

# COMPETITION AND ANNUAL REPORT READABILITY

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*SUMMARY: This study examines the relation between product market competition and the readability of narrative disclosures in annual reports. Using US data from 1994 to 2019, we find that product market competition is negatively related to the annual report readability. In addition, we find that the negative effect of product market competition on annual report readability is less (more) pronounced in subgroup with high (low) external financing raised. Taken together, our results suggest that product market competition reduces the readability of disclosure narrative in annual report and the needs for external financing mitigate the negative effect on annual report readability.*

*Keywords: Product market competition, Annual report readability, External financing*

## 1 Introduction

Product market competition affects various stakeholders—focal firms, rivals, customers, and lenders—who use annual reports as the primary channel of communication. Product market competition can boost product efficiency and intrafirm knowledge stock, which improve the communication environment wherein rivals compete. However, product market competition can increase misreporting in financial statements for firms to mask poor performance (i.e., obfuscation) or neutralize rivals' counterattacks (i.e., competitive reactions).

We explain how product market competition affects readability using two theories. One is stakeholder theory (i.e., Jones, 1995), wherein managers attempt to build long-term relationships with stakeholders, which is mutually beneficial. The other is the agency theory (Jensen, 2001), wherein managers strive to extract private benefits. For managers to alleviate career concerns raised by increases in product market competition, communicating information in a financial statement is important. Considering both stakeholder and agency perspectives, we posit that product market competition and annual report readability can be related.

On November 19, 2020, the Securities and Exchange Commission (SEC) announced the amendments that would enhance financial disclosure requirements and eliminate duplicate disclosures. The amendments focused on modernizing management's discussion and analysis (MD&A), which shows that regulators and scholars have recently paid extra attention to the MD&A section that provides qualitative information (Brown & Tucker, 2011; Feldman et al., 2010; Wang et al., 2021). Under this movement, the readability of MD&A, which reveals how firms compete in the product market, has become important as firms' competitions are described in financial statements with textual attributes. However, this remains a mixed issue whether competition increases or decreases annual report readability (e.g., Dhaliwal et al., 2014).

Based on 69,957 firm-year observations covering the period 1994–2019, we provide evidence that product market competition negatively affects the annual report readability.

Additionally, the need for external financing mitigates the negative impact of the relationship between product market competition and annual report readability. The results remain qualitatively similar to the main findings with alternative measures of annual report readability and product market competition.

This study contributes to the existing literature in several ways. First, it adds to the accounting research on annual report readability by providing evidence that the linkage between product market competition matters in shaping the publicly available annual reports. Second, our research can practically assist capital market participants in demanding more transparent and easier-to-read information for decision-making. Our findings indicate that the most information-privileged groups, such as banks, with access to a borrower's information, may suffer from less readable annual reports under intensive market competition, but they enjoy better communication with value-relevant information because of the need for external financing. Finally, students and the public will find this study's contents interesting because of the coverage of business topics, financial reports, and competition.

## **2 Literature Review and Hypothesis Development**

### **2.1 Readability**

The textual narrative of accounting information has long been regarded as an important communication channel (i.e., Lo et al., 2017). By communicating financial disclosures with easy-to-understand narratives, information asymmetry between firms and shareholders may be reduced (Beyer et al., 2010; Healy & Palepu, 2001) or written with hard-to-understand and vague narratives to mask poor performance (Li, 2008; Merkl-Davies & Brennan, 2007).

As managers have discretion in presenting narratives in annual reports (Ingram & Frazier, 1983), they can take actions to be more closely aligned with shareholders' interests (i.e., stakeholder theory) or maximize individual interests (i.e., agency theory), and they show different degrees of readability. For example, lower readability reflects poor earnings and profitability (Li, 2008) as a tool to mask poor performance. Ben-Amar and Belgacem (2018) indicate a negative association between corporate social performance and disclosure transparency, which leads to more volatile earnings and widely distributed analyst forecasts (Loughran & McDonald, 2011) and lower stock liquidity and trading volume (De Franco et al., 2015; Lang & Stice-Lawrence, 2015; Miller, 2010).

