	37.21%	39.53%	-8.02%	-1.05
BP Length	1,523	1,492	995	1,008	44	0.167
BP Tone	0.008	0.019	0.013	0.019	-0.004	-1.326

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BP Specificity	92	99	63	67	-3	-0.199
Q&A Section						
Q&A Length	1,409	1,998	458	344	-703*	-1.654
# Questions	4.8	3.5	1.5	1.1	0.9	1.049
Active Q&A	62.76%	57.93%	34.88%	23.26%	-6.80%	-0.84
Q&A Length (if Active Q&A=1)	2,228	3,412	1,291	1,469	-1,005	-1.084
# Questions (if Active Q&A=1)	7.7	6.1	4.4	4.9	2.1	1.238
Questions' Length	52	119	50	49	-67***	-3.122
Questions' Tone	-0.028	-0.008	-0.031	-0.037	-0.026**	-4.303
Questions' Specificity	23	41	14	16	-15	-1.278
Answers' Length	251	230	265	260	16	0.309
Answers' Tone	0	0.001	0	0.008	0.007**	2.022
Answers' Specificity	69	54	43	46	18	0.65

Panel B: Univariate difference-in-differences analysis. Size-matched sample.

Variable	Treatment Post (n=75)	Treatment Pre (n=75)	Control Post (n=75)	Control Pre (n=75)	Diff-in-Diff	*t-stat*
Duration (minutes)	30	39.5	19.3	17.7	-11.1**	-2.2
A&P Section						
A&P Length	3,102	3,988	1,906	1,917	-874*	-1.895
Business Presentation (BP)	72.00%	77.33%	42.67%	44.00%	-0.04	-0.369
BP Length	1,392	1,595	1,016	1,039	-179	-0.632
BP Tone	0.01	0.018	0.012	0.02	0	0.087
BP Specificity	89	101	66	71	-5	-0.288
Q&A Section						
Q&A Length	908	1,352	644	510	-578	-1.515
# Questions	3.1	2.5	2.2	1.8	0.2	0.235
Active Q&A	49.33%	45.33%	46.67%	32.00%	-0.1067	-0.934
Q&A Length (if Active Q&A=1)	1,814	2,958	1,355	1,588	-910	-1.268
# Questions (if Active Q&A=1)	6.2	5.5	4.7	5.7	1.7	1.122
Questions' Length	52	89	50	48	-39***	-3.038
Questions' Tone	-0.024	-0.005	-0.031	-0.04	-0.028***	-3.653
Questions' Specificity	19	28	14	18	-4	-0.553
Answers' Length	243	251	268	222	-54	-0.8
Answers' Tone	0.002	0.004	-0.001	0.007	0.006	1.274
Answers' Specificity	56	44	48	50	13	0.733

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Panel C: Meeting Duration and Business Presentation Properties. Difference-in-differences regression.

