Shareholder Litigation Risk and Readability of Corporate Financial Disclosures: Evidence from Natural Experiments[1]

Abhishek Ganguly, *Price College of Business, University of Oklahoma*

Arup Ganguly, *Ole Miss Business, University of Mississippi*

Lin Ge, *Ole Miss Business, University of Mississippi*

Chad J. Zutter, *Katz School of Business, University of Pittsburgh*

This draft: May 2021

ABSTRACT

We use a natural experiment to weigh conflicting theories on the impact of shareholder litigation risk on the readability of corporate financial disclosures. In response to a Ninth Circuit Court of Appeals ruling that unexpectedly reduced litigation risk, we find that firms in the Ninth Circuit significantly improved the readability of their financial disclosures relative to control firms. This supports the idea that litigation risk discourages firms from providing financial disclosures with greater readability. Our finding is robust to different linguistic complexity measures and matching techniques, fixed effects for both time-invariant and time-varying unobservable confounders, and an alternative natural experiment.

Keywords: Shareholder litigation risk, Corporate financial disclosure, Textual analysis, Endogeneity

JEL: G32, G38, K22, K40

---

[1] We are grateful for helpful discussions with Shiu-Yik Au (discussant), Bernard Black, Brian Blank, Jörn Debener (discussant), David Denis, Mark Humphery-Jenner (discussant), Steve Karolyi, Mark Klock, Andy Koch, Kenneth Lehn, Michelle Lowry, Bill McDonald, Bill Megginson (discussant), Sara Moeller, Joel Sobel, Stephen Teng Sun (discussant), Alvaro Taboada, Andrew Van Buskirk, and Robert Van Ness. We thank the seminar participants at the Mississippi State University (MSU), and the conference participants at the annual meetings of the Financial Management Association (FMA, 2019), the Southern Finance Association (SFA, 2019), the 32nd Australasian Finance & Banking Conference (AFBC, 2019), the Sydney Banking and Financial Stability Conference (SBFC, 2019), the World Finance & Banking Symposium (2019), the Southwestern Finance Association (SWFA, 2020), and the Eastern Finance Association (EFA, 2021) for their helpful comments. We are also grateful to the organizers of the International Conference of the French Finance Association (AFFI) and the European Financial Management Association (EFMA) for including our paper in their respective 2021 annual meetings. All errors are our own. Corresponding author: Abhishek Ganguly, University of Oklahoma, Price College of Business, Division of Finance, 307 West Brooks, Norman, OK 73019; Phone: 405-325-5591; E-mail: abhiganguly@ou.edu.

1. Introduction

Financial researchers have long been unable to fully reconcile the relation between shareholder litigation risk and corporate financial disclosures because it is fraught with endogeneity concerns (Healy and Palepu, 2001; Field, Lowry, and Shu, 2005; Lowry, 2009; Hanley and Hoberg, 2012; and Leuz and Wysocki, 2016). There are competing views regarding the causal impact of shareholder litigation risk on financial disclosures. One view, notes, that shareholder litigation is often triggered by voluntary disclosures that *ex-post* are perceived as misrepresentative and, thus, *discourages* firms from providing highly readable financial disclosures in response to *ex-ante* shareholder litigation risk. Whereas, another view suggests that the *ex-ante* threat of shareholder litigation serves as a deterrent to poor financial disclosures and, thus, *encourages* firms to voluntarily provide highly readable disclosures in the hope of avoiding costly litigation. A third view argues that shareholder litigation is often ineffective and, thus, *irrelevant* with respect to the readability of firms' financial disclosures. Further challenging the empiricist, is the possibility that litigation risk and financial disclosures are jointly determined by unobservable characteristics. There is also the possibility of measurement error in quantifying linguistic complexity, which arguably could measure both value-relevant and obfuscated information (Bushee, Gow, and Taylor, 2018; and Cookson, Moon, and Noh, 2020), leading to biased estimates. In this paper, we address these primary sources of endogeneity by using several identification techniques that exploit an exogenous shock of an unanticipated court ruling that reduced litigation threat only for a subset of firms in the United States.

Recently, Crane and Koch (2018) provided conclusive empirical evidence that, in 1999, the Ninth Circuit Court of Appeals ruling In re Silicon Graphics, Inc. led to an unexpected and sudden reduction in the threat of litigation for firms headquartered in the Ninth Circuit that

resulted in the number of shareholder class action lawsuits in the Ninth Circuit plunging 43% compared to a 14% rise in other circuits.[2] Also, legal scholars (Johnson, Nelson, and Pritchard, 1999; Gibney, 2000; and Wilson, 2002) point out that the In re Silicon Graphics, Inc. ruling made it harder for the shareholders of firms located in the Ninth Circuit (i.e., the firms headquartered in Alaska, Washington, Oregon, Idaho, Montana, California, Nevada, Arizona, and Hawaii) to bring a shareholder class action lawsuit as it requires the litigants to establish that the defendants acted with "deliberate recklessness."[3] We exploit this geographic and time-series exogenous variation in the threat of shareholder litigation using a difference-in-differences empirical setup and find that, compared to the control firms (i.e., the non–Ninth Circuit firms matched on the closest estimated propensity score based on pretreatment observable firm characteristics), the treated firms (i.e., the Ninth Circuit firms) significantly improved the readability of their financial disclosures after the Ninth Circuit Court of Appeals ruling. We rely on widely used measures in natural language processing to capture readability of the texts of the Securities and Exchange Commission (SEC) filings.[4] Such improvements in readability after the Ninth Circuit legal shock are robust to the use of different matching techniques and readability measures, various observable controls, and multidimensional fixed effects that control for the existence of plausible unobserved confounders.[5] Finally, we conduct a similar matching-based, fixed-effect difference-in-differences analysis using a legislative shock on the threat of

[2] Crane and Koch (2018) provide a detailed background for the 1999 In re Silicon Graphics, Inc. ruling. Three other concurrent papers that have used this ruling as an exogenous variation in firms' litigation risk are Houston, Lin, Liu, and Wei (2019), Dong and Zhang (2019), and Huang, Roychowdhury, and Sletten (2020). While Houston et al. (2019) and Dong and Zhang (2019) use the Ninth Circuit ruling and find that firms issue fewer management earnings forecasts following the ruling, Huang et al. (2020) use this shock based research design to examine the impact of litigation risk on real earnings management.

[3] Note that "deliberate recklessness" requires the plaintiffs to prove that the "intent" of the defendant was to cause harm to the shareholders' wealth and is, therefore, a stricter requirement than simply "recklessness."

[4] Loughran and McDonald (2016), Das (2014), and Kearney and Liu (2014) provide comprehensive surveys on the use of natural language processing and textual analysis in finance and accounting literature.

[5] We use nine different readability measures that have appeared in the extant literature to alleviate the concern of measurement error.

shareholder litigation in the state of Nevada and find consistent results. Similar findings of a negative relation between the threat of shareholder litigation and transparency in disclosures, using a different natural experiment, yield the same conclusion and address the general criticisms of single shock-based designs, lending credence to the results' external validity.

Our paper contributes to the existing literature on the relation between shareholder litigation risk and corporate disclosures by accounting for the role of non-numerical, textual forms of disclosure that have been mainly ignored in the earlier literature (Core, 2001), and have only recently garnered attention in the finance and accounting literature over the last decade (Loughran and McDonald, 2016). While discussing the role of hard versus soft information in financial markets, Liberti and Petersen (2019, p. 24) note,

> A typical firm's 10K filing can run into hundreds of pages. Its financial statements (e.g., its income statement and balance sheet) take up half a dozen pages at most. However, a large fraction of the vast studies that try to explain the changes in equity values with firm data relied only on these accounting numbers and macroeconomic data. This changed when academics started including textual information in regressions by coding the text into numerical scores.

Our empirical design controls for hard and quantitative financial and accounting information measures (using proxies such as market value, market-to-book, return on assets, earnings growth, sales growth, negative net income, stock return, and stock volatility), while focusing on the soft information estimation of the causal impact of litigation risk on the readability of Form 10-K filings. Form 10-K filings are arguably the most important financial disclosure documents for publicly listed firms and are also among the most often cited SEC filings in securities class action litigants' complaints (Rogers, Van Buskirk, and Zechman, 2011). Readability is distinct from the quantity or degree of disclosure. Greater disclosure in the narratives of firms' filings does not necessarily mean that more value-relevant information is disseminated, as more text can also be used to obfuscate information (Bushee, Gow, and Taylor, 2018). However, more readable

10-Ks can enhance transparency and relevant information in disclosures (Loughran and McDonald, 2014; Hwang and Kim, 2017; and Bonsall and Miller, 2017).

Our study contributes to the ongoing debate in the literature regarding the relation between litigation risk and financial disclosures by providing a credible causal inference. This is because the use of geographic and time-series exogenous variation in the threat of shareholder litigation and different readability measures leads to our empirical design being less susceptible to different sources of endogeneity, such as reverse causality and measurement error (Roberts and Whited, 2013). Our shock-based research design, using difference-in-differences with a carefully balanced covariate propensity score–matching identification strategy and multidimensional fixed effects, also provides a methodological contribution within the textual analysis literature (Atanasov and Black, 2016). Our work also relates to recent theoretical developments in the behavioral finance literature that highlight the role of verbal communication in disclosures (Hirshleifer, 2015) and the evolving discussion on the need for regulation of corporate disclosures (Admati and Pfleiderer, 2000; and Goldstein and Leitner, 2018).