Although the above studies suggest an agency perspective in financial reporting, other studies suggest that information quality could increase with stakeholder theory proponents. For example, socially responsible companies disclose more transparent and readable reports, curtail opportunistic earnings management (Kim et al., 2012), and present more accurate earnings forecasts (Lee, 2017).

### **2.2 Product Market Competition and Annual Report Readability**

Several factors lead us to hypothesize a link between product market competition and readability. Based on stakeholder theory, managers may pursue ethical standards to establish a firm's relationship with its major stakeholders (shareholders, customers, employees, suppliers, and the community), leading to financial success (Lee, 2017). According to this view, managers in high competition situations may disclose more concise and readable information in their financial

statements to grow interfirm knowledge stock and motivate competitors to remain in collaborative competition (i.e., coopetition). This is because intensive competition improves the communication environment (Dhaliwal et al., 2014; Li, 2010) owing to product efficiency.

Conversely, agency perspective-based opportunistic disclosure hypothesis links the negative association between competition and annual report readability and managers' opportunistic decisions to maximize their own interests rather than those of other stakeholders (Li, 2008). Higher competitive intensity indicates lower effectiveness in transforming resources into advantageous positions (Ljubownikow & Ang, 2020). Therefore, high competition results in lower profits (Li, 2008), higher outcome uncertainty, inefficiency in investment projects, and a high liquidation risk (Grullon & Michaely, 2007; Dhaliwal et al., 2014).

As product market competition intensifies, customers acquire more power and the possibility of switching to a different supplier increases. This power shift decreases a firm's bargaining power with suppliers (Hui et al., 2019), creating a need to mask the risk of losing the anticipated cash flows. A less-readable annual report can be used to mask poor performance (i.e., obfuscation) as the passive voice and long sentences can be purposefully misleading or deceiving (Orwell, 2013), thereby reducing or slowing the market response (Bloomfield, 2008).

To summarize, we predict that product market competition level is related to the annual report readability based on stakeholder and agency perspectives. As the direction of the effect of product market competition on readability remains unclear, we tested the following non-directional hypothesis:

***Hypothesis 1: Product market competition is associated with annual report readability.***

### **2.3 Competition, External Financing Needs and Readability**

In competitive environments, firms create value through superior product development, distinctive advertising, and/or customized promotion to capitalize on profit. Therefore, firms in competitive product markets attempt to relocate available marketing options to restrict competitive forces and improve current competitive positions. However, product market competition makes it difficult for firms to raise funds (Tirole, 2010) and increases idiosyncratic risk and cash flow volatility (Irvine & Pontiff, 2009), thus increasing the pricing of debt (Valata, 2012).

The most commonly discussed benefit of increased transparency and disclosure is that they reduce capital cost. Extant literature demonstrates the link between a firm's information structure and its cost of capital (i.e., Easley & O'hara, 2004; Dhaliwal et al., 2011; Li, 2015; Rjiba et al., 2021). Ertugrul et al. (2017) provide empirical evidence that less-readable annual reports may increase external financing costs (i.e., loan spread). Furthermore, a recent study by Rjiba et al. (2021) supports the idea that a longer and more difficult-to-read annual report increases US equity cost. Similarly, a low readability level in annual reports is associated with fewer timely stock price adjustments (Callen et al., 2013).

Therefore, if competition increases annual report readability, external financing appears to strengthen the positive influence of competition on readability, as this relates directly to reducing information asymmetry for outside shareholders. If competition lowers readability, the need for external financing appears to weaken the negative influence of competition on readability as firms seek to raise capital are motivated to lower costs, which in turn leads to increased readability. Thus, gaining a comprehensive understanding of the impact of the need for external financing on the relationship between competition and the readability of narrative disclosure is important.

***Hypothesis 2: Relationship between competition and readability varies according to firms' need for external financing.***

### **3 Research Design**

#### **3.1 Sample**

We begin with an initial sample of firm-year observations with non-missing readability (BOG index) data available from 1994 to 2020. We then excluded firm-year observations from utilities (SIC 4900–4999) and financial institutions (SIC 6000–6999). Missing competition data available from 1988 to 2019 and missing control variables for conducting the baseline regression reduced the final sample to 69,957 firm-year (8,384 unique firms) observations for the period of 1994–2019.