	Duration	Business Presentation	Business Presentation Length	Business Presentation Tone	Business Presentation Specificity
Treatment	0.672***	0.316***	0.450***	-0.001	40.807***
	(7.06)	(4.21)	(2.74)	(-0.26)	(3.30)
Post	0.054	-0.044	0.196	-0.007**	-0.284
	(1.57)	(-0.93)	(1.43)	(-2.44)	(-0.03)
Treatment × Post	-0.353***	-0.101	-0.353**	-0.002	-30.669***
	(-5.25)	(-1.53)	(-2.28)	(-0.76)	(-2.77)
Market Cap	0.060**	0.024	-0.021	-0.002**	0.502
	(2.34)	(1.11)	(-0.52)	(-2.29)	(0.13)
MTB	0.001	0.001	-0.001	-0.001	-0.264
	(0.51)	(1.55)	(-0.34)	(-0.67)	(-0.71)
ROA	-0.017	0.177	-0.735*	0.016*	-68.509
	(-0.04)	(0.70)	(-1.69)	(1.97)	(-1.41)
Stock Return	0.041	0.035	0.066	0.001	7.947
	(0.57)	(0.49)	(0.47)	(0.08)	(0.60)
Media Sentiment	-0.006**	-0.001	0.001	0.001***	-0.388
	(-2.30)	(-0.61)	(0.25)	(4.75)	(-1.41)
#Institutions	0.001	0.001	0.001**	-0.001	0.010
	(0.13)	(0.82)	(2.25)	(-0.91)	(1.49)
Engagement	0.012	0.008	-0.048	0.001	-5.469
	(0.39)	(0.39)	(-0.95)	(0.97)	(-1.53)
%InstOwn	-0.276	-0.096	-0.434	0.004	-16.071
	(-1.22)	(-0.61)	(-1.29)	(0.64)	(-0.43)
Litigation	-0.042	-0.112	0.507**	-0.001	37.350*
	(-0.38)	(-1.23)	(2.24)	(-0.36)	(1.89)
BdIndep	0.143	0.592	0.090	0.054***	27.388
	(0.28)	(1.43)	(0.10)	(3.28)	(0.38)
Contentious	-0.081	-0.017	-0.156	0.003	-16.001
	(-1.39)	(-0.34)	(-1.47)	(1.36)	(-1.30)
# Shareholder Proposals	0.224***	0.020	0.037	0.001*	-2.300
	(4.00)	(0.62)	(0.77)	(1.71)	(-0.51)
Observations	395	395	230	230	230
R^2	0.419	0.202	0.164	0.233	0.208

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Panel D: Q&A Properties. Difference-in-differences regression.

	# Questions	Active Q&A	# Questions (if Active Q&A=1)	Questions' Tone	Questions' Specificity
Treatment	-0.169	0.074	-0.012	0.018***	13.712**
	(-0.33)	(1.04)	(-0.01)	(2.77)	(2.47)
Post	0.177	0.081*	-0.485	-0.002	1.826
	(0.70)	(1.85)	(-0.50)	(-0.43)	(0.43)
Treatment × Post	1.019	-0.072	2.269*	-0.019***	-13.557*
	(1.64)	(-1.05)	(1.78)	(-3.16)	(-1.74)
Market Cap	0.579***	0.080***	0.468	0.002	5.043**
	(3.05)	(4.04)	(1.36)	(1.15)	(2.24)
MTB	0.001	0.001	-0.017	0.001**	-0.052
	(0.23)	(1.20)	(-0.89)	(2.23)	(-0.58)
ROA	-1.220	0.130	-2.797	-0.038**	-37.405
	(-0.76)	(0.48)	(-0.87)	(-2.60)	(-1.46)
Stock Return	-0.342	-0.119	0.645	0.005	2.245
	(-0.80)	(-1.65)	(0.72)	(1.53)	(0.46)
Media Sentiment	-0.010	-0.001	0.002	0.001	0.045
	(-0.60)	(-0.59)	(0.04)	(0.22)	(0.22)
#Institutions	0.001	0.001	0.001	-0.001	-0.002
	(0.36)	(1.22)	(0.06)	(-0.04)	(-0.69)
Engagement	0.216	-0.001	0.395	-0.001	1.074
	(1.06)	(-0.04)	(1.51)	(-0.31)	(0.40)
%InstOwn	-2.881***	-0.196	-6.742**	0.026**	-30.808*
	(-2.62)	(-1.17)	(-2.55)	(2.05)	(-1.90)
Litigation	-0.241	-0.118	0.223	0.002	25.288
	(-0.30)	(-1.40)	(0.15)	(0.32)	(1.12)
BdIndep	1.015	0.304	-3.747	-0.039	-3.850
	(0.43)	(0.78)	(-0.72)	(-1.24)	(-0.09)
Contentious	0.151	0.015	-0.035	-0.002	5.110
	(0.44)	(0.30)	(-0.05)	(-0.51)	(1.25)
# Shareholder Proposals	1.029**	0.050	0.827*	-0.002	2.234
	(2.45)	(1.53)	(1.72)	(-1.06)	(0.69)
Observations	395	395	170	170	170
R^2	0.296	0.242	0.168	0.221	0.186

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Table 8: Effect of Voluntary and Forced VSM on the Information Content of Annual Meetings

This table examines the determinants of two market-based measures of the information content of annual shareholder meetings: absolute abnormal returns (*Absolute CAR*) and trading volume scaled by shares outstanding (*Trading Volume*), both on the annual meeting date. Daily stock returns are adjusted for the CRSP value-weighted market index.