Finally, our study relates to recent papers by Rogers, Van Buskirk, and Zechman (2011), Hanley and Hoberg (2012), and Bourveau, Lou, and Wang (2018) that analyze narratives in disclosures in relation to litigation risk. Rogers, Van Buskirk, and Zechman (2011) conduct an in-depth analysis of the disclosure tone of 20 randomly selected firms from their sample of sued and unsued firms and provide evidence that the use of positive tone in narratives increases litigation risk, whereas our paper analyzes the readability of narratives in 10-Ks for a comprehensive sample of publicly listed firms, using a quasi-natural experiment and an exogenous shock to the threat of litigation, to establish causality. Hanley and Hoberg's (2012) study is restricted to IPO-related litigations and the analyses of IPO prospectuses. Using textual

analyses of IPO prospectuses, the authors find that greater disclosure reduces the likelihood of IPO-related litigations. Our study looks at the risk of all types of shareholder class action litigations. More recently, Bourveau, Lou, and Wang (2018) use the staggered adoption of universal demand (UD) laws to study the impact of risk of derivative lawsuits, a special kind of shareholder lawsuit, on the quantity of disclosure. They find that firms significantly increase their disclosure after the UD state-level laws are passed. In contrast, other than the methodological differences, our study analyzes the impact of the risk of all kinds of shareholder class action litigations on the readability of disclosures, as measured with readability indices, which is distinct from the quantity of disclosure. Finally, current work by Huang, Roychowdhury, and Sletten (2020) is most similar to our study as the authors also use the Ninth Circuit shock, but they focus on real earnings management (REM) by firms, as opposed to the readability of financial disclosures, and find that firms headquartered in the Ninth Circuit increase their REM post-shock.

The remainder of the paper is organized as follows. Section 2 develops the testable hypotheses. Section 3 provides details of the data used and presents the descriptive statistics. Section 4 describes the empirical methodology for estimating the causal effects of the threat of litigation and presents the main results. Section 5 presents several robustness tests. Section 6 tests our main findings using another natural experiment. And, finally, we conclude in Section 7.

2. Hypotheses Development

The extant theoretical and empirical literature is divided on the nature of the association between litigation risk and disclosure. Ten years ago, Lowry (2009, p. 159) described a pervasive tension in the literature and said, "...we are still left with the same question: what is the nature of the relation between disclosure and litigation risk?," while more recently, Leuz and Wysocki (2016,

p. 552), noted in their survey paper that "…the evidence regarding the effects of litigation on disclosure is mixed and also quite subtle or nuanced…" The theoretical literature provides useful insights and raises intriguing questions for further empirical work targeted at identifying the causal nature of that relation.

The unraveling and full disclosure results of theoretical models along the lines of Grossman (1981) suggest that if a firm can disclose information without cost, it will always do so in equilibrium; otherwise, the absence of disclosure would be interpreted as bad news. Practically speaking, the threat of shareholder litigation due to financial disclosures makes the disclosure of information potentially costly for firms. Litigation costs include both direct costs, such as those for legal representation and settlement, and indirect costs, such as reputational and opportunity costs (Karpoff and Lott, 1993). According to Cornerstone Research (2017), total settlement costs for securities class action lawsuits during the period from 1996 through 2016 were more than $93 billion, with an average cost of $57.7 million. An indirect cost of shareholder litigation that numerous studies have documented is a significant negative stock price reaction to the filing of lawsuits (Bizjak and Coles, 1995; Bhagat, Bizjak, and Coles, 1998; Gande and Lewis, 2009; and Klock, 2015).

Even in the presence of disclosure costs, at any point in time, firms can be in equilibrium with respect to the tradeoff between the costs and benefits of voluntary financial disclosures such that an exogenous shock to either the costs or benefits would cause a firm to adjust its disclosures. Because the threat of shareholder litigation foreshadows potential disclosure costs, it is reasonable to think that firms might adjust their financial disclosures in response to litigation risk. We offer three competing hypotheses for the relation between shareholder litigation risk and the readability of corporate financial disclosures.

Anecdotal and empirical evidence suggest that optimistic, forward-looking voluntary disclosures have *ex-post* been perceived as misleading and, therefore, trigged shareholder lawsuits (Banerjee, Humphery-Jenner, Nanda, and Tham, 2018). Given this *ex-post* treatment of financial disclosures, shareholder litigation risk may *discourage* firms from providing financial disclosures with high readability in the hope of not inciting costly litigation. Instead, firms' financial disclosures might rely on cheap talk, noisy communication, or obfuscation; hence one would expect a negative relation between shareholder litigation risk and the readability of financial disclosures.

Discouragement Hypothesis: Shareholder litigation risk is negatively associated with the readability of corporate financial disclosures.

However, disclosures that rely on cheap talk (Crawford and Sobel, 1982), noisy communication, or obfuscating language (Bushee, Gow, and Taylor, 2018) might elicit shareholders' suspicions and instigate shareholder litigation. Given this *ex-ante* view of financial disclosures, shareholder litigation risk may *encourage* firms to provide highly readable financial disclosures that avoid omissions of material information and the use of obfuscating language; hence one would expect a positive relation between shareholder litigation risk and the readability of financial disclosures.

Encouragement Hypothesis: Shareholder litigation risk is positively associated with the readability of corporate financial disclosures.

It is also possible that, as Jensen (1993) argues, the legal and regulatory systems put in place are "far too blunt" for the threat of litigation to alter the behavior of self-interested managers. Consistent with this notion, Helland (2006) finds little evidence of reputational penalties for directors of companies that face class action securities litigations, as many are frivolous and most

are settled. This line of reasoning suggests that the threat of shareholder litigation is *irrelevant* with respect to firms' financial disclosures; hence one would expect no relation between shareholder litigation risk and the readability of financial disclosures.

Irrelevance Hypothesis: Shareholder litigation risk is not associated with the readability of corporate financial disclosures.

While the *Discouragement Hypothesis* and *Encouragement Hypothesis* predict opposite relations between the risk of shareholder litigation and the readability of corporate financial disclosures, the *Irrelevance Hypothesis* predicts no relation at all. Our empirical methods are aimed at testing these competing hypotheses.

3. Data and Descriptive Statistics

The sample examined in this paper includes all the publicly traded domestic firms headquartered in the United States with information on readability measures available during the period from 1994 to 2014. We omit 1999, as the ruling occurred in the middle of that year.[6] Below, we present and describe the summary statistics of the main dependent and independent variables used in our empirical tests.

Dependent Variables

The main dependent variables in our empirical specifications are the widely used natural language processing and linguistics readability indices. Although these readability formulae often have theoretical underpinnings from linguistics and cognitive psychology, Loughran and McDonald (2014, p. 1643) rightly note that *"what is meant by 'readability' is difficult to define precisely…"* Therefore, we create several different and widely accepted readability measures from the Form 10-Ks that are filed annually with the SEC by publicly listed firms. We focus on the 10-K filing because it is arguably the most informative financial disclosure filed by public

[6] The exact date of this Ninth Circuit Court of Appeals ruling, In re Silicon Graphics, Inc., is July 2, 1999.

firms, most frequently accessed on EDGAR, and most cited in securities class action litigations (Rogers, Van Buskirk, and Zechman, 2011; and Bozanic, Dietrich, and Johnson, 2017). We discuss each of the readability measures below.

1. *Coleman-Liau Readability Index*: Linguists Meri Coleman and T. L. Liau designed the Coleman-Liau formula in 1967. We create Coleman-Liau Readability measures for the narratives in 10-Ks using the formula: ***5.88 (the number of characters divided by the number of words) – 29.6 (the number of sentences divided by the number of words) – 15.8***. Higher values of the Coleman-Liau Index imply lower readability.
2. *Flesch Reading Ease Index (Flesch, 1948)*: This readability index was originally developed by Rudolph Flesch in 1948, and is computed using the formula: ***206.835 – 1.015 (the number of words divided by the number of sentences) – 84.6 (the number of syllables divided by the number of words)***. The Flesch Reading scores vary from 0 and 100. The higher the score, the easier the text is to read. For instance, while scores between 90 and 100 are considered comprehensible by an average 5^{th} grader, scores between 0 and 30 are considered understandable by an average college graduate.
3. *Flesch-Kincaid Readability Index*: The Flesch-Kincaid Readability Index modifies the original Flesch Reading Ease Index and is computed using the following formula: ***0.39 (the number of words divided by the number of sentences) + 11.8(the number of syllables divided by the number of words) – 15.59***. The higher the Flesch-Kincaid score, the more difficult the text is to read. For example, a score of 12 is interpreted as a text that a 12^{th} grader would be able to understand.
4. *RIX Readability Index*: The RIX Readability Index, which is another widely used readability measure, is computed using the formula: ***Number of words of length 7***

characters or more divided by the number of sentences. The higher the RIX Readability score, the more difficult the text is to read.