#### **3.2 Measurement**

##### *3.2.1 Annual Report Readability*

Following prior studies (Bonsall & Miller, 2017; Bonsall et al., 2017; Habib & Hasan, 2020; Chowdhury et al., 2019), we use the BOG index to measure annual report readability. The BOG index captures almost all SEC's guidelines regarding clear investor communication, provides a comprehensive set of factors and is calculated using a pre-programmed algorithm that eliminates bias due to discretion (Chowdhury et al., 2019; Bonsall et al., 2017). The BOG index is inversely related to annual report readability; basically, higher levels of BOG indicate worse readability.

##### *3.2.2 Product Market Competition*

We employ Hoberg and Phillips's (2010, 2016) product market concentration measure (*TNICHHI*: text-based network industry classification Herfindahl–Hirschman index) for our main value of interest, *COMP*. A key advantage of *TNICHHI* is that building classifications changes over time as firms must file a 10-K each year unlike SIC (NAICS).

A higher *TNICHHI* indicates a high concentration and thus less competition as  $TNICHHI = \sum_{i=1}^n (\Pi_i)^2$ , where  $\Pi_i$  is firm  $i$ 's market share of sales for firms within its industry, and  $n$  is the number of firms in the industry. To indicate higher competition with higher *COMP*, *COMP* is measured as  $1-TNICHHI$  as our main value of interest in our analyses.

#### **3.3 Model**

We empirically test whether product market competition is associated with the readability of the disclosure narrative in an annual report by estimating the following regression model (1):

$$\begin{aligned}
BOG_{it} = & \alpha_0 + \beta_1 COMP_{it} + \beta_2 SIZE_{it} + \beta_3 ROA_{it} + \beta_4 MTB_{it} + \beta_5 AGE_{it} + \beta_6 SPE_{it} + \\
& \beta_7 STDROA_{it} + \beta_8 STDRET_{it} + \beta_9 NBSEG_{it} + \beta_{10} NGSEG_{it} + \beta_{11} MNA_{it} + \beta_{12} ADA_{it} \\
& + \beta_{13} DED_{it} + \text{Year fixed effects} + \text{Industry fixed effects} + \varepsilon_{it},
\end{aligned} \tag{1}$$

where the dependent variable, *BOG*, represents annual report readability. Our main variable of interest is *COMP*, which reflects product market competition. We included a set of control variables related to level of annual report readability, following prior studies (Li, 2008; Lo et al., 2017; Habib & Hasan, 2020, Hasan, 2020). We also include year and industry fixed effects in equation (1) to control for variations in the reflection of economic events in accounting over time and across industries. To control for the undesirable effects of outliers, all variables except the dummy variables are winsorized at the 1% and 99% levels.

## 4 Empirical Results

### 4.1 Descriptive Statistics and Correlations

Descriptive statistics for firms in the sample in Panel A of Table 1 indicate that the mean (median) *BOG* index is 84.005 (84.000), representing a poor disclosure narrative on average. The mean (median) is similar to that found in previous studies (e.g., Bonsall & Miller, 2017; Habib & Hasan, 2020; Hasan, 2020). Average *COMP* following Hoberg and Phillips (2010, 2016) is 0.685.

Panel B of Table 1 indicates Pearson correlations between the variables used in our main analyses. The results show that *COMP* is positively correlated with *BOG*, indicating that product market competition is negatively correlated with annual report readability. In Panel C of Table 1, we partition our sample according to product market competition level, *COMP*, wherein firms with higher competition (lower competition) are in the higher (lower) quintiles of product market competition. Consistent with the correlation results, firms in the more competitive quintile group have a higher *BOG* index (i.e., a less-readable narrative of disclosure).