Panel A-D examine the effect of voluntary VSM. Panel A reports mean *Absolute CAR* and *Trading Volume* separately for voluntary VSM (column 1), all in-person meetings (column 2), and size-matched in-person meetings within the same calendar year (column 3), with the latter constructed as in Table 3. Differences between columns 1 and 2 (1 and 3) and t-statistics for the corresponding t-tests are reported in columns 4 and 5 (6 and 7). Panel B reports mean values of *Absolute CAR* and *Trading Volume* separately for *Treatment* firms – i.e. firms going from an in-person meeting (column Pre) to their first voluntary VSM (column Post) – and for a contemporaneous size-matched *Control* sample of in-person meetings in both years, as well as the difference-in-differences (column 5) with the corresponding t-stat (column 6). Panel C, column 1 (column 4), reports coefficient estimates for OLS regressions of *Absolute CAR* (*Trading Volume*), respectively, on an indicator for (voluntary) VSM , meeting *Duration* (logged), an indicator for whether the meeting is *Contentious*, and the *# of Shareholder Proposals* on the ballot, daily average abnormal returns over the sixty calendar days prior to the meeting (*CAR 60 Days Past*), market value of equity (*Market Cap*), market-to-book ratio (*MTB*), past annual stock returns (*Stock Returns*), industry (Fama-French 12) and year fixed effects. In column 2 and 3 (*Absolute CAR*), and columns 5 and 6 (*Trading Volume*), meeting *Duration* is replaced with various measures of meeting activity. Panel D replicates Panel C after excluding from the sample of in-person meetings those offering a live webcast.

Panel E examines the effect of forced VSM. *Absolute CAR* and *Trading Volume* are estimated for 2019 (the Pre period, i.e. pre-Covid) and 2020 (the Post period, i.e. post Covid) for a sample of *Treatment* firms (firms holding an in-person meeting in the Pre period and forced to switched to a VSM in the Post period) and a sample of *Control* firms (firms voluntarily holding a VSM in both periods). The Post period includes meeting taking place in 2020 on or after April 1st. The reports the results of a difference-in-difference regression for the subset of treatment and control firms for which transcript data is available, with the same dependent and control variables as in Panel C. The regression models in Panels E include industry (Fama-French 12) fixed effects and the standard errors are clustered by firm. Variables are defined in detail in Appendix 2. Corresponding t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 two-tailed level, respectively.

Panel A: Univariate test: Voluntary VSM vs. In-person Meetings

	VSM	In-person	Size-matched in-person	VSM vs. in-person		VSM vs. size-matched in-person	
	N=901	N=25,399	N=901	Difference	*t-stat*	Difference	*t-stat*
Absolute CAR	1.49%***	1.55%***	1.48%***	-0.06%	*-0.88*	0.01%	0.16
Trading Volume	0.07%	0.08%***	0.04%**	-0.01%	*-0.29*	0.03%	0.55

Panel B: Univariate difference-in-differences test: effect of First-time Voluntary VSM

Variable	Treatment Post (N=179)	Treatment Pre (N=179)	Control Post (N=179)	Control Pre (N=179)	Diff-in-Diff	*t-stat*
Absolute CAR	1.49%***	1.48%***	1.86%***	1.46%***	-0.40%	-1.34
Trading Volume	0.14%	0.03%	0.11%*	0.21%**	0.21%	1.21

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Panel C: Multivariate analysis: effect of Voluntary VSM on meetings' information content