5. *Gunning Fog Readability Index (Gunning, 1952)*: The Gunning Fog Readability Index was developed by Robert Gunning in 1952 and uses the following formula: ***0.4 (the number of words divided by the number of sentences) + 100 (the number of complex words divided by the number of words)***. The higher the Gunning Fog score, the more difficult the text is to read. Li (2008), Lehavy, Li, and Merkley (2011), and Lo, Ramos, and Rogo (2017) used this readability measure in their respective papers.
6. *Automated Readability Index (Senter and Smith, 1967)*: The Automated Readability Index computes the grade-level readability and is calculated using the formula: ***4.71 (the number of characters divided by the number of words) + 0.5 (the number of words divided by the number of sentences) – 21.43***. Again, the higher the Automated Readability score, the more difficult the text is to read.
7. *Smog Readability Index (Mc Laughlin, 1969)*: The Smog Readability Index was created by G. Harry McLaughlin in 1969 and uses the following formula: ***1.043 * Sqrt (number of complex words * 30/number of sentences) + 3.1291***. The higher the Smog Readability score, the more difficult the text is to comprehend.
8. *Lasbarhets Readability Index (Björnsson, 1968)*: This readability index is also known as the LIX Readability Index and has been widely used to estimate the readability of western European languages, including English. The Lasbarhets Readability Index is calculated using the formula**: *(the number of words divided by the number of sentences) + (the number of words over 6 letters multiplied by 100 and then divided***

by the number of words). The higher the Lasbarhets Readability score, the more difficult the text is to read.

9. *Bog Index*: The newest readability index, the StyleWriter's Bog Index, is the product of recent developments in computational linguistics. An important advantage of the Bog Index is its ability to capture the plain English attributes that have been underscored in the SEC's Plain English Handbook.[7] The Bog Index uses the following formula: ***Bog Index = Sentence Bog + Word Bog – Pep***, where the three components on the right-hand side attempt to capture the attributes that could "bog readers down." Therefore, higher values of the Bog Index indicate poor readability. Wright (2009) and Bonsall, Leone, Miller, and Rennekamp (2017) provide a detailed description of this readability measure. Bonsall et al. (2017) also highlight the advantage of using the Bog Index over a quantity-based measure such as file size, as the file size of Form 10-K over the years is often determined by factors unrelated to the disclosure in narratives, such as pictures, HTML, XML, and PDFs. Other recent papers in finance and accounting literature that successfully use the Bog measure are Hwang and Kim (2017), Bonsall and Miller (2017), Miller (2010), and Rennekamp (2012).[8]

We follow the approach of Li (2008), Miller (2010), Loughran and McDonald (2011, 2014), and Hwang and Kim (2017) in retrieving, cleaning, and parsing the 10-K filings.[9] Both Python scripts and Perl packages are used to create the different readability measures, except the Bog

[7] https://www.sec.gov/pdf/handbook.pdf

[8] In untabulated results, we have also tried file size as a proxy for readability. The results are qualitatively similar, albeit weaker, and we think that this is because of the variation in the file size of 10-Ks due to the inclusion of graphics, pdfs, HTML, XML, and XBRL over the sample period, which is unrelated to textual disclosure (Bonsall et al., 2017).

[9] Professor Bill McDonald has provided several useful documentations on retrieving, cleaning, and parsing SEC filings on his website: https://www3.nd.edu/~mcdonald/

Index, which is computed using StyleWriter version 4.0 software.[10] Table 1 provides summary statistics of these different readability measures.

[Insert Table 1 here]

Panel A of Table 1 provides summary statistics of the nine readability indices for all publicly listed firms included in our study during the 1994 to 2014 period. Panels B and C report the summary statistics by separating the companies into firms headquartered in and located outside the Ninth Circuit, respectively. For instance, both the average and the median Gunning Fog Readability score in all the three panels are approximately 20, which is a post-graduate or post-graduate plus reading level. The standard deviation of the Gunning Fog Readability score for all the firms is 1.177, which is not surprising given the boilerplate nature of the SEC filings. Since Compustat only reports the current headquarters' location, we programmatically extract the information on historical states of firms' incorporation in 1998 from the header sections of the 10-Ks. Figure 1 highlights the geographical location of the states that are in the Ninth Circuit.

[Insert Figure 1 here]

Different indices of readability are developed independently by various theoretical and empirical linguistic researchers at different times and are often based on different theoretical motivations. To ensure that all these measures are at least picking up some common aspects of readability, we provide the correlation matrix among these measures in Table 2.

[Insert Table 2 here]

Table 2 reports high correlations, all significant at the 1% level, between all these measures, which suggests that these measures, although different in their computations and theoretical bases, are predominantly picking up similar aspects of readability. Note that all the readability

[10] http://www.editorsoftware.com/StyleWriter.html

measures, except the Flesch Reading Ease Index, are inversely related to readability and hence the negative correlations for the Flesch Reading Ease Index.

Main Independent Variables

For the main independent variables and controls used in this study, the balance sheet data and auditor information are from Compustat, and firm-level price and returns data are collected from the Center for Research in Security Prices (CRSP). We also collect data on institutional ownership from the Thomson Financial 13F institutional holdings database. Table 3 provides summary statistics of the main independent variables for the sample examined in the paper.

[Insert Table 3 here]

While Panel A of Table 3 provides the summary statistics of the control variables for all firms considered in the study, Panels B and C partition the firms based on their headquarters' location within and outside the Ninth Circuit, respectively. The next section discusses our identification strategy and presents the main results.

4. Identification Methodology and Main Results

To formally test the competing hypotheses that relate to the threat of shareholder litigation on the readability of financial disclosures, we use the Ninth Circuit Court of Appeals ruling In re Silicon Graphics, Inc., which led to an unexpected and sudden reduction in the threat of litigation for firms headquartered in the Ninth Circuit, as a quasi-natural experiment. The following difference-in-differences specification with year and firm fixed effects is tested:

$$Readability_{i,k,t} = \beta_0 + \delta * Treatment_{k,t} + \beta_1 * X_{i,t-1} + \alpha_i + \alpha_t + \varepsilon_{i,k,t,}$$

where *Treatment = Post 1999 Dummy * Ninth Circuit Dummy*.

The dependent variable in the specification above is one of the nine measures of readability of 10-Ks. The subscripts *i*, *k*, and *t* indicate the firm *i*, location of the firm headquarters in state *k*,

and time *t*, respectively. The main independent variable of interest is *Treatment*, which is an interaction of two dummies: whether it is pre- vs. post-1999 and whether the firm is headquartered in the Ninth Circuit (i.e., headquartered in Alaska, Washington, Oregon, Idaho, Montana, California, Nevada, Arizona, and Hawaii). The specification also controls for other firm-level observable characteristics, $X_{i,t-1}$, year (α_t), and firm (α_i) fixed effects, to control for time-varying and time-invariant unobservable factors, respectively. Following the prior literature, the other observable firm-level controls include lagged values of the market value of equity, return on assets (ROA), earnings growth, sales growth, loss indicator (negative net income), market-to-book, Big-8 auditor dummy, stock return, stock volatility, and institutional ownership. Tetlock, Saar-Tsechansky, and Macskassy (2008) and Loughran and McDonald (2011) control for market value and market-to-book in their textual analysis. Rogers, Van Buskirk, and Zechman (2011) find that earnings and sales growth, return on assets, volatility, and loss indicator are correlated with both textual tone and the litigation risk. Hence, we include them as control variables as well. We also control for audit quality of the 10-Ks using the Big-8 auditor codes. We control for stock return as anecdotal evidence suggests that class-action shareholder litigations are often a result of stock price drops that catch investor attention and can be correlated with disclosures. Finally, we control for institutional ownership since Bird and Karolyi (2016) find that it can causally impact firm disclosure. We exclude the year 1999 because the ruling occurred in the middle of the year and analyze the pre-years (1994 to 1998) and post-years (2000 to 2014). The results are in Table 4.

[Insert Table 4 here]

Panel A of Table 4 presents the results for the full sample, for nine different models with various readability indices as the dependent variable. We run separate regressions for each of

these measures of readability, given the high correlations between them as reported in Table 2. We find that in all these models, except for Model 5, the coefficients on the interaction of *Post-1999 Dummy* × *Ninth Circuit Dummy* are negative and significant at the 1% level. For example, the coefficient on the interaction of *Post-1999 Dummy* × *Ninth Circuit Dummy* in Model 3 that uses the Gunning Fog Readability Index is -0.243, significant at the 1% level. Such a coefficient is also economically significant since one standard deviation of the Gunning Fog Readability score for all the firms is only 1.177. This means that the firms in the Ninth Circuit significantly improved the readability of the narratives of 10-Ks as compared to firms outside the Ninth Circuit, once the risk of litigation dropped for these firms due to this unanticipated Ninth Circuit Court of Appeals ruling. The coefficient on the interaction of *Post-1999 Dummy* × *Ninth Circuit Dummy* in Model 5 is also significant at the 1% level, but it is positive. This is because, in the case of the Flesch Reading Ease Index, the higher the index value, the lower is the degree of difficulty in understanding the intended message of the text. In all nine models, we also include both the year and firm fixed effects to control for unobserved heterogeneity (Gormley and Matsa, 2014) and compute the standard errors by clustering at the firm level (Petersen, 2009). Overall, the results strongly support the discouragement hypothesis that predicts a negative relation between the threat of litigation and more readable disclosures.

Panel B of Table 4 repeats the difference-in-differences estimation of the 1999 Ninth Circuit Court of Appeals decision on readability without the controls and the fixed effects. The results are statistically and economically consistent with the baseline estimates of Panel A, indicating that the results are not driven by the choice of control variables.