**Table 1. Descriptive Statistics**

**Panel A: Summary Statistics**

	Mean	SD	25%	Median	75%
<i>BOG</i>	84.005	8.046	79.000	84.000	89.000
<i>COMP</i>	0.685	0.284	0.559	0.799	0.897
<i>SIZE</i>	5.750	2.045	4.249	5.689	7.167
<i>ROA</i>	-0.055	0.280	-0.056	0.030	0.073
<i>MTB</i>	3.021	5.064	1.146	2.028	3.638
<i>AGE</i>	2.754	0.720	2.197	2.708	3.296
<i>SPE</i>	-0.022	0.074	-0.015	0.000	0.000
<i>STDROA</i>	0.122	0.210	0.022	0.050	0.125
<i>STDRET</i>	0.150	0.095	0.085	0.125	0.185
<i>NBSEG</i>	0.389	0.532	0.000	0.000	0.693

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	Mean	SD	25%	Median	75%
<i>NGSEG</i>	0.574	0.645	0.000	0.693	1.099
<i>MNA</i>	0.356	0.479	0.000	0.000	1.000
<i>ADA</i>	0.106	0.126	0.028	0.065	0.132
<i>DED</i>	0.641	0.480	0.000	1.000	1.000

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**Table 1. Descriptive Statistics (Cont'd)**

<b>Panel B: Correlation Coefficients</b>														
	<i>BOG</i>	<i>COMP</i>	<i>SIZE</i>	<i>ROA</i>	<i>MTB</i>	<i>AGE</i>	<i>SPE</i>	<i>STD ROA</i>	<i>STD RET</i>	<i>NB SEG</i>	<i>NG SEG</i>	<i>MNA</i>	<i>ADA</i>	<i>DED</i>
<i>BOG</i>	1.000	0.227	0.139	-0.176	0.072	-0.050	-0.063	0.153	0.064	0.051	0.142	0.082	0.070	0.186
		<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
<i>COMP</i>		1.000	0.142	-0.079	0.052	-0.212	-0.034	0.096	0.094	-0.086	-0.050	-0.007	0.022	0.122
			<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	0.050	<.0001	<.0001
<i>SIZE</i>			1.000	0.386	0.029	0.370	0.102	-0.347	-0.402	0.289	0.302	0.313	-0.271	0.093
				<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
<i>ROA</i>				1.000	-0.004	0.238	0.510	-0.475	-0.362	0.146	0.128	0.165	-0.373	-0.076
					0.260	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
<i>MTB</i>					1.000	-0.048	0.034	0.075	0.003	-0.050	0.015	0.007	0.045	0.048
						<.0001	<.0001	<.0001	0.449	<.0001	0.000	0.073	<.0001	<.0001
<i>AGE</i>						1.000	0.101	-0.266	-0.338	0.278	0.203	0.081	-0.171	-0.161
							<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
<i>SPE</i>							1.000	-0.131	-0.152	0.020	-0.006	-0.004	-0.251	-0.034
								<.0001	<.0001	<.0001	0.132	0.273	<.0001	<.0001
<i>STDROA</i>								1.000	0.380	-0.159	-0.110	-0.146	0.336	0.089
									<.0001	<.0001	<.0001	<.0001	<.0001	<.0001
<i>STDRET</i>									1.000	-0.157	-0.113	-0.178	0.261	0.051
										<.0001	<.0001	<.0001	<.0001	<.0001
<i>NBSEG</i>										1.000	0.181	0.201	-0.087	-0.029
											<.0001	<.0001	<.0001	<.0001
<i>NGSEG</i>											1.000	0.175	-0.085	0.035
												<.0001	<.0001	<.0001
<i>MNA</i>												1.000	-0.089	0.029
													<.0001	<.0001
<i>ADA</i>													1.000	0.032
														<.0001
<i>DED</i>														1.000

**Table 1. Descriptive Statistics (Cont'd)**

**Panel C: *BOG* by *COMP* Quintile**

<i>COMP</i> QUINTILE GROUP	<i>BOG</i>
1	81.16
2	82.51
3	84.38
4	85.95
5	86.03

This table reports summary statistics (Panel A) and Pearson correlation coefficients (Panel B) for the variables we use in our main regression. Panel C shows the average of *BOG* index by *COMP* quintile group. Higher *COMP* QUINTILE GROUP represents more competition. Variables are as defined in the appendix 1.

