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Does financial disclosure readability predict shareholder activism?

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Abstract

We examine the impact of financial disclosures' readability on future shareholder activism, as expressed by shareholder-initiated proxy proposals. Based on a sample of 1,560 proposals made by shareholders of 818 S&P 1500 firms between 2000 and 2014, we find that the semantic complexity of the MD&A section of the 10-K filings significantly predicts future shareholder proposals. *Ceteris paribus*, firms with more unreadable MD&A sections are more likely to face a higher incidence of shareholder proposals, up to two years in the future. We show that our results are robust to the inclusion of several alternative readability metrics; reverse causality check, and instrumental variables approach; subsample analyses, as well as a variety of confounding events.

Keywords: 10-K, corporate governance, financial disclosure, readability, semantic complexity, shareholder activism, shareholder proposals, textual analysis

JEL Classification: G14, G34, M41

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1. Introduction

Shareholder activism through the proxy process entails a least costly and most common monitoring device for corporate governance (Iliev et al., 2015; Gillan and Starks, 2000). When firms' agency concerns are exacerbated, it is optimal that shareholders seek control over corporate decisions (Harris and Raviv, 2010). As an alternative mechanism to 'exit', shareholder activism is a form of 'voice' (Hirschman, 1970) when shareholders believe managerial actions are not in line with their interest. Prior literature has identified a list of antecedents and factors that explain shareholder activism, such as operating and stock market performance, cash holding, dividend policy, institutional ownership, spillover effect from peers, board monitoring, and ESG performance (Goranova and Ryan, 2014). At the outcome level, shareholder activism is shown to increase or improve firm disclosure (Flammer et al., 2021; Michelon et al., 2020; Baloria et al., 2019; Bourveau and Schoenfeld, 2017). However, it remains unknown whether financial disclosure readability influences shareholder activism. Given the growing popularity and importance of shareholder activism (Denes et al., 2017), it is important to study this research question.

The current paper aims to extend our understanding of the role of financial disclosure readability in the context of shareholder activism. As a first step, we calculate from the text of the 10-K's MD&A section, a new proxy of financial texts' readability: the 'semantic complexity index' (SCI) (Anand et al., 2021a). A text's semantic complexity captures the difficulty in its interpretation due to usage of multi-clausal phrases (e.g., 'increased chance of default next year'), as well as that due to adjectives, adverbs and (adversative) conjunctions (e.g., 'but', 'only', 'despite', 'faintly' etc.). High (low) semantic complexity of financial texts denotes poor (good) readability.[1] Based on a sample of 1,560 proposals made by shareholders of 818 S&P 1500 firms between 2000 and 2014, we test if the readability of the MD&A section can influence future shareholder activism. We find that, after controlling for antecedents that prior literature has documented to explain shareholder activism, firms with more semantically complex financial disclosure

[1] We use the terms 'high SCI', or 'low readability' interchangeably throughout the paper.

(low readability) experience a higher likelihood of future shareholder activism—as expressed by shareholder-initiated proxy proposals. This result is further confirmed using several alternative financial text readability metrics, though their predictive power is lower as compared to SCI. We perform several additional robustness tests, including using an instrumental variables approach, excluding financial institutions, controlling for confounding events, and removing outliers of variables studied, with no corresponding change in our benchmark results.

This paper makes several contributions. First, our study contributes to the literature by showing that financial disclosures' semantic complexity has a predictive power on future shareholder activism—a previously unexplored implication of textual readability in financial disclosures. Our results are consistent with the 'incomplete revelation hypothesis' (IRH) (Bloomfield, 2008); and evidence unearthed in Li (2008); Kim et al. (2019), as well as in Anand et al. (2021a)—all of which suggest that managers produce hard-to-read financial reports to delay the release of adverse information. Second, our study contributes to the literature on the antecedents of shareholder activism (Goranova et al., 2017; Goranova and Ryan, 2014; Judge et al., 2010; Ryan and Schneider, 2002) by documenting financial disclosure readability as a plausible factor in predicting future shareholder proposals. Third, we are among the first to apply the novel measure of semantic complexity to the setting of shareholder activism. Last but not the least, the interplay between disclosures' readability and shareholder activism has novel practical implications. Our findings thus speak to regulators who seek to improve the readability of firms' financial disclosure, and practitioners who are in the position of stakeholder management to avoid triggering shareholder activism.

The remainder of this paper proceeds as follows. Section 2 reviews background and literature, and develop hypotheses. Section 3 provides a description of our sample and empirical design. Section 4 presents the baseline results. Section 5 presents robustness test results. Section 6 concludes.

2. Background and Hypotheses Development

2.1. SEC's Plain English Rule

With the objective of mitigating concerns over firms' unreadable financial disclosure filings, the SEC adopted the 1998 *Plain English Mandate*, SEC Rule 421(d), complemented with a handbook entitled "*A Plain English Handbook: How to Create Clear SEC Disclosure Documents*". The handbook encourages registrants to adopt plain English writing principles by avoiding writing constructs such as long sentences, passive voice, weak verbs, superfluous words, legal and financial jargon, numerous defined terms, abstract words, unnecessary details, and unreadable design and layout (Securities and Exchange Commission, 1998). An extensive stream of literature subsequently emerged, focusing on the impact of financial disclosures' readability on investors' behavior and welfare.[2]

2.2. Shareholder Proposals

Shareholder proposals have existed under the Securities and Exchange Commission (SEC) Rule 14a-8 in the United States since 1942.[3] During the annual shareholder meeting, shareholders can express their concern with corporate performance and governance; pressure management for corporate reform by submitting proposals for a vote; sponsor campaigns that gain support from fellow shareholders to withhold votes (in director election, for example), or make recommendations during the annual meeting. Early research questions the usefulness of shareholder proposals because of low voting support (Gillan and Starks, 2000; Gordon and Pound, 1993) and their nonbinding nature. During mid-1980s to early 1990s, shareholder proposals started to gain traction (Bauer et al., 2015; Thomas and Cotter, 2007) as a result of support from influential institutional shareholders (Denes et al., 2017); the shift to gaining majority votes, and increasing media scrutiny

[2]See Loughran and McDonald (2016) for a comprehensive review.

[3]Under SEC Rule 14a-8, shareholders continuously holding shares worth USD 2000 (or 1 percent of the market value of equity) for at least one year can submit only one proposal with a 500-word supporting statement at least 120 days before the proxy statement is mailed to shareholders. A proposal may be excluded by the SEC, upon the request of the company, if it violates certain conditions or persuades the proponent to withdraw by agreeing to it. If a proposal is neither withdrawn nor excluded by the SEC, it will be included in the proxy and will be voted upon at the annual meeting.

over the issues underlying proposals (García Osma and Grande-Herrera, 2021).