Propensity Score Matching

Although the Ninth Circuit Court of Appeals ruling was unexpected (Crane and Koch, 2018) and it is unlikely that firms chose their headquarters in anticipation of this ruling, it is plausible that the choice of headquarter location is a function of certain firm-level observable characteristics. Therefore, the next set of tests are conducted using a defined control group that was selected using the nearest neighbor propensity score matching (Rosenbaum and Rubin, 1983) based on pretreatment firm-level characteristics in 1998 such as market value, market-to-book, dividend payer indicator, ROA, and stock return. We also match on industry in 1998 because industry can influence the choice of headquarter location. Therefore, in the following difference-in-differences regressions, we match each treated firm to a control firm that has the closest propensity to be in the Ninth Circuit and is in the same industry (two-digit SIC code). Matching is done with replacement to produce better matches and to reduce bias in the estimates (Roberts and Whited, 2013). Panel A of Table 5 reports the covariate balance table that shows that the treated and control firms are similar in pretreatment observable firm-level characteristics.

[Insert Table 5 here]

Panel B of Table 5 reports that the treated and the control firms are also similar in their pretreatment outcome variables (i.e., only one out of the nine readability measures shows significant differences at the 1% level before the shock). This indicates that treatment and control groups are similar before the treatment, with the similar average characteristics of observed covariates, and therefore plausibly also in unobserved characteristics. Table 6 repeats the base regressions of Table 4 with this propensity score–matched control sample.

[Insert Table 6 here]

Note that the results in Table 6, Panel A are consistent with our baseline regressions and are statistically significant in almost all the models in the presence of both year and firm fixed effects. Moreover, the results shown in Table 6, Panel B confirm that our findings are not driven by our choice of covariates. The next section conducts several robustness checks for our primary results.

5. Additional Analyses and Robustness Checks

5.1 Principal Component Analysis

The main results in the prior section report a significant negative causal relation between the threat of shareholder class action litigations and more transparent disclosures, as measured with various readability measures. Even though we use an identification strategy that relies on an external legal shock, one potential source of endogeneity could be measurement error (Roberts and Whited, 2013). The concern here is whether the readability indices in the study are accurately proxying for readability and transparency. We try to address this issue using nine different measures of readability, but in this section, we attempt to mitigate such endogeneity concerns even further by employing a widely used multivariate statistical procedure, principal component analysis (PCA), that Hotelling (1933) formally introduced. Using vector space transformation, we extract the orthogonal principal components from eight readability measures by withholding their normalized and uncorrelated components and creating an index that comprises all these different readability measures. Then, we rerun our main tests using this index of indices, and the results are in Table 7. Note that the results are consistent with our main results and are significant at the 1% and 5% levels for the full and the matched samples, respectively, as shown in Panel A of Table 7. We also include year and firm fixed effects to control for unobservable characteristics, and the standard errors have been clustered at the firm level. Panel B of Table 7 corroborates that our results are not influenced by the choice of controls.

[Insert Table 7 here]

5.2 Cross-Sectional Analysis

Since the benefits of the Ninth Circuit ruling are related to a firm's exposure to the litigation risk, if the relationships we find earlier between the ruling and the readability of a firm's 10-K disclosures are indeed causal, we should expect them to be stronger among firms with higher exposure to litigation risk. In other words, the negative relation between litigation risk and readability should be more prominent among these firms. To test this, we create a dummy variable "high-risk" to indicate firms in industries with high litigation risks (industries with two-digit SIC codes of 73, 28, 36, 35, and 38 according to the extant literature) such as pharmaceutical, information technology, etc. The results are presented in Table 8a and Table 8b.

[Insert Table 8a here]

[Insert Table 8b here]

In Table 8a, we repeat our primary analyses in Table 4 by adding one more interaction term, "high-risk" to test the differential effects of the Ninth Circuit ruling on industries with high versus low litigation risks. The main variable of interest is the triple interaction term "Ninth Circuit x Post 1999 x High-Risk". Panel A presents the results with full controls and firm and year fixed effects, and Panel B presents the results without the controls and fixed effects. Almost all coefficients are negative and significant at the 1% level, indicating that the negative relationship between litigation risk and readability are indeed stronger among firms with higher exposure to litigation risk. In Table 8b, we repeat the same analyses as in Table 6 with this additional interaction term, "high-risk" on propensity score-matched sample, and the results are qualitatively the same. These findings not only support our main results but also indicate that there is heterogeneity in the effects of litigation risk on the readability of firms' 10-K disclosures.

5.3 Sub-Period Analysis

The Private Securities Litigation Reform Act (PSLRA) of 1995 made the filing of frivolous lawsuits more difficult for all firms (Klock, 2015). Moreover, although firms' SEC filings have been available on EDGAR since 1994, 1996 was the first year that the SEC made electronic filings mandatory for all public companies in the United States. Another event during our sample period that could potentially influence our results was the July 30, 2002 adoption of the Sarbanes-Oxley Act. That Act not only forced firms to improve transparency in their disclosures (Cohen, Dey and Lys, 2005; and Beneish, Billings and Hodder, 2008) but also discouraged risk-taking (Bargeron, Lehn and Zutter, 2010). Finally, the regulatory uncertainty caused by the financial crisis in 2008 could also influence our empirical findings. To make sure that our results are not driven by the above-mentioned confounding events, we rerun our primary specifications for just the 1996 to 2002 subsample, omitting the year of the Ninth Circuit ruling. The results are reported in Table 9. All nine models in Table 9 confirm that our primary results from Table 4 remain consistent both in terms of significance and magnitude.

[Insert Table 9 here]

5.4 Border States Analysis

Another plausible concern could be that readability is changing for firms that are located in the Ninth Circuit, not in response to the unanticipated reduction in the risk of shareholder class action litigations due to this external legal shock in 1999, but as a result of some other observable or unobservable characteristic or event that impacts the firms headquartered only in the western part of the United States. For example, technology firms that already have a higher likelihood of being involved in securities class action lawsuits, also have a greater propensity to be clustered geographically in that region. Moreover, technology firms are also inherently more complex,

which could result in the use of complicated language in the narratives of their 10-K disclosures. We try to mitigate these concerns in several ways.

First, following Crane and Koch (2018), we attempt to address such potential shortcomings by only including firms headquartered in the states on the border of the Ninth Circuit (i.e., Montana, Idaho, Nevada, and Arizona in the Ninth (treated) and North Dakota, South Dakota, Wyoming, Utah and New Mexico in the non-Ninth (control)). Refer to Figure 2 for the intuition of this empirical approach, which uses geographical proximity for identification.

[Insert Figure 2 here]

Second, we focus on the Bog Index for our readability measure, as it is a multifaceted measure of readability and is less susceptible to firm-level complexity. For instance, Bonsall and Miller (2017, p. 627) note that,

> Studies examining readability face the alternative explanation that firm complexity leads to less readable reports. The Bog Index from StyleWriter should mitigate much of the criticism…because its grounding in plain English principles such as the minimization of passive voice should not be theoretically related to firm fundamentals.

Third, in addition to year and firm fixed effects, we also include industry-by-year and state-by-year fixed effects to control for unobserved heterogeneity across industries over time and to control for political, economic, and business cycles that could have potentially coincided with the 1999 Ninth Circuit ruling. We rerun our main specifications with the above-mentioned constraints and report the results in Table 10.

[Insert Table 10 here]

Note that even though we are left with less than 3% of our original observations due to such strict constraints, which greatly reduces the power of our tests, the results are still consistent with our main results and are significant at the 1% level (Model 1, with industry-by-year fixed effects)

or the 10% level (Model 2, with both industry-by-year and state-by-year fixed effects), using the most advanced readability measure (i.e., the Bog Index).

We also conduct additional tests (unreported) to confirm that the paper's results are not influenced by the 1998 Plain English Act. We think that it is primarily because of two reasons: First, the 1998 Plain English Act only applied to certain sections of prospectuses but did not apply to Forms like 10-K, although the SEC did encourage firms to adopt the practice in all their filings. Second, the rule applied to all firms, not just firms with headquarters in the ninth circuit. Finally, in order to reinforce the internal validity of our difference-in-differences estimators, we also conduct falsification tests by repeating the primary analysis on both three years prior to and three years later than the actual onset of the legal shock in 1999. We do not find any significant results (unreported). In the following section, we confirm and complement our main findings using a different natural experiment.