**4.2 Product Market Competition and Annual Report Readability**

In Panel A, Table 2, the coefficient of *COMP* is significantly positive (3.678; t-statistic=17.03), which suggests that product market competition is significantly and positively associated with the *BOG* index. Implying that product market competition is associated with less-readable annual reports, thus supporting our first hypothesis. Panel B of Table 2 presents regression results based on the *COMP* quintile groups. The more competitive groups firms are subject to, the larger the *COMP* coefficient, which also corroborates our first hypothesis.

Overall, these results are consistent with the agency perspective wherein firms in competitive environments are likely to adjust their financial reporting, which can favor managers' individual benefits, thus leading to opportunistic disclosures with long and vague texts, as managers make opportunistic decisions to maximize their own interests rather than other stakeholders (Jensen, 2001).

**Table 2**

**Panel A: The Effect of Competition on Annual Report Readability**

<i>Dependent Variable = BOG</i>	<i>Coefficient</i>	<i>t-statistic</i>
<i>Intercept</i>	86.994***	109.71
<b><i>COMP</i></b>	<b>3.678***</b>	<b>17.03</b>
<i>SIZE</i>	0.560***	12.35
<i>ROA</i>	-2.214***	-10.01
<i>MTB</i>	-0.007	-0.95
<i>AGE</i>	-0.933***	-9.42
<i>SPE</i>	-0.392	-0.76
<i>STDROA</i>	0.532**	2.30
<i>STDRET</i>	5.349***	12.34
<i>NBSEG</i>	1.105***	9.59
<i>NGSEG</i>	0.006	0.05
<i>MNA</i>	0.805***	8.82
<i>ADA</i>	-0.247	-1.03
<i>DED</i>	0.894***	6.23
<i>Industry &amp; year fixed effect</i>		Yes



<i>S.E. clustered by</i>	Firm
<i>N</i>	69,957
<i>Adjusted R<sup>2</sup></i>	47.80%

**Panel B: The Effect of Competition on Annual Report Readability by *COMP* Quintile Group**

<i>COMP</i> QUINTILE GROUP	<i>Coefficient on COMP</i>	<i>t-statistic</i>	<i>N</i>
1	1.787	3.93	13,991
2	4.018	5.06	13,992
3	8.718	5.10	13,991
4	13.687	4.70	13,992
5	26.301	5.78	13,991

**Note:** This table presents our result for the first hypothesis (Panel A) and the coefficients on our variable of interest (*COMP*) by *COMP* quintile groups (Panel B). For brevity, the coefficients on control variables are not presented in Panel B. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively, using two-tailed tests. P-values are calculated using clustered standard errors at the firm level. All variables are as defined in the appendix 1.

### 4.3 Effect of External Financing

We examine the effect of external financing needs on the association between product market competition and annual report readability. In Table 3, we find that the coefficient of *COMP* (3.225; t-statistic=13.10) in the subsample of firms with high external financing is lower than that (4.056; t-statistic=15.58) in the subsample of firms with low external financing with significant difference at the 1% level, supporting our second hypothesis.

Our result implies that managers structure financial information to mask poor stakeholder performance. However, the need for external financing funds affects managers to write clear texts to embed stakeholder pressure by reducing information risk which raises the cost of external capital.

**Table 3**

**The Effect of External Financing on the Relation between Competition and Annual Report Readability**

<i>Dependent Variable = BOG</i>	<i>High External Financing (EF)</i>		<i>Low External Financing (EF)</i>	
	<i>Coefficient</i>	<i>t-statistic</i>	<i>Coefficient</i>	<i>t-statistic</i>
<i>Intercept</i>	88.459***	99.53	85.706***	95.12
<b><i>COMP</i></b>	<b>3.225***</b>	<b>13.10</b>	<b>4.056***</b>	<b>15.58</b>
<i>SIZE</i>	0.542***	10.64	0.550***	10.16
<i>ROA</i>	-1.571***	-6.33	-3.155***	-10.77
<i>MTB</i>	-0.001	-0.08	-0.019	-1.61
<i>AGE</i>	-0.951***	-8.81	-0.812***	-6.66
<i>SPE</i>	-1.498**	-2.33	1.516**	2.19
<i>STDROA</i>	0.107	0.40	1.259***	3.99
<i>STDRET</i>	4.611***	8.65	5.819***	9.98
<i>NBSEG</i>	0.978***	7.54	1.227***	8.73
<i>NGSEG</i>	-0.040	-0.33	0.056	0.43