Thereafter, shareholder proposals have become one of the prevalent vehicles through which shareholders engage in activism by publicly voicing their intentions and/or dissatisfaction, in order to target the firm including its directors and management (García Osma and Grande-Herrera, 2021). Shareholder proposals entail a useful device of external control that helps counter managerial agency problems (Renneboog and Szilagyi, 2011; Bebchuk, 2005); and reduce agency costs through increasing director responsiveness to shareholder concerns (Thomas and Cotter, 2007). The market perceives proposals submitted against companies with exacerbated agency concerns as meaningful control benefits (Renneboog and Szilagyi, 2011). Shareholder proposals that win a majority votes are more likely to be implemented due to the *ex-ante* threat of reputational penalties (Ertimur et al., 2010). Shareholder proposals also increase the incidence of CEO turnover and independent board chairman appointment in target firms (Buchanan et al., 2012).

2.3. Financial Disclosure and Shareholder Activism

In corporate disclosure research, 10-K filing is a frequently visited area, as it provides managers with an avenue to disclose critical inside information and managerial perspectives (Kim et al., 2019; Campbell et al., 2014; Merkley, 2014; Kravet and Muslu, 2013; Li et al., 2013). The Management Discussion and Analysis (MD&A) section of the 10-K report is a key narrative disclosure required by the SEC, which provides investors with critical information useful in predicting future cash flows of the focal company (Brown and Tucker, 2011). Disclosure helps firms reduce the chance of being targeted by means of pre-empting activism via the following channels: It can guide the stock price to converge to its fundamental value; enhance communication between management and stakeholders; improve the credibility and reputation of the firm; and reduce litigation risk (Bourveau and Schoenfeld, 2017).

Corporate disclosure policy is jointly determined by costs and benefits (Beyer et al., 2010). Grossman and Stiglitz (1980) demonstrates an efficient market equilibrium at which return to data analysis must equal the cost of analysis. Otherwise, more or fewer investors analyze the data until an equilibrium is reached. The 'incomplete revelation

hypothesis' (IRH) (Bloomfield, 2002) proposes that information that is more costly to extract from public data are less completely revealed by market prices. A direct implication of IRH is that, managers have incentives to strategically increase processing cost of negative information by writing more complex financial reports to prevent stock prices from declining and associated outcomes such as discount in their stock option based compensation. This conjecture, also referred to as "management obfuscation hypothesis", is tested in Li (2008) and Kim et al. (2019). Li (2008) shows that managers make bad news more costly to process by writing excessively long annual reports with unnecessarily long sentences and big words. In turn, Kim et al. (2019) document that managers have both incentives and abilities to hide negative information by writing more opaque financial reports. On the other hand, managers tend to be more forthcoming in the disclosure when the firm performance is satisfactory (Schrand and Walther, 2000; Lang and Lundholm, 2000).

As discussed above, complex financial reports evoke a notion of management obfuscation of negative news in reporting entities. However, the engineered information opacity, facilitated by complex financial reports, only allows managers to delay the releases of adverse information to a certain threshold. The adverse information will be ultimately released when such threshold is surpassed (Kim et al., 2019). One could suspect that managers could simply omit negative news from the financial reports. However, given the *ex-ante* threat of reputational penalty and litigation risk, managers are less likely to be engaged in the practice of omitting key adverse information (Skinner, 1994). It is also possible that complex financial reports are produced as a result of a true depiction of firms with complex business activities and underlying economic conditions, and large and complex firms are more likely to become the target for shareholder activism (Cai and Walkling, 2011; Ertimur et al., 2011; Smith, 1996). To this end, we posit that firms with less readable financial reports are either complex entities, reporting complex managerial disclosure; or those inclined to weak performance and/or corporate governance issues prior to shareholder voting; and this could lead to subsequent shareholder-initiated proposals. Therefore, we hypothesize that:

Hypothesis 1: *Financial disclosures with poor readability can lead to future shareholder-initiated proxy proposals.*

3. Data and Methodology

3.1. Data

Data used in this study are retrieved from several databases. First, our readability proxy: the semantic complexity index (SCI), is calculated using the MD&A section of 10-K reports extracted from the Loughran and McDonald website.[4] Second, the shareholder proposals' data are retrieved from the Institutional Shareholder Services (ISS). Third, firm-level financial characteristics are extracted using CRSP and Compustat databases. Fourth, we use institutional ownership data from Factset. Fifth, board characteristics are measured based on BoardEx data. Lastly, we obtain firms' ESG ratings from the KLD database. The resulting sample spans from 2000 to 2014. Our sample period ends in 2014 because it is the last available year for the KLD ESG ratings data. The resulting sample consists of 5,136 firm-year observations. Table 1 reports the breakdown of the number of proposals by firm. The number of proposals varies from 0 to 16. Table 2 reports sample composition by year and industry.

[Tables 1 and 2 about here.]

3.2. Readability Proxy: Semantic Complexity Index (SCI)

We employ the semantic complexity index developed in Anand et al. (2021a) as a proxy for financial disclosures' readability. The semantic complexity index of a financial text captures the marginal connotation of that part of a sentence which originates from the usage of multi-clausal phrases (e.g., 'enhancement in business profitability') as well as that due to 'valence shifters': adjectives, adverbs and (adversative) conjunctions (e.g., 'slightly', 'massively', 'despite', 'but' etc.) which modify the connotation of verb/noun-forms with which they are used. All else equal, increased usage of multi-clausal phrases

[4] https://sraf.nd.edu/

and valence shifters makes ascribing meaning to sentences more difficult, and therefore, makes the text harder to read. Thus, (all else equal) higher semantic complexity in texts leads to poorer readability, and lower semantic complexity leads to enhanced readability.

We calculate the semantic complexity index as the absolute value of the difference between the connotation of the financial text calculated according to ngram, valence shifter approach in Anand et al. (2021b) and the unigram LM dictionary and bag-of-words approach (Loughran and McDonald, 2011). Clearly, the difference in connotation between the two approaches is precisely the marginal contribution of multiclausal phrases and valence shifters in ascribing connotation to the whole text. In other words, SCI of a text is precisely its marginal connotation, as calculated with and without multi-clausal phrases and valence shifters.

For example, the sentence below is taken from the MD&A section of the 10-K of AAC Holdings Inc. on March 11, 2015.