	Absolute CAR	Absolute CAR	Absolute CAR	Trading Volume	Trading Volume	Trading Volume
VSM	0.0004	-0.0001	0.0001	-0.0008	-0.0012	-0.0011
	(0.43)	(-0.02)	(0.02)	(-1.19)	(-1.57)	(-1.54)
Duration	0.0008			0.0009*		
	(1.50)			(1.92)		
Business Presentation		0.0022***	0.0022***		0.0017**	0.0016*
		(2.78)	(2.78)		(2.12)	(1.91)
Business Presentation Length		-0.0001**			-0.0001*	
		(-2.33)			(-1.71)	
Business Presentation Specificity			-0.0001**			-0.0001
			(-2.22)			(-1.41)
Active Q&A		-0.0002	-0.0001		-0.0001	0.0002
		(-0.31)	(-0.05)		(-0.16)	(0.76)
# Questions		0.0001			0.0001	
		(0.68)			(0.91)	
Questions' Specificity			-0.0001			-0.0001
			(-1.47)			(-1.45)
Answers' Specificity			0.0001***			0.0001*
			(4.66)			(1.80)
CAR 60 Days Past	0.7189***	0.7299***	0.7330***	0.0185	0.0267	0.0313
	(9.10)	(9.47)	(9.59)	(0.23)	(0.33)	(0.40)
Market Cap	-0.0007**	-0.0007**	-0.0006**	-0.0004***	-0.0004***	-0.0003**
	(-2.14)	(-2.21)	(-2.07)	(-2.62)	(-3.00)	(-2.37)
MTB	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(-1.06)	(-0.96)	(-1.01)	(-0.94)	(-0.88)	(-0.92)
Stock Return	-0.0017	-0.0017	-0.0017	0.0009	0.0009	0.0009
	(-1.59)	(-1.64)	(-1.57)	(0.66)	(0.65)	(0.66)
Contentious	-0.0001	-0.0001	-0.0001	0.0008	0.0008	0.0008
	(-0.14)	(-0.17)	(-0.13)	(0.96)	(0.96)	(0.97)
# Shareholder Proposals	0.0001	0.0002	0.0002	-0.0002	-0.0001	-0.0001
	(0.18)	(0.41)	(0.54)	(-0.75)	(-0.46)	(-0.06)
Observations	2,818	2,818	2,818	2,818	2,818	2,818
R^2	0.123	0.124	0.124	0.015	0.015	0.015

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Panel D: Multivariate analysis: effect of Voluntary VSM on meetings' information content. Sample with no audiocasts and webcasts in in-person meetings.

	Absolute CAR	Absolute CAR	Absolute CAR	Trading Volume	Trading Volume	Trading Volume
VSM	0.0019**	0.0020**	0.0020**	-0.0001	-0.0001	0.0001
	(2.49)	(2.37)	(2.43)	(-0.01)	(-0.06)	(0.02)
Duration	0.0002			0.0003		
	(0.37)			(0.65)		
Business Presentation		0.0014	0.0014		0.0012	0.0009
		(1.46)	(1.45)		(1.64)	(1.09)
Business Presentation Length		-0.0001			-0.0001	
		(-1.05)			(-1.48)	
Business Presentation Specificity			-0.0001			-0.0001
			(-1.09)			(-0.56)
Active Q&A		0.0005	0.0002		0.0006	0.0006
		(0.52)	(0.29)		(1.00)	(0.94)
# Questions		-0.0001			-0.0001	
		(-0.48)			(-0.12)	
Questions' Specificity			-0.0001*			-0.0001**
			(-1.95)			(-2.48)
Answers' Specificity			0.0001***			0.0001*
			(3.17)			(1.70)
CAR 60 Days Past	0.6303***	0.6327***	0.6336***	-0.1093	-0.1088	-0.1054
	(7.31)	(7.29)	(7.32)	(-1.29)	(-1.24)	(-1.23)
Market Cap	-0.0003	-0.0004	-0.0004	-0.0003**	-0.0004***	-0.0004**
	(-1.08)	(-1.28)	(-1.29)	(-2.50)	(-2.60)	(-2.41)
MTB	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(-1.02)	(-0.89)	(-0.87)	(-0.83)	(-0.76)	(-0.77)
Stock Return	-0.0017	-0.0017	-0.0017	0.0013	0.0013	0.0014
	(-1.31)	(-1.30)	(-1.24)	(0.77)	(0.77)	(0.78)
Contentious	-0.0007	-0.0008	-0.0007	0.0011	0.0011	0.0011
	(-0.75)	(-0.81)	(-0.77)	(1.02)	(1.00)	(1.01)
# Shareholder Proposals	0.0001	0.0001	0.0001	-0.0001	-0.0001	0.0001
	(0.06)	(0.16)	(0.37)	(-0.13)	(-0.07)	(0.32)
Observations	1,990	1,990	1,990	1,990	1,990	1,990
R^2	0.116	0.116	0.116	0.006	0.006	0.006