<i>MNA</i>	0.742***	6.70	0.766***	6.84
<i>ADA</i>	-0.396	-1.40	0.064	0.17
<i>DED</i>	0.871***	5.58	0.894***	5.21
<b>Comparing coefficients on COMP Chi-squared (p-value) =19.72 (0.000)</b>				
<i>Industry &amp; year fixed effect</i>	Yes		Yes	
<i>Standard error clustered by</i>	Firm		Firm	
<i>N</i>	34,985		34,972	
<i>Adjusted R<sup>2</sup></i>	48.43%		47.37%	

**Note:** This table presents our main result (H2) on subsample based on the external financing raised. \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively, using two-tailed tests. P-values are calculated using clustered standard errors at the firm level. All other variables are as defined in the appendix 1.

#### 4.4 Robustness Tests

To demonstrate the robustness of our main results, we select four annual report readability measures: the *FOG*, *KINCAID*, *FLESCH*, and the *LOGNW* by which a higher (lower) value of the *FOG* index, *KINCAID*, and *LOGNW* (*FLESCH*) indicates worse readability, following prior studies (Li., 2008; Lim et al., 2018; Hasan, 2020). In untabulated results, the coefficient of *COMP* is significantly positive (0.251; t-value:5.02, 0.316; t-value:6.62, and 0.177; t-value=8.80, respectively) when the *FOG*, *KINCAID*, and *LOGNW* are used. Moreover, the coefficient of *COMP* is significantly negative (-1.233; t-value: -7.87), when the *FLESCH* measure is used as another proxy for annual report readability.

Given that the main variable of interest in this study, *COMP*, is based on market share, we also examine our main regression based on the number of firms, *COMP<sub>N</sub>*, measured as 1-(1/number of firms). The coefficient of *COMP* is still positively significant (2.544; t-value=1.74), implying that product market competition is negatively associated with annual report readability; however, significance level is reduced to 10% (untabulated).

As annual reports' readability, particularly related to misreporting or hidden information, and market competition are related to litigation risk (e.g., Noh, 2021; Ganguly et al., 2019), we attempt to control the effect of litigation in our model and find that the coefficient for *COMP* remains positively significant (3.717, t-value=17.20) in untabulated results. Combined, our additional results corroborate our main result that product market competition is negatively associated with annual report readability.

### 5 Conclusion

The empirical evidence in this study implies that market competition can restrain managers' transparent financial reporting and indeed provide incentives for managers to be more closely aligned with individual interests (i.e., compensation); however, the effect is reduced with higher external financing.

Our study contributes to extant research related to the annual report readability. Furthermore, we provide evidence that firms with external financing needs have incentive to provide a transparent and comprehensive understanding of firms when simultaneously considering product market competition. Potential investors may find these results interesting when they evaluate their investment opportunities in competitive product markets. Equity investors view firms with competition as higher-information-risk firms, but this is not always the case when there is a need for external financing, which is related to higher readability. Our study suggests that

product market competition is not just an issue in achieving a competitive advantage; rather, it can be related to the corporate information environment.

However, our study had some limitations. Product market competition is not solely explained by product substitutability but has more dimensions, such as market size and entry costs (e.g., Raith, 2003; Li, 2010). Second, firms may survive by introducing a technological core or sharing the fringes of their industry with rivals. Accordingly, our results differ depending on the strategic interactions between firms. Finally, results obtained from this study might not be fully generalizable to other countries (Merkl-Davies & Brennan, 2007). Countries differ in their institutional, economic, and cultural systems, and all of which may influence how firms adjust their readability level in the product and capital market competition context.