> "*The gross profit margin percentage declined slightly from the prior year primarily due to start up activities at the Indianapolis air frame maintenance facility.*"

The connotation of this sentence using the unigram bag-of-words approach and LM dictionary is:

$$\frac{(-1)[=\text{declined}]}{14} = -0.0714$$

However, the sentence has one valence shifter: "slightly" which is a de-amplifier. Thus, the value of the texts' tone using the sentence as a unit and valence shifters is:

$$\frac{(-1)[=\text{declined}] + (0.8)[=\text{slightly}]}{16} = -0.0125$$

Hence, the new readability score, SCI, for this sentence is:

$$\text{SCI} = |-0.0714 - (-0.0125)| = 0.084$$

3.3. Model

In order to test the impact of financial disclosures' readability on future shareholder-initiated proxy proposals, we estimate Model 1 using the binomial logit regression.

$$SP_{i,t} = \beta_0 + \beta_1 SCI_{i,t-n} + \sum_{j=2}^{12} \beta_j Control_{i,t-1} + u_{i,t} \quad (1)$$

where i indexes firms, and t indexes years. SP refers to shareholder proposals, which is a binary variable that takes a value of 1 if a shareholder proposal is filed, and 0 otherwise; SCI is the readability proxy as defined in Section 3.2 with n taking a value of either 1 or 2; and β_1 is the coefficient of interest. In choosing firm-level covariates for the logit model, we are motivated by prior literature on the antecedents of shareholder activism. Specifically, the natural logarithm of market value of equity is used as a measure of firm size. Large firms are more likely to become the target (Cai and Walkling, 2011; Ertimur et al., 2011; Smith, 1996), as these firms have greater visibility (Rehbein et al., 2004) and shareholder activists could generate more value by targeting large companies (Del Guercio and Hawkins, 1999; Strickland et al., 1996). We include return on assets (ROA) and book-to-market ratio to control for firms' operating performance and stock market performance, respectively. Firms with poor operating performance and suboptimal stock market performance are more likely to become the target of shareholder activism (Ertimur et al., 2011; Renneboog and Szilagyi, 2011; Karpoff et al., 1996). We control for firm cash holding as activists target cash-rich companies to extract excess cash from them (Klein and Zur, 2009). Financial leverage is measured as the percentage of total liabilities of total assets. Hedge fund activism also tends to target firms with a lower leverage (Klein and Zur, 2009) while the reverse holds for governance-related activism (Ferri and Sandino, 2009; Karpoff et al., 1996). We also include a dividend payout dummy that takes a value of one if the firm paid dividend in a given fiscal year, and zero otherwise. Brav et al. (2008) find that target firms' dividend payout is significantly lower than their peers. We control for firm tangibility as a proxy for liquidation costs (Smith, 2008), and pre 10-K filing idiosyncratic volatility computed using the root mean square error (RMSE) from the market model of return from 6 to 257 days prior the 10-K date (Loughran and McDonald, 2014).

ESG performance is another driver for shareholder activism. Rehbein et al. (2004) show that the larger companies who engage in poor ESG practices are frequently targeted by activists. We control for ESG performance using the KLD ESG ratings across six dimensions.[5] We further control for monitoring variables, both internal and external to the firm. For internal monitoring, we include two board characteristics' variables: Board size and board independence, measured as number of directors and the ratio of non-executive directors on board, respectively. Firms with more independent boards tend to attract shareholder activism (Ertimur et al., 2011). We include institutional ownership to account for external monitoring. Prior literature documents a positive association between institutional ownership and shareholder activism (Cai and Walkling, 2011; Renneboog and Szilagyi, 2011; Smith, 1996). Cziraki et al. (2010) find that proposal probability increases in the target company's ownership concentration, and the equity stake of institutional investors. We include industry dummies, created using Fama–French 12 industry classification, to account for omitted effects at the industry level. Year dummies are includes to control for year-specific effects. Table 3 reports summary statistics for all variables studied. Detailed variable definition is reported in Appendix A.

[Table 3 about here.]

4. Results

4.1. Comovement of SCI and Shareholder Proposals

Figure 1 provides some context for our empirical analysis. It presents the evolution of the number of shareholder proposals over years from 2000 to 2014, and its comovement with the MD&A semantic complexity. Overall, the number of shareholder proposals seems positively correlated with SCI over time.

[Figure 1 about here.]

[5] These are: community relations, diversity, employee relations, environment, human rights, and product safety.

4.2. Baseline Results

First, we examine the impact of SCI on the probability of future shareholder proposals. Table 4 reports test results of estimating Model 1. Column (1) presents results in the absence of SCI. Columns (2) to (4) report results with SCI included in the model estimation, and suggest that SCI is significantly and positively associated with shareholder proposal probability. An increase in the MD&A section's semantic complexity is associated with higher probability of shareholder proposals up to two years after the initial filing of the 10-K. This result is further confirmed by results in columns (5) and (6), which are based on a mean SCI calculated in a window spanning from year 1 to year 2 ([t+1, t+2]), and year 2 to year 3 ([t+2, t+3]), respectively. Both the size of the coefficients, and the level of statistical significance improve under these two specifications. The McFadden pseudo R^2 falls in the range of 0.2 and 0.4 for all specification.[6] Goodness of Fit tests were performed on all models with ROC curves, indicating good fits; and none of the F-statistics indicate any concerns about it. Therefore, we find evidence in support of the hypothesis H1.

Next, we gauge the predicted value of SCI on shareholder proposals. Table 5 reports the predicted probabilities[7] for the shareholder proposals from results reported in Table 4. Probabilities are predicted with varying values for SCI, and all other variables set at their mean values. As expected from a logit model estimation, the predicted probabilities increase non-monotonously with increases being higher from the 75^{th} percentile to the 90^{th} percentile compared to the ones from the 10^{th} percentile to the 75^{th} percentile. Moreover, the predicted probabilities decrease across all percentile values of SCI from year 1 to year 3, indicating a diminishing effect of SCI in predicting future shareholder proposals over time.

[Tables 4 and 5 about here.]

[6] Values of 0.2 to 0.4 for pseudo R^2 represent excellent model fit (McFadden, 1979).

[7] The logit coefficient can be transformed into probability by taking the exponential of the coefficient and then dividing the exponential value by the sum of one and the exponential value.

5. Robustness

5.1. Alternative Readability Measures

In this section, we check the robustness of our results to the choice of readability measure. We employ the set of readability measures developed and compared in Loughran and McDonald (2014), and test their impact on future shareholder proposals. Table 6 presents the summary statistics for these alternative readability measures while Table 7 reports correlation between *SCI* and alternative readability measures. *SCI* is positively correlated with the formula-based readability measure, *Fog Index*, and is negatively correlated with the quantity-based readability measures: *Vocabulary*, *Log Words*, and *Log File Size*.

[Tables 6 and 7 about here.]

We first examine the impact of the most used readability measure, Fog Index, on shareholder proposal probability. Results, reported in Table 8, are similar to our baseline results, but the size of coefficients are relatively smaller. We also compute the predicted probability based on the Fog Index results, reported in Table 9. Overall, the predicted probabilities are lower compared to those using SCI in Table 5. This confirms our claim that our readability proxy, *SCI*, has higher predictive power for shareholder proposals than the Fog Index.

[Tables 8 and 9 about here.]