6. Another Natural Experiment

In 2001, Nevada legislators passed an amendment to the Nevada corporate law (Nevada Revised Statutes 78.138(7):7) that provides extra protection for managers and directors of firms incorporated in the state of Nevada. It states that the directors and the officers of the firms incorporated in Nevada can only be held liable if their "(1) act or failure to act constituted a breach of his or her fiduciary duties as a director or officer; and (2) such breach involved intentional misconduct, fraud or a knowing violation of law."[11] This change in the law significantly increases the pleading standards for plaintiffs, thereby suddenly reducing the risk of

[11] https://www.leg.state.nv.us/NRS/NRS-078.html#NRS078Sec138

shareholder litigations for firms that incorporate in Nevada (Donelson and Yust, 2014; and Barzuza and Smith, 2014).[12]

In this section, we use this unexpected legislative shock on the threat of shareholder litigation to confirm and complement our main findings. Table 11 presents difference-in-differences estimations of the effect of the change in the 2001 law on the readability of firms' 10-K filings with the SEC.[13] While Model 1 presents the results for the full sample, Model 2 repeats the test using a propensity score–matched sample. Like the main tests, we match on pretreatment firm-level characteristics in the year 2000, such as market value, market-to-book, dividend payer indicator, ROA, and stock return, and a hard match on industry. Following Table 7, the dependent variable is *Readability Index*, created using principal component analysis from the eight readability measures, including the Automated Readability Index, Flesch-Kincaid Readability Index, Gunning Fog Readability Index, Smog Readability Index, Lasbarhets Readability Index, RIX Readability Index, Coleman-Liau Readability Index, and Bog Index. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. While Panel A of Table 11 presents the results with the control variables and the fixed effects, Panel B presents the estimates without any controls. As can be seen from both Models 1 and 2, and Panels A and B, we find that, as compared to the propensity score–matched peer firms that were not incorporated in the state of Nevada, the treated firms (i.e., the firms that were incorporated in the state of Nevada) significantly improved the readability of their financial disclosures after the 2001 Nevada corporate law change. These results confirm our main findings using an entirely different natural experiment.

[Insert Table 11 here]

[12] Barzuza (2012) provides a detailed description of the 2001 Nevada corporate law change, which was, at least to some extent, unexpected.
[13] We omit the year 2001 since this legislative change in Nevada happened in 2001.

7. Conclusion

Exploiting an exogenous shock of a Ninth Circuit Court of Appeals ruling that reduced the threat of shareholder class action litigation only for a subset of U.S. firms, we find causal evidence that a reduction in the threat of litigation leads to more transparent disclosures by firms as proxied by the readability of the narratives in 10-K filings. These results are not driven by time-varying and time-invariant firm-level unobservable characteristics and are also not dependent on the unobserved heterogeneity across industries over time or political, economic, or business cycles that could have coincided with the 1999 Ninth Circuit Court of Appeals ruling. The results are robust to nine different textual measures of readability, including the Bog Index from StyleWriter, which is arguably less susceptible to the endogenous relation between readability and firm complexity, and to various matching techniques and empirical specifications. Finally, we use the 2001 Nevada legislative action as a different shock-based setup to confirm our main finding that shareholder litigation risk discourages firms from providing financial disclosures with high readability.

References

Admati, A.R. and Pfleiderer, P., 2000. Forcing firms to talk: Financial disclosure regulation and externalities. *The Review of Financial Studies*, *13*(3), pp.479-519.

Atanasov, V. and Black, B., 2016. Shock-based causal inference in corporate finance and accounting research. *Critical Finance Review, 5*: 207–304

Banerjee, S., Humphery-Jenner, M., Nanda, V.K. and Tham, T.M., 2018. Executive overconfidence and securities class actions. *Journal of Financial and Quantitative Analysis*, *53*(6), 2685-2719.

Bargeron, L.L., Lehn, K.M. and Zutter, C.J., 2010. Sarbanes-Oxley and corporate risk-taking. *Journal of Accounting and Economics*, *49*(1), pp.34-52.

Barzuza, M., 2012. Market segmentation: The rise of Nevada as a liability-free jurisdiction. *Va. L. Rev.*, *98*, p.935.

Barzuza, M. and Smith, D.C., 2014. What happens in Nevada? Self-selecting into lax law. *The Review of Financial Studies*, *27*(12), pp.3593-3627.

Beneish, M.D., Billings, M.B. and Hodder, L.D., 2008. Internal control weaknesses and information uncertainty. *The Accounting Review*, *83*(3), pp.665-703.

Bhagat, S., Bizjak, J. and Coles, J.L., 1998. The shareholder wealth implications of corporate lawsuits. *Financial Management*, pp.5-27.

Bird, A. and Karolyi, S.A., 2016. Do institutional investors demand public disclosure? *The Review of Financial Studies*, *29*(12), pp.3245-3277.

Bizjak, J.M. and Coles, J.L., 1995. The effect of private antitrust litigation on the stock-market valuation of the firm. *The American Economic Review*, pp.436-461.

Björnsson, C.H., 1968. *Läsbarhet*. Liber.

Bonsall, S.B., Leone, A.J., Miller, B.P. and Rennekamp, K., 2017. A plain English measure of financial reporting readability. *Journal of Accounting and Economics*, *63*(2-3), pp.329-357.

Bonsall, S.B. and Miller, B.P., 2017. The impact of narrative disclosure readability on bond ratings and the cost of debt. *Review of Accounting Studies*, *22*(2), pp.608-643.

Bourveau, T., Lou, Y. and Wang, R., 2018. Shareholder litigation and corporate disclosure: Evidence from derivative lawsuits. *Journal of Accounting Research*, *56*(3), pp.797-842.

Bozanic, Z., Dietrich, J.R. and Johnson, B.A., 2017. SEC comment letters and firm disclosure. *Journal of Accounting and Public Policy*, *36*(5), pp.337-357.

Bushee, B.J., Gow, I.D. and Taylor, D.J., 2018. Linguistic Complexity in Firm Disclosures: Obfuscation or Information? *Journal of Accounting Research*, *56*(1), pp.85-121.

Cohen, D.A., Dey, A. and Lys, T.Z., 2005. Trends in earnings management and informativeness of earnings announcements in the pre-and post-Sarbanes Oxley periods. *Available at SSRN 658782*.

Cookson, J.A., Moon, S.K. and Noh, J., 2020. Imprecise and Informative: Lessons from Market Reactions to Imprecise Disclosure. *Available at SSRN 3152460*.

Core, J.E., 2001. A review of the empirical disclosure literature: discussion. *Journal of Accounting and Economics*, *31*(1-3), pp.441-456.

Cornerstone Research., 2017. Securities Class Action Settlements. *2017 Review and Analysis*.

Crane, A.D. and Koch, A., 2018. Shareholder litigation and ownership structure: Evidence from a natural experiment. *Management Science*, *64*(1), pp.5-23.

Crawford, V.P. and Sobel, J., 1982. Strategic information transmission. *Econometrica: Journal of the Econometric Society*, pp.1431-1451.

Das, S.R., 2014. Text and context: Language analytics in finance. *Foundations and Trends in Finance*, *8*(3), pp.145-261.

Donelson, D.C. and Yust, C.G., 2014. Litigation risk and agency costs: Evidence from Nevada corporate law. *The Journal of Law and Economics*, *57*(3), pp.747-780.

Dong, H. and Zhang, H., 2019. Litigation Risk and Corporate Voluntary Disclosure: Evidence from Two Quasi-Natural Experiments. *European Accounting Review*, *28*(5), pp.873-900.

Field, L., Lowry, M. and Shu, S., 2005. Does disclosure deter or trigger litigation? *Journal of Accounting and Economics*, *39*(3), pp.487-507.

Flesch, R., 1948. A new readability yardstick. *Journal of Applied Psychology*, *32*(3), p.221.

Gande, A. and Lewis, C.M., 2009. Shareholder-initiated class action lawsuits: Shareholder wealth effects and industry spillovers. *Journal of Financial and Quantitative Analysis*, *44*(4), pp.823-850.

Gibney, B.C., 2000. The end of the unbearable lightness of pleading: Scienter after Silicon Graphics. *UCLA L. Rev.*, *48*, p.973.

Goldstein, I. and Leitner, Y., 2018. Stress tests and information disclosure. *Journal of Economic Theory*.

Gormley, T.A. and Matsa, D.A., 2014. Common errors: How to (and not to) control for unobserved heterogeneity. *Review of Financial Studies*, *27*(2), pp.617-661.

Grossman, S.J., 1981. The informational role of warranties and private disclosure about product quality. *The Journal of Law and Economics*, *24*(3), pp.461-483.

Gunning, R., 1952. The technique of clear writing. *McGraw-Hill*, 1952

Hanley, K.W. and Hoberg, G., 2012. Litigation risk, strategic disclosure and the underpricing of initial public offerings. *Journal of Financial Economics*, *103*(2), pp.235-254.

Healy, P.M. and Palepu, K.G., 2001. Information asymmetry, corporate disclosure, and the capital markets: A review of the empirical disclosure literature. *Journal of Accounting and Economics*, *31*(1-3), pp.405-440.

Helland, E., 2006. Reputational penalties and the merits of class-action securities litigation. *The Journal of Law and Economics*, *49*(2), pp.365-395.

Hirshleifer, D., 2015. Behavioral finance. *Annual Review of Financial Economics*, *7*, pp.133-159.

Hotelling, H., 1933. Analysis of a complex of statistical variables into principal components. *Journal of Educational Psychology*, *24*(6), p.417.

Houston, J.F., Lin, C., Liu, S. and Wei, L., 2019. Litigation risk and voluntary disclosure: evidence from legal changes. *The Accounting Review*, *94*(5), pp.247-272.

Huang, S., Roychowdhury, S. and Sletten, E., 2020. Does Litigation Encourage or Deter Real Earnings Management? (Forthcoming, The Accounting Review) *Available at SSRN 2970311*.

Hwang, B.H. and Kim, H.H., 2017. It pays to write well. *Journal of Financial Economics*, *124*(2), pp.373-394.

Jensen, M.C., 1993. The modern industrial revolution, exit, and the failure of internal control systems. *The Journal of Finance*, *48*(3), pp.831-880.