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Panel E: Multivariate difference-in-differences analysis: effect of Forced VSM on meetings' information content

	Absolute CAR	Absolute CAR	Absolute CAR	Trading Volume	Trading Volume	Trading Volume
Treatment	-0.0041	-0.0041	-0.0052*	-0.0018	-0.0010	-0.0006
	(-1.39)	(-1.53)	(-1.72)	(-1.40)	(-0.87)	(-0.48)
Post	0.0044	0.0047	0.0046	0.0004	0.0004	0.0005
	(1.05)	(1.16)	(1.14)	(0.17)	(0.16)	(0.21)
Treatment × Post	-0.0005	-0.0009	-0.0001	-0.0046	-0.0049	-0.0054
	(-0.11)	(-0.20)	(-0.00)	(-1.56)	(-1.65)	(-1.60)
Duration	0.0006			0.0011		
	(0.26)			(1.45)		
Business Presentation		-0.0025	-0.0063		-0.0023	-0.0031*
		(-0.79)	(-1.23)		(-1.42)	(-1.66)
Business Presentation Length		0.0001			0.0001	
		(1.29)			(1.27)	
Business Presentation Specificity			0.0001			0.0001*
			(1.43)			(1.74)
Active Q&A		-0.0068**	-0.0063**		0.0004	-0.0011
		(-2.25)	(-2.35)		(0.16)	(-0.72)
# Questions		0.0002			-0.0002	
		(0.58)			(-0.80)	
Questions' Specificity			-0.0001			-0.0001
			(-0.12)			(-1.26)
Answers' Specificity			0.0001			0.0001
			(0.30)			(1.38)
CAR Past 60 Days	0.2984**	0.3004**	0.3030**	0.0239	0.0261	0.0191
	(2.20)	(2.31)	(2.32)	(0.19)	(0.21)	(0.15)
Market Cap	-0.0012	-0.0005	-0.0004	0.0008	0.0009	0.0009
	(-1.59)	(-0.74)	(-0.54)	(1.23)	(1.51)	(1.52)
MTB	-0.0001	-0.0001	0.0001	-0.0001	-0.0001	-0.0001
	(-1.22)	(-0.25)	(0.06)	(-0.82)	(-0.72)	(-0.63)
Stock Return	-0.0065*	-0.0080**	-0.0084**	-0.0036*	-0.0037*	-0.0039**
	(-1.81)	(-2.12)	(-2.20)	(-1.82)	(-1.96)	(-2.04)
Contentious	-0.0014	-0.0013	-0.0013	-0.0032**	-0.0032**	-0.0031*
	(-0.61)	(-0.55)	(-0.53)	(-2.01)	(-1.98)	(-1.96)
# Shareholder Proposals	-0.0010	-0.0009	-0.0008	0.0001	0.0005	0.0002
	(-0.63)	(-0.66)	(-0.68)	(0.10)	(0.69)	(0.37)
Observations	374	374	374	374	374	374
R^2	0.184	0.195	0.213	0.032	0.027	0.030

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