We next substitute *SCI* in our model with the following quantity-based readability measures developed in Loughran and McDonald (2014): *Vocabulary*, *Log Words*, and *Log File Size*. Results in Table 10 suggest that none of these measures can predict future shareholder proposals except for *Log File Size*. This is probably due to the shortcomings of quantity-based disclosure such as *Log Words*, which is the outcome of trading off between writing closely and succinctly given that "*writing a disclosure in plain English can sometimes increase the length of particular sections*" (Securities and Exchange Commission, 1998). Similar claims are also made in Bloomfield (2008), which discusses

a classification of length-based measures based on their ontological versus obfuscation utilities; and specifies how the complexity of a business might require it to have lengthier disclosure (ontological argument); and this need not necessarily be done for the purpose of obfuscating information. Bonsall IV et al. (2017) note that quantity-based measures are necessarily limited metrics of plain English readability because they only capture a single plain attribute: superfluous words. Therefore, *SCI* compares favorably to quantity-based readability measures as it is not based on counting complex words or length, thus not suffering form the above shortcomings.

[Table 10 about here.]

5.2. Reverse Causality Check

As discussed in Section 2.2, prior literature has documented that shareholder-initiated proxy proposals can influence the target firm's disclosure (Flammer et al., 2021; Baloria et al., 2019; Ferri and Sandino, 2009). Therefore, it is plausible that our model estimation suffers from reverse causality problem. It could be the case that the disclosure choices made for current 10-K filings are influenced by both contemporaneous and past shareholder proposals. To run the diagnosis of reverse causality, we regress *SP* on *SCI* along with the set of control variables specified in Section 3.3. Table 11 reports results for the reverse causality check, which suggest that shareholder proposals do not have a statistically significant impact on SCI when individual year is considered (Columns 1–3). However, when mean SCI is used as the dependent variable, shareholder proposals have a positive effect on disclosure readability. This could be due to the fact that disclosure related issues raised in proxy proposals are longstanding and require more than one year to address. This finding motivates us to choose the use of an instrumental variables approach in Section 5.3 to address this issue.

[Table 11 about here.]

5.3. Instrumental Variables Approach

We next turn to an instrumental variable (IV) approach with a view to accounting for possible endogeneity. The IV approach requires the instrument to be correlated with the independent variable (*SCI*) and not be a direct cause of the dependent variable *SP*. We use *Log Words* as an instrument to isolate the exogenous component of SCI. As shown in Table 7, *Log Words* is negatively correlated with *SCI* at the 1% significance level. This suggests that *Log Words* satisfies the relevance criterion of instrumental variables. However, as reported in Panel B of Table 10, *Log Words* does not have a direct impact on proposal probability, thus satisfying the exclusion condition of instrumental variables. We perform two stage least squares (2SLS) estimation using a control function approach in the second stage. The control function approach is proven to be superior to standard 2SLS in application to binary outcome models (Wooldridge, 2014; Terza et al., 2008). Results for this test are reported in Table 12. The first stage estimation uses contemporaneous, as well as lagged IV, both of which produce consistent results. The F-statistic from the first-stage regression exceeds the critical value of 10, confirming the instrument is not weak. These findings support a causal interpretation of the effect of financial disclosure readability on future shareholder proposals.

[Table 12 about here.]

5.4. Excluding Financial Institutions

We exclude financial firms (SIC 6011–6799) from our sample and repeat the analysis. We do this primarily because information acquisition for shareholders of financial institutions can be considerably costly, thus discouraging active monitoring. Financial institutions, in particular banks, are inherently more opaque than nonfinancial firms (Flannery et al., 2013, 2004; Morgan, 2002). Such lack of transparency is derived from banks' balance sheets, which reflect investment decisions, based on private information about projects and borrowers unavailable to outsiders (Bushman, 2014); and risk embedded in complex trading portfolios that are difficult to verify and assess, with trading

positions related risk changes in real time (Laeven, 2013). Table 13 reports results under this specification. Our main inferences remain substantively unchanged.

[Table 13 about here.]

5.5. *Proposal Outcome*

We also check whether the impact of SCI on proposal probability differs depending upon the proposal outcome (i.e., whether a proposal has passed or failed). Panel A of Table 14 reports results for shareholder proposals that have passed while Panel B presents results for proposals that have failed. Results are comparable across passed and failed proposals, with mean SCI having a positive impact on passed proposals (Columns 4 and 5, Panel A) and SCI have a positive effect on failed proposals at year 2 (Column 2, Panel B).

[Table 14 about here.]

5.6. *Confounding Events*

In this section, we check the robustness of our results to additional confounding events that may affect shareholder proposal probability. The first type of confounding events are shareholder activism at industry peers. Activist campaigns with large firms often capture extensive public and media attention, which drives firms to preemptively respond to reforms demanded by activists at their peer firms (Ferri and Sandino, 2009; Brandes et al., 2008). Thus, we account for the spillover effect of industry peers by controlling for the number of shareholder proposals for each industry each year, prior to the proxy proposal data of the focal company in our regression. Panel A of Table 15 reports results under this specification. Results remain similar to those reported in Table 4.

Another type of confounding events are earnings announcements. The existing literature documents that managers respond to the shareholder pressure by managing the timing and content of earnings announcements prior to annual shareholder meetings (Dimitrov and Jain, 2011). Earnings announcements thus represent confounding events

when they take place in a sequence with 10-K filing. Therefore, we check whether changes in EPS channels the impact of SCI on shareholder proposals' probability. We include an *EPS Dummy*, which take a value of one if a firm's EPS is above the sample median for the industry-year pair, in our regression. Panel B of Table 15 reports this results. Column (1) reports the standalone effect of *EPS Dummy* on proposal probability while Columns (2) to (6) report results when the interaction term, $SCI \times EPS\ Dummy$, is included. It is found that the *SCI* remains positive and statistically significant for years 2 and 3 while the interaction term is not statistically significant across all specifications. Our results are thus not altered in the presence of earnings events and our main inference remains valid.

[Table 15 about here.]

5.7. Other Robustness Tests

We address potential problems caused by outliers by winsorizing all continuous independent variables at the 1^{st} and 99^{th} percentiles of their empirical distribution. Results, unreported for brevity, remain qualitatively the same.

6. Conclusions

Applying a new readability proxy which captures financial texts' semantic complexity, we find that firms with more semantically complex financial disclosures, experience increased future shareholder activism. This result is further confirmed using several alternative financial text readability measures. SCI shows higher predictive power over future shareholder activism than several existing widely used readability metrics. Results are robust to additional tests including using an instrumental variables approach, excluding financial institutions, controlling for confounding events, and removing outliers of variables studied.

Our paper contributes to the literature by examining the effect of financial disclosure readability on future shareholder activism—a previously unexplored implication of textual readability in financial disclosure. Our results are consistent with the 'incomplete

revelation hypothesis' (IRH) (Bloomfield, 2008); and evidence unearthed in Kim et al. (2019) and Li (2008) in suggesting that managers produce hard-to-read, semantically complex financial reports to delay the release of advere information. We also contribute to the literature on the antecedents of shareholder activism by showing financial disclosure readability is a significant factor explaining future shareholder activism. Given that disclosure entails a useful tool for stakeholders' communication and engagement, our findings have practical implications for regulators in improving financial reporting transparency.

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Figure 1: Comovement of SCI and Shareholder Proposals

This figure shows the comovement of median SCI and total number of shareholder proposals from 2000 to 2014.