Johnson, M.F., Nelson, K.K. and Pritchard, A.C., 1999. In Re Silicon Graphics Inc.: shareholder wealth effects resulting from the interpretation of the Private Securities Litigation Reform Act's pleading standard. *S. Cal. L. Rev.*, 73, p.773.

Karpoff, J.M. and Lott Jr, J.R., 1993. The reputational penalty firms bear from committing criminal fraud. *The Journal of Law and Economics*, *36*(2), pp.757-802.

Kearney, C. and Liu, S., 2014. Textual sentiment in finance: A survey of methods and models. *International Review of Financial Analysis*, *33*, pp.171-185.

Klock, M., 2015. Do class action filings affect stock prices? The stock market reaction to securities class actions post PSLRA. *Journal of Business & Securities Law*, *15*(2), p.109.

Lehavy, R., Li, F. and Merkley, K., 2011. The effect of annual report readability on analyst following and the properties of their earnings forecasts. *The Accounting Review*, *86*(3), pp.1087-1115.

Leuz, C. and Wysocki, P.D., 2016. The economics of disclosure and financial reporting regulation: Evidence and suggestions for future research. *Journal of Accounting Research*, *54*(2), pp.525-622.

Li, F., 2008. Annual report readability, current earnings, and earnings persistence. *Journal of Accounting and Economics*, *45*(2), pp.221-247.

Liberti, J.M. and Petersen, M.A., 2019. Information: Hard and soft. *Review of Corporate Finance Studies*, *8*(1), pp.1-41.

Lo, K., Ramos, F. and Rogo, R., 2017. Earnings management and annual report readability. *Journal of Accounting and Economics*, *63*(1), pp.1-25.

Loughran, T. and McDonald, B., 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *The Journal of Finance*, *66*(1), pp.35-65.

Loughran, T. and McDonald, B., 2014. Measuring readability in financial disclosures. *The Journal of Finance*, *69*(4), pp.1643-1671.

Loughran, T. and McDonald, B., 2016. Textual analysis in accounting and finance: A survey. *Journal of Accounting Research*, *54*(4), pp.1187-1230.

Lowry, M., 2009. Discussion of 'Shareholder litigation and changes in disclosure behavior.' *Journal of Accounting and Economics, 47*(1-2), pp.157-159.

Mc Laughlin, G.H., 1969. SMOG grading-a new readability formula. *Journal of Reading*, *12*(8), pp.639-646.

Miller, B.P., 2010. The effects of reporting complexity on small and large investor trading. *The Accounting Review*, *85*(6), pp.2107-2143.

Petersen, M.A., 2009. Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of Financial Studies*, *22*(1), pp.435-480.

Rennekamp, K., 2012. Processing fluency and investors' reactions to disclosure readability. *Journal of Accounting Research*, *50*(5), pp.1319-1354.

Roberts, M.R. and Whited, T.M., 2013. Endogeneity in empirical corporate finance. *Handbook of the Economics of Finance* (Vol. 2, pp. 493-572). Elsevier.

Rogers, J.L., Van Buskirk, A. and Zechman, S.L., 2011. Disclosure tone and shareholder litigation. *The Accounting Review*, *86*(6), pp.2155-2183.

Rosenbaum, P.R. and Rubin, D.B., 1983. The central role of the propensity score in observational studies for causal effects. *Biometrika*, *70*(1), pp.41-55.

Senter, R.J. and Smith, E.A., 1967. Automated readability index. *Cincinnati University, OH.*

Tetlock, P.C., Saar-Tsechansky, M. and Macskassy, S., 2008. More than words: Quantifying language to measure firms' fundamentals. *The Journal of Finance*, *63*(3), pp.1437-1467.

Wilson, B., 2002. Pleading versus proving scienter under the Private Securities Litigation Reform Act of 1995 in the Ninth Circuit after in re Silicon Graphics and Howard v. Everex: Meet the pleading standard and the fat lady has already sung. *Willamette L. Rev.*, *38*, p.321.

Wright, N., 2009. Towards a better readability measure–The Bog index. Retrieved from http://www.clearest.co.uk

Fig. 1. The Ninth Circuit

The map highlights (in yellow) the nine states that belong to The United States Courts for the Ninth Circuit, which includes Alaska (AK), Arizona (AZ), California (CA), Hawaii (HI), Idaho (ID), Montana (MT), Nevada (NV), Oregon (OR), and Washington (WA). The Ninth Circuit ruling In re Silicon Graphics, Inc. in the year 1999 led to an unexpected and sudden reduction in the threat of litigation for firms headquartered in these states.

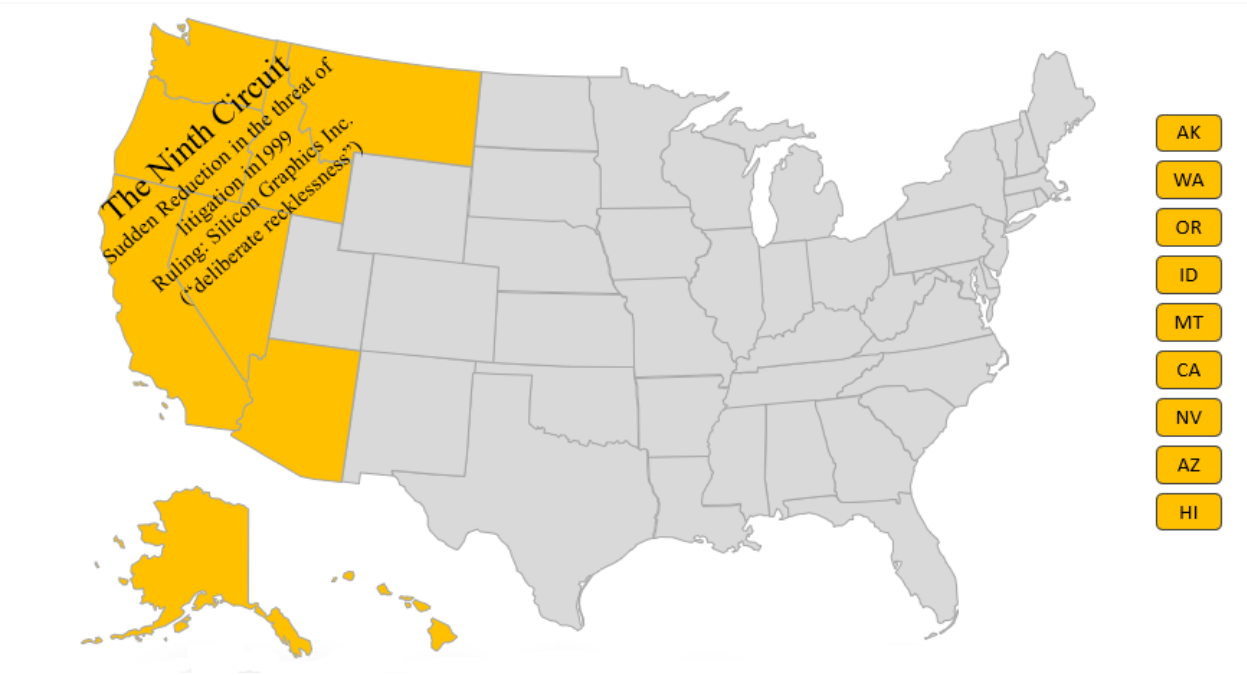

Fig. 2. Border States

The four states highlighted in yellow, the treated group, belong to The United States Courts for the Ninth Circuit. They are Arizona (AZ), Idaho (ID), Montana (MT), and Nevada (NV). The five states highlighted in dark grey, the control group, share a border with the four states in the treated group, but do not belong to The United States Courts for the Ninth Circuit. They are New Mexico (NM), Wyoming (WY), North Dakota (ND), South Dakota (SD), and Utah (UT).