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## Appendix 1. Variable Definitions<sup>1</sup>

Variable	Description
<i>BOG</i>	BOG index is multifaceted measure of readability which is designed to capture a broad set of plain English attributes of disclosure. BOG index data is from <a href="https://host.kelley.iu.edu/bpm/activities/bogindex.html">https://host.kelley.iu.edu/bpm/activities/bogindex.html</a> (Bonsall, Leone, Miller and Rennekamp, 2017).
<i>COMP</i>	Product market competition measured as $1 - TNICHHI$ (Hoberg and Phillips, 2016)
<i>SIZE</i>	The natural log of total assets ( <i>at</i> )
<i>ROA</i>	Return on assets measures as net income before extraordinary items ( <i>ib</i> ) deflated by total assets ( <i>at</i> )
<i>MTB</i>	Market-to-book ratio measured as the market value of equity ( <i>prcc_f-csho</i> ) divided by book value of equity ( <i>ceq</i> )
<i>AGE</i>	Natural log of the number of years the firm is in COMPUSTAT
<i>SPE</i>	Ratio of dollar values of special items ( <i>spi</i> ) divided by total assets ( <i>at</i> )
<i>STDROA</i>	Standard deviation of the income before extraordinary items ( <i>ib</i> ) deflated by total assets ( <i>at</i> ) during the prior five fiscal years
<i>STDRET</i>	Standard deviation of firm-specific monthly stock returns in the prior year
<i>NBSEG</i>	Natural log of number of business segments
<i>NGSEG</i>	Natural log of number of geographic segments
<i>MNA</i>	A dummy variable of 1 for a year in which a company involved in merger and acquisition activities ( <i>aqc</i> >0) and zero otherwise
<i>ADA</i>	Absolute value of discretionary accruals calculated using the performance-adjusted modified Jones Model (Lothari et al., 2005). We estimate the following model for all firms in the same industry based on SIC two-digit industry code with at least eight observations in an industry in a year to get industry-specific parameters for calculating the nondiscretionary component of total accruals (NDACC). DACC is then the residual from model (1), that is, $DACC = ACC - NDACC$ . $ACC_t/TA_{t-1} = 1/TA_{t-1} + (CHSALES_t - CHRECT_t)/TA_{t-1} + PPE_t/TA_{t-1} + ROA_{t-1}$ where $ACC$ =net income ( <i>ni</i> ) minus extraordinary items and discontinued operations ( <i>xido</i> ) minus operating cash flows ( <i>oancf</i> ); $TA$ is total assets ( <i>at</i> ) in year $t-1$ ; $CHSALES$ is change in sales ( <i>sale</i> ) from year $t-1$ to year $t$ ; $CHRECT$ is change in accounts receivables ( <i>RECT</i> ) from year $t-1$ to year $t$ ; $PPE$ is gross property plant and equipment ( <i>ppegt</i> ); $ROA$ is return on assets measured as earnings before extraordinary items and discontinued operations ( $ni-xido$ ) for the preceding year, divided by total assets for the same year.
<i>DED</i>	A dummy variable of 1 if firms' state of incorporation ( <i>incorp</i> ) is in DELAWARE and zero otherwise.
<i>EF</i>	The external financing raised, which is defined as the sum of proceeds from the sale of common and preferred stocks ( <i>sstk</i> ) and from the issuance of

<sup>1</sup> The italicized, lowercase variables are as defined in the COMPUSTAT Fundamental Annual dataset.

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	long-term debt ( <i>dltis</i> ) scaled by average total assets ( <i>at</i> ) (Balakrishnan & Cohen, 2014).
<i>FOG</i>	Estimated as (Words per-sentence + percent-of-complex-words) * 0.4 where words with three syllables or more are deemed as complex words. One of the alternative measures of annual report readability following Li (2008).
<i>KINCAID</i>	Indicative of a document that is understandable by an average US grade level, estimated as $(11.8 * \text{number of syllables/number of words}) + (0.39 * \text{number of words/number of sentences}) - 15.59$ .
<i>FLESCH</i>	Rating reading ease on a scale of 0–100, calculated as $206.835 * (1.015 * \text{number of words/number of sentences}) - (84.6 * \text{number of syllables/number of words})$ .
<i>LOGNW</i>	The natural log of the number of words in a 10-k.
<i>COMPEN</i>	The alternative measure of product market competition which is calculated as $1 - 1/\text{number of firms by industry}$ .
<i>LIT</i>	A dummy variable which equals one if a firm falls in high litigation risk industry as identified by SIC codes 2833–2836, 3570–3577, 3600–3674, 5200–5961, and 7370 and zero otherwise (Wang et al., 2018).

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