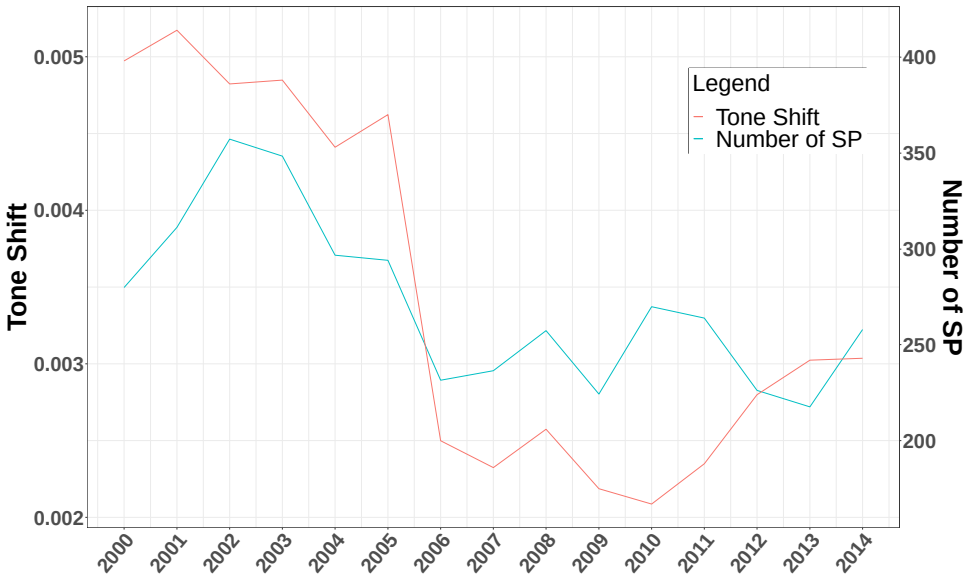

Table 1: Number of Proposals Per Firm

This table reports the number of shareholder proposals per firm over the period 2000–2014 for S&P 1500 firms.

Number of proposals per firm	Number of observations
0	3,576
1	855
2	372
3	161
4	64
5	40
6	27
7	9
8	9
9	10
10	8
12	3
15	1
16	1
Total	5,136

Table 2: Sample Composition

This table reports sample composition. Panel A reports sample composition by year. Panel B reports sample composition by Fama-French 12 industry classification.

Panel A. Sample Composition by Year

Year	Frequency	Percent	Cumulative
2000	50	0.97	0.97
2001	147	2.86	3.84
2002	200	3.89	7.73
2003	424	8.26	15.99
2004	452	8.8	24.79
2005	433	8.43	33.22
2006	409	7.96	41.18
2007	371	7.22	48.4
2008	388	7.55	55.96
2009	438	8.53	64.49
2010	435	8.47	72.96
2011	464	9.03	81.99
2012	434	8.45	90.44
2013	467	9.09	99.53
2014	24	0.47	100
Total	5,136	100	

Panel B. Sample Composition by Industry

Industry	Frequency	Percent	Cumulative
Nondurarbles	540	10.51	10.51
Manufacturing	1,534	29.87	40.38
Energy	227	4.42	44.8
Chemicals	140	2.73	47.53
Business Equipment	250	4.87	52.39
Telecom	41	0.8	53.19
Utilities	348	6.78	59.97
Shops	396	7.71	67.68
Healthcare	484	9.42	77.1
Money Finance	761	14.82	91.92
Other	415	8.08	100
Total	5,136	100	

Table 3: Summary Statistics

This table presents descriptive statistics of the variables studied in this paper. N refers to the number of observations. SD is the standard deviation. Min and Max refer to the minimum and maximum values, respectively. All variables are as defined in Appendix A.

	N	Mean	Median	SD	Min	Max
SCI	5,136	0.500	0.370	0.479	0.000	8.769
Size	5,136	7.754	7.619	1.366	3.985	12.146
Book-to-Market	5,136	−0.806	−0.756	0.757	−3.565	1.460
Leverage	5,136	0.540	0.540	0.231	0.024	1.075
ROA	5,136	0.045	0.044	0.104	−2.075	0.609
Cash Holding	5,136	0.174	0.106	0.181	0.000	0.985
Dividend Dummy	5,136	0.534	1.000	0.499	0.000	1.000
Tangibility	5,136	0.225	0.137	0.227	0.000	0.951
Pre-filing RMSE	5,136	2.012	1.790	1.066	0.547	21.139
ESG	5,136	−0.282	0.000	2.51	−10.000	18.000
Board Size	5,136	9.392	9.000	2.589	4.000	33.000
Board Independence	5,136	83.204	87.500	9.371	33.333	110.000
Institutional Ownership	5,136	0.791	0.830	0.190	0.064	1.000

Table 4: Impact of SCI on Shareholder Proposals

This table reports regression results related to the impact of SCI on shareholder proposals. All regressions include industry or year fixed effects (not reported). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors are reported in parentheses. All variables are as defined in Appendix A.

	(1) t+1	(2) t+1	(3) t+2	(4) t+3	(5) [t+1, t+2]	(6) [t+2, t+3]
SCI		0.070	0.181**	0.083	0.332**	0.347**
		(0.077)	(0.089)	(0.093)	(0.153)	(0.156)
Size	0.942***	0.944***	1.003***	1.037***	0.972***	0.989***
	(0.039)	(0.039)	(0.043)	(0.047)	(0.041)	(0.042)
Book-to-Market	0.412***	0.412***	0.400***	0.482***	0.401***	0.436***
	(0.066)	(0.066)	(0.073)	(0.079)	(0.068)	(0.072)
Leverage	0.833***	0.848***	0.906***	0.839***	0.834***	0.818***
	(0.219)	(0.219)	(0.241)	(0.265)	(0.228)	(0.241)
ROA	1.182***	1.204***	1.297***	1.196**	1.208***	1.229**
	(0.450)	(0.453)	(0.484)	(0.563)	(0.468)	(0.544)
Cash Holding	−0.004	−0.008	−0.157	−0.133	−0.079	−0.208
	(0.298)	(0.298)	(0.330)	(0.363)	(0.311)	(0.331)
Dividend Dummy	0.365***	0.362***	0.312***	0.248**	0.343***	0.307***
	(0.090)	(0.090)	(0.100)	(0.106)	(0.094)	(0.097)
Tangibility	0.164	0.164	0.194	0.287	0.225	0.334
	(0.231)	(0.231)	(0.250)	(0.266)	(0.240)	(0.249)
Pre-filing RMSE	0.159***	0.158***	0.281***	0.264***	0.156***	0.163***
	(0.048)	(0.048)	(0.063)	(0.066)	(0.052)	(0.054)
ESG	−0.002	−0.001	−0.0004	−0.005	−0.005	−0.001
	(0.015)	(0.015)	(0.017)	(0.018)	(0.016)	(0.016)
Board Size	0.004	0.004	0.012	0.028	0.006	0.002
	(0.018)	(0.018)	(0.019)	(0.021)	(0.018)	(0.019)
Board Independence	−0.002	−0.002	−0.003	−0.003	−0.003	−0.001
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Institutional Ownership	1.356***	1.351***	1.175***	1.268***	1.246***	1.227***
	(0.246)	(0.246)	(0.275)	(0.310)	(0.259)	(0.280)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.24	0.24	0.25	0.25	0.25	0.25
ROC Curve	0.82	0.82	0.82	0.83	0.82	0.82
Observations	5,136	5,136	4,395	3,938	4,863	4,570

Table 5: Impact of SCI on Shareholder Proposals: Predicted Probability

This table presents the predicted probabilities for the shareholder proposals from results in Table 4. Probabilities are predicted with values of *SCI* varied and all other variables set at their mean values.