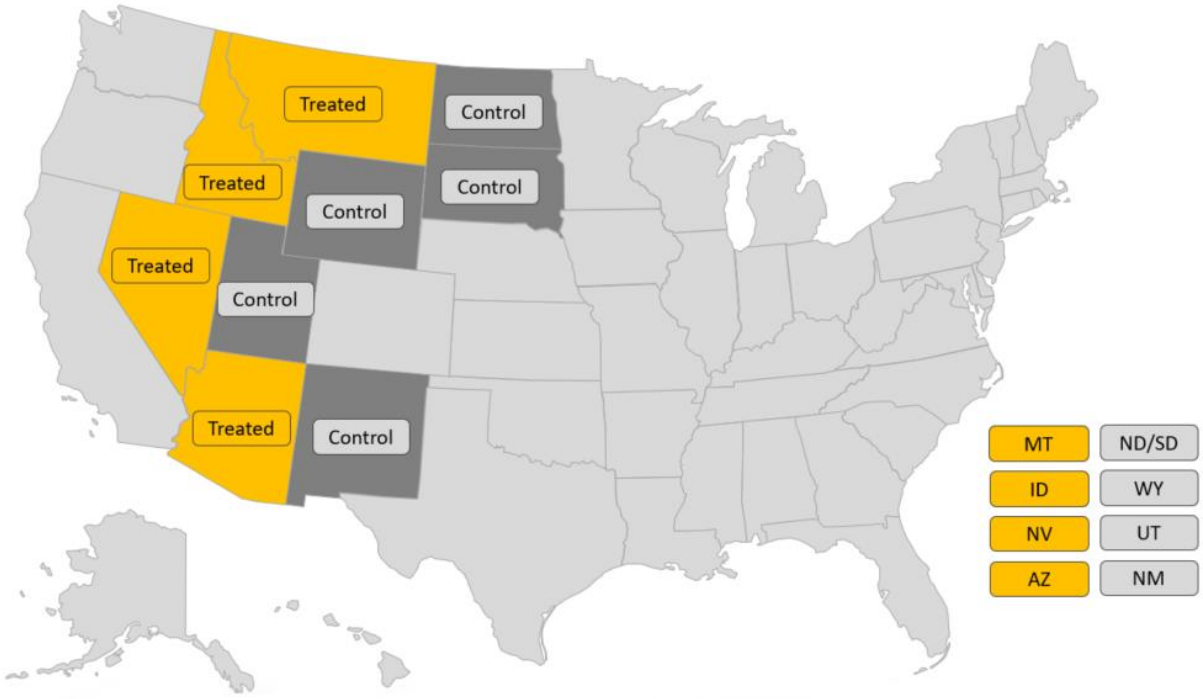

Table 1 Summary Statistics on Readability Measures

The table presents summary statistics for the nine readability measures used in our baseline sample from 1994 to 2014. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Panel A presents results for the full sample. Panel B presents results for firms headquartered in the Ninth Circuit, and hence are subject to the 1999 Ninth Circuit ruling In re Silicon Graphics, Inc. Panel C presents results for firms headquartered outside the Ninth Circuit, and hence are not subject to the 1999 ruling. The unit of observation is firm-year.

	Observations	Mean	Std. dev.	Min.	25th Percentile	Median	75th Percentile	Max.
				Panel A: All Firms				
Automated Readability Index	85,020	22.261	1.347	13.884	21.462	22.124	22.855	45.809
Flesch-Kincaid Readability Index	85,020	15.570	1.144	8.777	14.889	15.548	16.197	27.854
Gunning Fog Readability Index	85,020	19.870	1.177	12.837	19.157	19.834	20.513	32.235
Smog Readability Index	85,020	17.283	0.817	11.158	16.779	17.270	17.759	23.839
Flesch Reading Ease Index	85,020	26.672	4.312	0.016	23.747	26.434	29.359	48.392
Lasbarhets Readability Index	85,020	59.881	2.847	41.927	58.161	59.849	61.522	97.576
RIX Readability Index	85,020	8.628	0.924	2.792	8.063	8.588	9.134	23.803
Coleman-Liau Readability Index	85,020	22.356	0.863	19.258	21.842	22.265	22.749	36.968
Bog Index	85,020	82.366	7.768	47.000	77.000	82.000	87.000	211.000
				Panel B: Firms in Ninth Circuit				
Automated Readability Index	28,791	22.291	1.371	13.884	21.472	22.140	22.886	36.063
Flesch-Kincaid Readability Index	28,791	15.554	1.156	8.777	14.865	15.519	16.162	25.351
Gunning Fog Readability Index	28,791	19.837	1.200	12.837	19.103	19.790	20.474	30.029
Smog Readability Index	28,791	17.257	0.826	11.158	16.743	17.238	17.726	23.119
Flesch Reading Ease Index	28,791	26.671	4.347	0.371	23.734	26.457	29.460	48.392
Lasbarhets Readability Index	28,791	59.901	2.896	41.927	58.131	59.847	61.564	84.130
RIX Readability Index	28,791	8.624	0.934	2.792	8.044	8.578	9.126	17.465
Coleman-Liau Readability Index	28,791	22.431	0.872	19.258	21.890	22.350	22.850	31.542
Bog Index	28,791	82.686	7.776	48.000	78.000	83.000	88.000	127.000
				Panel C: Firms NOT in Ninth Circuit				
Automated Readability Index	56,229	22.245	1.334	15.065	21.457	22.116	22.840	45.809
Flesch-Kincaid Readability Index	56,229	15.578	1.137	9.430	14.901	15.565	16.217	27.854
Gunning Fog Readability Index	56,229	19.887	1.165	13.360	19.183	19.857	20.533	32.235
Smog Readability Index	56,229	17.296	0.812	11.665	16.800	17.287	17.775	23.839
Flesch Reading Ease Index	56,229	26.673	4.294	0.016	23.753	26.421	29.309	47.997
Lasbarhets Readability Index	56,229	59.870	2.821	42.798	58.176	59.849	61.502	97.576
RIX Readability Index	56,229	8.630	0.918	3.383	8.072	8.594	9.137	23.803
Coleman-Liau Readability Index	56,229	22.318	0.855	19.306	21.818	22.227	22.696	36.968
Bog Index	56,229	82.202	7.759	47.000	77.000	82.000	87.000	211.000

Table 2 Correlation of Readability Measures

The table presents the pairwise correlation between the nine readability measures used in our baseline sample from 1994 to 2014. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Results are all significant at 1% level (*p*-values not reported).

	Automated Readability Index	Flesch-Kincaid Readability Index	Gunning Fog Readability Index	Smog Readability Index	Flesch Reading Ease Index	Lasbarhets Readability Index	RIX Readability Index	Coleman-Liau Readability Index	Bog Index
Automated Readability Index	1.0000								
Flesch-Kincaid Readability Index	0.8592	1.0000							
Gunning Fog Readability Index	0.8602	0.9622	1.0000						
Smog Readability Index	0.8460	0.9583	0.9955	1.0000					
Flesch Reading Ease Index	-0.6277	-0.8577	-0.8172	-0.8269	1.0000				
Lasbarhets Readability Index	0.8631	0.9336	0.9258	0.9242	-0.8542	1.0000			
RIX Readability Index	0.8967	0.9623	0.9483	0.9486	-0.8044	0.9825	1.0000		
Coleman-Liau Readability Index	0.3109	-0.0201	0.0324	0.0359	-0.2039	0.1877	0.0841	1.0000	
Bog Index	0.3414	0.5423	0.4847	0.5068	-0.6406	0.5307	0.5106	0.0407	1.0000

Table 3 Summary Statistics on Control Variables

The table presents summary statistics for the control variables used in our baseline sample from 1994 to 2014. *MVE* is the market value of equity (in thousands of dollars). *ROA* is return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is the natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Panel A presents results for the full sample. Panel B presents results for firms headquartered in the Ninth Circuit, and hence are subject to the 1999 Ninth Circuit ruling in In re Silicon Graphics, Inc. Panel C presents results for firms headquartered outside the Ninth Circuit, and hence are not subject to the 1999 ruling. The unit of observation is firm-year.

	Observations	Mean	Median	Std. dev.
		Panel A: All Firms		
Size (Market Value '000)	80,131	2773.293	243.753	14374.780
ROA	80,131	0.029	0.093	7.535
Earnings Growth	80,131	0.005	0.003	1.170
Sales Growth	80,131	0.018	0.011	0.594
Loss Indicator	80,131	0.313	0.000	0.464
Market to Book	80,131	0.034	0.017	1.045
Stock Volatility	80,131	0.502	0.400	0.388
Stock Return	80,131	1.179	1.066	0.900
Big-8 Auditor Indicator	80,131	0.738	1.000	0.440
Institutional Ownership	80,131	0.362	0.298	0.338
		Panel B: Firm in Ninth Circuit		
Size (Market Value '000)	27,490	3513.187	266.320	17937.590
ROA	27,490	0.065	0.105	0.796
Earnings Growth	27,490	0.007	0.004	1.566
Sales Growth	27,490	0.022	0.011	0.895
Loss Indicator	27,490	0.324	0.000	0.468
Market to Book	27,490	0.020	0.017	1.116
Stock Volatility	27,490	0.522	0.427	0.378
Stock Return	27,490	1.207	1.067	0.980
Big-8 Auditor Indicator	27,490	0.817	1.000	0.387
Institutional Ownership	27,490	0.405	0.385	0.338
		Panel C: Firms NOT in Ninth Circuit		
Size (Market Value '000)	52,641	2386.908	233.104	12086.560
ROA	52,641	0.010	0.086	9.279
Earnings Growth	52,641	0.004	0.002	0.895
Sales Growth	52,641	0.017	0.011	0.343
Loss Indicator	52,641	0.307	0.000	0.461
Market to Book	52,641	0.042	0.017	1.005
Stock Volatility	52,641	0.491	0.385	0.393
Stock Return	52,641	1.165	1.066	0.856
Big-8 Auditor Indicator	52,641	0.697	1.000	0.460
Institutional Ownership	52,641	0.339	0.254	0.336

Table 4 Difference-in-Differences Regression: The Effect of Litigation Risk on Readability of Financial Disclosures

The table presents a difference-in-differences estimation of the effect of the 1999 ruling on the readability of firms' 10-K filings with the SEC. Each model estimates the effect on a different readability measure, including the Automated Readability Index, Flesch-Kincaid Readability Index, Gunning Fog Readability Index, Smog Readability Index, Flesch Reading Ease Index, Lasbarhets Readability Index, RIX Readability Index, Coleman-Liau Readability Index, and Bog Index. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Panel A presents estimates including control variables, year fixed effect, and firm fixed effect. Panel B presents the simple difference-in-differences estimates, excluding control variables and fixed effects. The main variable of interest is the interaction term of two indicator variables: *Ninth Circuit* × *Post-1999*. *Ninth Circuit* takes a value of 1 if the firm is headquartered in the Ninth Circuit. *Post-1999* takes a value of 1 if the observation is after 1999. *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *ROA* is return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is the natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels.