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
SCI (10^{th} Percentile)	23.23%	21.89%	21.43%	21.24%	20.04%
SCI (25^{th} Percentile)	23.49%	22.36%	21.57%	21.40%	20.14%
SCI (50^{th} Percentile)	23.99%	23.29%	22.04%	22.19%	20.74%
SCI (75^{th} Percentile)	24.79%	24.76%	23.23%	23.68%	22.31%
SCI (99^{th} Percentile)	29.48%	33.93%	30.50%	29.96%	29.01%

Table 6: Summary Statistics of Loughran and McDonald (2014) Readability Measures

This table reports summary statistics of readability measures developed in Loughran and McDonald (2014).N refers to the number of observations. SD is the standard deviation. Min and Max refer to the minimum and maximum values, respectively. All variables are as defined in Appendix A.

	N	Mean	Median	SD	Min	Max
Fog Index	5,090	21.547	21.497	1.661	14.54	41.610
Vocabulary	5,090	0.712	0.664	0.256	0.059	2.980
Log Words	5,090	9.357	9.358	0.561	5.598	11.581
Log File Size	5,090	15.075	14.717	1.304	11.634	18.844

Table 7: Correlation Between SCI and Other Readability Measures

This table reports correlation between SCI and existing readability measures developed in Loughran and McDonald (2014). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. All variables are as defined in Appendix A.

	SCI	Fog Index	Vocabulary	Log Words
Fog Index	0.055***	1		
Vocabulary	−0.177***	0.252***	1	
Log Words	−0.255***	0.222***	0.881***	1
Log File Size	−0.073***	0.241***	0.329***	0.278***

Table 8: Impact of Readability on Shareholder Proposals (Loughran and McDonald (2014) Fog Index)

This table reports regression results related to the impact of disclosure readability on shareholder proposals using *Fog Index* from Loughran and McDonald (2014). All regressions include industry or year fixed effects (not reported). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors are reported in parentheses. All variables are as defined in Appendix A.

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
Fog Index	0.057**	0.042	0.045	0.016**	0.013*
	(0.025)	(0.027)	(0.029)	(0.007)	(0.007)
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.24	0.25	0.25	0.25	0.25
ROC Curve	0.82	0.82	0.83	0.82	0.83
Observations	5,081	4,338	3,885	4,790	4,495

Table 9: Impact of Fog Index on Shareholder Proposals: Predicted Probability

This table presents the predicted probabilities for the shareholder proposals from results in Table 8. Probabilities are predicted with values of *Fog Index* varied and all other variables set at their mean values.

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
Fog Index (10^{th} Percentile)	25.18%	25.26%	22.90%	24.03%	22.46%
Fog Index (25^{th} Percentile)	24.54%	24.23%	22.61%	23.96%	22.43%
Fog Index (50^{th} Percentile)	23.92%	23.26%	21.88%	23.58%	22.30%
Fog Index (75^{th} Percentile)	23.29%	22.28%	20.59%	23.30%	22.16%
Fog Index (99^{th} Percentile)	21.43%	19.46%	16.97%	23.01%	22.02%

Table 10: Impact of Readability on Shareholder Proposals (Loughran and McDonald (2014) Additional Readability Measures)

This table reports regression results related to the impact of disclosure readability on shareholder proposals using alternative readability measures from Loughran and McDonald (2014). Panel A reports results using *Vocabulary*. Panel B presents results using *Log Words*. Panel C reports results using *Log File Size*. All regressions include industry or year fixed effects (not reported). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors are reported in parentheses. All variables are as defined in Appendix A.

Panel A. Vocabulary

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
Vocabulary	0.035	−0.218	−0.067	0.262	0.269
	(0.190)	(0.209)	(0.220)	(0.223)	(0.228)
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.24	0.25	0.25	0.25	0.25
ROC Curve	0.82	0.82	0.83	0.82	0.83
Observations	5,081	4,338	3,885	4,790	4,495

Panel B. Log Words

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
Log Words	−0.033	−0.125	−0.066	0.023	0.019
	(0.079)	(0.087)	(0.090)	(0.017)	(0.017)
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.24	0.25	0.25	0.25	0.25
ROC Curve	0.82	0.82	0.83	0.82	0.83
Observations	5,081	4,338	3,885	4,790	4,495

Panel C. Log File Size

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
Log File Size	0.086	0.005	0.054	0.035**	0.031**
	(0.064)	(0.066)	(0.066)	(0.016)	(0.016)
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.24	0.25	0.25	0.25	0.25
ROC Curve	0.82	0.82	0.83	0.82	0.83
Observations	5,081	4,338	3,885	4,790	4,495

Table 11: Impact of Shareholder Proposals on SCI

This table reports OLS regression results related to the impact of shareholder proposals on SCI. All regressions include industry or year fixed effects (not reported). Standard errors are adjusted for clustering at the firm level. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors are reported in parentheses. All variables are as defined in Appendix A.

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
SP	−0.000	−0.000	0.000	0.020*	0.030**
	(0.000)	(0.000)	(0.000)	(0.010)	(0.010)
Size	−0.000***	−0.000***	−0.000***	−0.030***	−0.030***
	(0.000)	(0.000)	(0.000)	(0.010)	(0.010)
Book-to-Market	−0.000	−0.000	−0.000	−0.005	−0.010
	(0.000)	(0.000)	(0.000)	(0.010)	(0.010)
Leverage	−0.001**	−0.001**	−0.001**	−0.160***	−0.160***
	(0.001)	(0.001)	(0.001)	(0.050)	(0.050)
ROA	−0.001	−0.001	−0.001	−0.250**	−0.230**
	(0.001)	(0.001)	(0.001)	(0.120)	(0.110)
Cash Holding	0.000	0.000	0.000	0.130**	0.150**
	(0.001)	(0.001)	(0.001)	(0.060)	(0.060)
Dividend Dummy	0.001**	0.001**	0.000**	0.020	0.010
	(0.000)	(0.000)	(0.000)	(0.020)	(0.020)
Tangibility	0.001	0.001	0.001	0.090*	0.090*
	(0.001)	(0.001)	(0.001)	(0.050)	(0.050)
Pre-filing RMSE	0.000	0.000	−0.000	−0.010	−0.010
	(0.000)	(0.000)	(0.000)	(0.010)	(0.010)
ESG	−0.000	−0.000	−0.000	−0.001	−0.001
	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)
Board Size	−0.000	−0.000	−0.000	−0.003	−0.003
	(0.000)	(0.000)	(0.000)	(0.004)	(0.004)
Board Independence	−0.000**	−0.000**	−0.000**	−0.001	−0.001
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
Institutional Ownership	0.001	0.001	0.000	0.060	0.040
	(0.001)	(0.001)	(0.001)	(0.060)	(0.060)
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.05	0.05	0.05	0.12	0.13
Observations	4,592	4,438	4,177	4,395	3,938

Table 12: Impact of SCI on Shareholder Proposals (Instrumental Variables Approach)

This table reports the results of the two-stage least squares (2SLS) regressions examining the effect of SCI on future shareholder proposals. The instrumental variable (IV) for *SCI* is *Log Words*. Panel A reports first-stage regression results. Panel B reports results using contemporaneous *Log Words* as the IV. Panel C reports results using *Log Words* lagged by one year as the IV. Standard errors in the second-stage regression are computed using bootstrap. All regressions include industry or year fixed effects (not reported). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors are reported in parentheses. All variables are as defined in Appendix A.

Panel A. First-Stage Regression Results

	(1) SCI	(2) Mean SCI		(3) SCI_t+1	(4) Mean SCI_t+1
Log Words	−0.210***	0.060***	Log Words	−0.160***	0.060***
	(0.010)	(0.001)		(0.010)	(0.001)
Controls	Yes	Yes		Yes	Yes
Industry FE	Yes	Yes		Yes	Yes
Year FE	Yes	Yes		Yes	Yes
F-Statistic	14.48	77.17		12.81	74.25
Adjusted R^2	0.09	0.35		0.08	0.34
Observations	5,313	5,313		4,758	5,304

Panel B. Control Function Method (Contemporaneous IV)

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
SCI	0.091	0.233**	0.151	0.397**	0.429**
	(0.077)	(0.093)	(0.095)	(0.165)	(0.169)
First-Stage F-Statistic	14.48	14.48	14.48	77.17	77.17
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.26	0.26	0.27	0.26	0.26
ROC Curve	0.83	0.83	0.83	0.83	0.82
Observations	5,136	4,395	3,938	4,863	4,570

Panel C. Control Function Method (Lagged IV)

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
SCI	0.124	0.213**	-0.027	0.458***	0.117
	(0.085)	(0.098)	(0.101)	(0.169)	(0.184)
First-Stage F-Statistic	12.81	12.81	12.81	74.25	74.25
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.26	0.26	0.24	0.26	0.24
ROC Curve	0.82	0.82	0.82	0.82	0.82
Observations	5,136	4,395	3,938	4,863	4,570

Table 13: Impact of SCI on Shareholder Proposals (Excluding Financial Firms)

This table reports regression results related to the impact of SCI on shareholder proposals based on a sample excluding financial firms (SIC code 6000–6700). All regressions include industry or year fixed effects (not reported). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors are reported in parentheses. All variables are as defined in Appendix A.

	(1) t+1	(2) t+1	(3) t+2	(4) t+3	(5) [t+1, t+2]	(6) [t+2, t+3]
SCI		0.018	0.222**	0.071	0.261	0.305*
		(0.084)	(0.097)	(0.102)	(0.168)	(0.171)
Size	0.999***	1.000***	1.069***	1.090***	1.024***	1.033***
	(0.045)	(0.045)	(0.051)	(0.055)	(0.047)	(0.050)
Book-to-Market	0.486***	0.486***	0.484***	0.551***	0.458***	0.476***
	(0.076)	(0.076)	(0.084)	(0.090)	(0.078)	(0.083)
Leverage	1.049***	1.053***	1.142***	1.124***	1.010***	0.965***
	(0.250)	(0.251)	(0.279)	(0.303)	(0.262)	(0.277)
ROA	1.170**	1.176**	1.367***	1.230**	1.130**	1.164**
	(0.461)	(0.462)	(0.501)	(0.583)	(0.475)	(0.557)
Cash Holding	−0.126	−0.127	−0.305	−0.204	−0.226	−0.419
	(0.326)	(0.326)	(0.362)	(0.398)	(0.343)	(0.367)
Dividend Dummy	0.333***	0.332***	0.307***	0.248**	0.313***	0.275***
	(0.096)	(0.096)	(0.107)	(0.113)	(0.100)	(0.104)
Tangibility	0.045	0.045	0.050	0.157	0.111	0.227
	(0.239)	(0.239)	(0.260)	(0.276)	(0.249)	(0.258)
Pre-filing RMSE	0.164***	0.164***	0.325***	0.297***	0.157***	0.163***
	(0.054)	(0.054)	(0.072)	(0.077)	(0.058)	(0.061)
ESG	0.001	0.001	0.003	−0.003	−0.003	0.002
	(0.016)	(0.016)	(0.018)	(0.019)	(0.017)	(0.018)
Board Size	−0.006	−0.006	0.008	0.021	0.003	0.004
	(0.024)	(0.024)	(0.027)	(0.029)	(0.025)	(0.027)
Board Independence	−0.003	−0.003	−0.003	−0.005	−0.005	−0.003
	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)
Institutional Ownership	1.608***	1.607***	1.462***	1.538***	1.468***	1.494***
	(0.286)	(0.286)	(0.322)	(0.361)	(0.303)	(0.328)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.26	0.26	0.26	0.27	0.26	0.26
ROC Curve	0.83	0.83	0.83	0.84	0.83	0.83
Observations	4,319	4,319	3,676	3,300	4,067	3,820

Table 14: Impact of SCI on Shareholder Proposals (Proposal Outcome)

This table reports regression results related to the impact of SCI on shareholder proposals by proposal outcome. Panel A reports results for passed shareholder proposals. Panel B presents results for failed shareholder proposals. All regressions include industry or year fixed effects (not reported). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors are reported in parentheses. All variables are as defined in Appendix A.

Panel A. Proposal Outcome: Passed

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
SCI	0.109	0.111	0.042	0.474***	0.604***
	(0.097)	(0.112)	(0.123)	(0.182)	(0.190)
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.26	0.26	0.25	0.26	0.25
ROC Curve	0.85	0.85	0.84	0.85	0.84
Observations	4,569	3,916	3,524	4,343	4,094

Panel B. Proposal Outcome: Failed

	(1) t+1	(2) t+2	(3) t+3	(4) [t+1, t+2]	(5) [t+2, t+3]
SCI	0.151	0.969**	0.247	0.478	0.088
	(0.339)	(0.435)	(0.435)	(0.602)	(0.696)
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.65	0.69	0.72	0.67	0.69
ROC Curve	0.98	0.98	0.99	0.98	0.99
Observations	1,069	910	809	1,001	938

Table 15: Impact of SCI on Shareholder Proposals (Controlling for Confounding Events)

This table reports regression results related to the impact of SCI on shareholder proposals controlling for confounding events. Panel A reports results controlling for industry spillover of shareholder activism. Panel B presents results controlling for confounding effect of earnings announcements. All regressions include industry or year fixed effects (not reported). *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors are reported in parentheses. All variables are as defined in Appendix A.

Panel A. Industry Spillover

	(1) t+1	(2) t+1	(3) t+2	(4) t+3	(5) [t+1, t+2]	(6) [t+2, t+3]
SCI		0.066	0.151*	0.053	0.265*	0.274*
		(0.078)	(0.090)	(0.094)	(0.156)	(0.160)
Industry SP	0.026***	0.026***	0.026***	0.032***	0.025***	0.028***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.26	0.26	0.26	0.28	0.26	0.26
ROC Curve	0.83	0.83	0.83	0.84	0.83	0.83
Observations	5,136	5,136	4,395	3,938	4,863	4,570

Panel B. Earnings Announcements

	(1) t+1	(2) t+1	(3) t+2	(4) t+3	(5) [t+1, t+2]	(6) [t+2, t+3]
SCI		0.196	0.306**	0.239*	0.311	0.307
		(0.127)	(0.134)	(0.141)	(0.227)	(0.245)
SCI×EPS Dummy		−0.212	−0.287	−0.266	−0.100	−0.172
		(0.162)	(0.180)	(0.190)	(0.328)	(0.349)
EPS Dummy	−0.139	−0.040	0.010	0.037	−0.081	−0.025
	(0.086)	(0.116)	(0.127)	(0.137)	(0.147)	(0.157)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.24	0.24	0.25	0.25	0.25	0.25
ROC Curve	0.82	0.82	0.82	0.83	0.82	0.83
Observations	4,800	4,800	4,115	3,701	4,115	3,701

Appendix A. Variable Definition

Variable	Definition	Source
Dependent Variables		
SP	A binary variable that takes a value of one if the firm receives shareholder proposals in a given year, and zero otherwise.	ISS
Readability Variables		
SCI	The absolute value of the difference between the connotation of the financial text calculated according to ngram, valence shifter approach in Anand et al. (2021b) and the unigram LM dictionary and bag-of-words approach (Loughran and McDonald, 2011).	
Fog Index	0.4×(average number of words per sentence + percent of complex words). High value of Fog Index corresponds less readable text.	Loughran and McDonald (2014)
Vocabulary	The natural logarithm of the word count from the 10-K, based on words appearing in the Loughran and McDonald (2011) Master Dictionary.	Loughran and McDonald (2014)
Log Words	The natural logarithm of the word count from the 10-K, based on words appearing in the Loughran and McDonald (2011) Master Dictionary.	Loughran and McDonald (2014)
Log File Size	The natural logarithm of the file size in megabytes of the SEC EDGAR "complete submission text file" for the 10-K filing.	Loughran and McDonald (2014)
Control Variables		
Size	The natural logarithm of a firm's market value of equity.	Compustat
Book-to-Market	Book-to-market ratio. The natural logarithm of the ratio of book value of equity to market value of equity.	Compustat
Leverage	Total liabilities (Compustat item "lt") divided by total assets (Compustat item "at").	Compustat
ROA	Return on assets. Income before extraordinary items (Compustat item "ib") divided by total assets (Compustat item "at").	Compustat
Cash Holding	Cash and short-term investments (Compustat item "che") divided by total assets (Compustat item "at").	Compustat
Dividend Dummy	A dummy that takes a value of one if a firm paid dividends (Compustat item "dvc">0)in a fiscal year, and zero otherwise.	Compustat
Tangibility	Total net property, plant and equipment divided (Compustat item "ppent") by total assets (Compustat item "at").	Compustat
Pre-filing RMSE	Stock return volatility computed using the root-mean-square error(RMSE) from a market model in an estimation window [-257, -6] before the 10-K file date, with a minimum of 60 observations.	CRSP

Variable	Definition	Source
ESG	Number of strengths subtracts number of concerns across six dimensions (i.e., community relations, diversity, employee relations, environment, human rights, and product safety) for each firm-year.	KLD
Board Size	Number of directors on the board.	BoardEx
Board Independence	The ratio of number of non-executive directors to total number of directors.	BoardEx
Institutional Ownership	Sum of all institutional holdings in a firm's stock divided by market capitalization at the end the calendar year.	Factset
EPS Dummy	A dummy that takes a value of one if EPS is above the sample median for the industry-year pair.	I/B/E/S
Industry Spillover	The number of shareholder proposals for each industry each year preceding the proxy proposal date of the focal company.	ISS

Appendix B. Semantic Complexity of Financial Texts

Anand et al. (2021a) introduce a new proxy of financial texts' readability: the semantic complexity index (SCI). Semantically more complex text is harder-to-interpret, and hence difficult to read, leading to more ambiguity, and higher investor uncertainty. SCI is calculated as the texts' incremental connotation, with and without multi-clausal phrases and valence shifters. Higher incidence of multi-clausal phrases (e.g., 'buoyancy in animal spirits') and/or valence shifters (e.g., 'heightened', 'more', 'never', 'slightly' etc.) increases the semantic complexity of texts, makes it harder to read, and creates more ambiguity in the mind of the reader. In principle, such complex, nuanced writing could be used to obfuscate, prevaricate or create uncertainty with regard to the connotation of the underlying text.

Following Anand et al. (2021a), in order to explicitly show how connotation is derived and the SCI computed, we produce a collection of five hypothetical sentences below.

1. We expect to witness an increase in business activity.
2. We expect to witness a *slight* increase in business activity.
3. We expect to witness a *major* increase in business activity.
4. We expect to witness *not much* increase in business activity.
5. We expect to witness a *large* increase in business activity *in spite of* Covid.

For all hypothetical example sentences presented above, the unigram LM dictionary methodology assigns a score of 0. This is because valence shifters are ignored, and words like 'increase' are assigned zero weight since 'profit increase' has positive connotation, while 'unemployment increase' has a negative connotation; and hence a unigram approach is incapable of assigning polarity to it. However, the modified approach outlined in Anand et al. (2021b) is successfully able to distinguish between the five example sentences and assigns them scores ranging from 0.02 to 0.26 as specified in Table B1 below. For more details, we refer the reader to Anand et al. (2021a).

Table B1. Example Sentences' Connotation

This table presents the tone calculated using the LM dictionary and bag of words approach and the MCVS approach. 'MCVS' denotes connotation according to the 'multi-clausal phrases with valence shifter' methodology outlined in Anand et al. (2021b). 'LM' denotes the methodology taken from Loughran and McDonald (2011).

	LM score	MCVS score
1.	0	+0.16
2.	0	+0.02
3.	0	+0.25
4.	0	+0.02
5.	0	+0.26