	(1) Automated Readability Index	(2) Flesch-Kincaid Readability Index	(3) Gunning Fog Readability Index	(4) Smog Readability Index	(5) Flesch Reading Ease Index	(6) Lasbarhets Readability Index	(7) RIX Readability Index	(8) Coleman-Liau Readability Index	(9) Bog Index
Panel A: Full Sample with Controls and Year/Firm Fixed Effects									
Ninth Circuit x Post 1999	-0.244***	-0.169***	-0.243***	-0.173***	0.747***	-0.612***	-0.175***	-0.157***	-0.930***
	(0.043)	(0.034)	(0.037)	(0.026)	(0.112)	(0.087)	(0.029)	(0.029)	(0.196)
LN (Market Value)	0.014	0.023***	0.006	0.003	-0.252***	0.062***	0.008	0.046***	0.056
	(0.009)	(0.007)	(0.008)	(0.005)	(0.023)	(0.018)	(0.006)	(0.006)	(0.042)
ROA	0.000***	0.000	0.000	0.000	0.001	0.000	0.000	-0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)
Earnings Growth	-0.001	0.001	0.000	0.000	-0.002	-0.000	0.000	-0.002	0.008
	(0.003)	(0.002)	(0.002)	(0.002)	(0.007)	(0.007)	(0.002)	(0.002)	(0.011)
Sales Growth	0.001	-0.001	-0.000	-0.000	-0.004	-0.000	-0.000	0.003	0.003
	(0.003)	(0.002)	(0.003)	(0.002)	(0.009)	(0.005)	(0.002)	(0.002)	(0.021)
Loss Indicator	0.077***	0.089***	0.080***	0.058***	-0.263***	0.214***	0.073***	-0.025***	0.786***
	(0.014)	(0.011)	(0.012)	(0.008)	(0.033)	(0.027)	(0.009)	(0.008)	(0.056)
Market to Book	-0.005	-0.003	-0.002	-0.002	0.009	-0.005	-0.002	-0.001	-0.013
	(0.004)	(0.003)	(0.004)	(0.003)	(0.012)	(0.008)	(0.003)	(0.001)	(0.021)
Volatility	-0.057***	-0.006	-0.022*	-0.013	-0.024	-0.015	-0.007	-0.048***	0.429***
	(0.015)	(0.011)	(0.012)	(0.008)	(0.036)	(0.028)	(0.009)	(0.009)	(0.067)
Stock Return	-0.019***	-0.015***	-0.014***	-0.010***	0.074***	-0.045***	-0.013***	-0.012***	-0.095***
	(0.005)	(0.003)	(0.004)	(0.003)	(0.011)	(0.009)	(0.003)	(0.003)	(0.020)
Big-8 Auditor Indicator	-0.011	0.021	0.024	0.022	-0.204***	0.147***	0.038**	0.005	0.909***
	(0.028)	(0.022)	(0.024)	(0.017)	(0.077)	(0.056)	(0.019)	(0.019)	(0.132)
Institutional Ownership	0.010	0.000	-0.028	-0.017	0.048	-0.072	-0.009	-0.004	-0.197
	(0.035)	(0.027)	(0.030)	(0.021)	(0.088)	(0.071)	(0.023)	(0.021)	(0.157)
Constant	21.791***	14.682***	19.154***	16.752***	31.424***	57.726***	7.994***	22.278***	75.457***
	(0.077)	(0.061)	(0.064)	(0.043)	(0.179)	(0.147)	(0.049)	(0.046)	(0.302)
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	80,131	80,131	80,131	80,131	80,131	80,131	80,131	80,131	80,131
adj. R-sq	0.409	0.531	0.512	0.543	0.725	0.554	0.517	0.481	0.764
Panel B: Full Sample without Controls and Year/Firm Fixed Effects									
Ninth Circuit x Post 1999	-0.237***	-0.308***	-0.336***	-0.243***	1.476***	-0.833***	-0.247***	-0.062***	-1.576***
	(0.035)	(0.029)	(0.031)	(0.022)	(0.107)	(0.075)	(0.024)	(0.023)	(0.195)
Post 1999	0.218***	0.254***	0.227***	0.165***	-1.373***	0.739***	0.205***	0.131***	2.053***
	(0.034)	(0.030)	(0.031)	(0.022)	(0.109)	(0.074)	(0.024)	(0.023)	(0.205)
Ninth Circuit	0.053**	0.626***	0.425***	0.330***	-3.434***	1.262***	0.389***	-0.260***	4.754***
	(0.022)	(0.019)	(0.020)	(0.014)	(0.069)	(0.048)	(0.015)	(0.015)	(0.126)
Constant	22.203***	15.077***	19.547***	17.031***	29.424***	58.860***	8.318***	22.527***	78.393***
	(0.022)	(0.019)	(0.020)	(0.014)	(0.069)	(0.048)	(0.015)	(0.015)	(0.129)
Observations	85,020	85,020	85,020	85,020	85,020	85,020	85,020	85,020	85,020
adj. R-sq	0.002	0.037	0.015	0.019	0.081	0.022	0.020	0.023	0.052

Table 5 Propensity Score–Matched Sample: Covariate Balance

The table presents the mean covariate balance of both the matching variables (Panel A) and outcome (readability) variables (Panel B). Matching is done based on observable firm characteristics in 1998 (one year prior to the 1999 ruling). *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Dividend Payer* is an indicator variable equal to 1 if the firm paid a dividend in the prior year, and 0 otherwise. *ROA* is return on assets, calculated as EBITDA/total assets. *Stock Return* is the natural log of annualized stock return adjusted by inflation. Readability measures are defined in Section 3, Data and Descriptive Statistics, of the paper. *N* is at firm level.

	Treated	N (Firm)	Control	N (Firm)	t-statistics	p-value
			Panel A: Covariate Balance			
LN (Market Value)	4.85	884	4.87	884	0.23	0.82
Market to Book	2.99	884	2.70	884	-0.32	0.75
Dividend Payer Indicator	0.35	884	0.34	884	-0.30	0.76
ROA	0.02	884	0.03	884	0.28	0.78
Stock Return	0.95	884	0.95	884	0.06	0.95
			Panel B: Outcome Variables - Readability (NOT matched)			
Automated Readability Index	22.32	884	22.30	884	-0.40	0.69
Flesch-Kincaid Readability Index	15.33	884	15.23	884	-1.79	0.07
Gunning Fog Readability Index	19.75	884	19.67	884	-1.34	0.18
Smog Readability Index	17.18	884	17.12	884	-1.37	0.17
Flesch Reading Ease Index	27.82	884	28.33	884	2.39	0.02
Lasbarhets Readability Index	59.67	884	59.41	884	-1.80	0.07
RIX Readability Index	8.53	884	8.45	884	-1.69	0.09
Coleman-Liau Readability Index	22.61	884	22.66	884	1.14	0.25
Bog Index	81.28	884	80.29	884	-2.59	0.01

Table 6 Difference-in-Differences Regression on Propensity Score–Matched Sample: The Effect of Litigation Risk on Readability of Financial Disclosures

The table presents a difference-in-differences estimation of the effect of the 1999 ruling on the readability of firms' 10-K filings with the SEC. The regression is estimated on a propensity score–matched sample. Matching is based on pretreatment firm-level characteristics in 1998 such as market value of equity, market-to-book, dividend payer indicator, ROA, stock return, and industry indicator. Each model estimates the effect on a different readability measure, including Automated Readability Index, Flesch-Kincaid Readability Index, Gunning Fog Readability Index, Smog Readability Index, Flesch Reading Ease Index, Lasbarhets Readability Index, RIX Readability Index, Coleman-Liau Readability Index, and Bog Index. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Panel A presents estimates including control variables, year fixed effect, and firm fixed effect. Panel B presents the simple difference-in-differences estimates, excluding control variables and fixed effects. The main variable of interest is the interaction term of two indicator variables: *Ninth Circuit* × *Post-1999*. *Ninth Circuit* takes a value of 1 if the firm is headquartered in the Ninth Circuit. *Post-1999* takes a value of 1 if the observation is after 1999. *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *ROA* is return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is the natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels.

	(1) Automated Readability Index	(2) Flesch-Kincaid Readability Index	(3) Gunning Fog Readability Index	(4) Smog Readability Index	(5) Flesch Reading Ease Index	(6) Lasbarhets Readability Index	(7) RIX Readability Index	(8) Coleman-Liau Readability Index	(9) Bog Index
Panel A: Matched Sample with Controls and Year/Firm Fixed Effects									
Ninth Circuit x Post 1999	-0.143*	-0.094	-0.146**	-0.103**	0.484**	-0.378**	-0.100*	-0.119**	-0.593*
	(0.080)	(0.063)	(0.067)	(0.046)	(0.205)	(0.158)	(0.052)	(0.054)	(0.348)
LN (Market Value)	0.045**	0.040**	0.036**	0.024**	-0.299***	0.090**	0.019	0.058***	0.065
	(0.021)	(0.016)	(0.017)	(0.012)	(0.052)	(0.042)	(0.014)	(0.013)	(0.097)
ROA	-0.001	-0.003***	-0.003***	-0.002***	0.017***	-0.009***	-0.003***	0.001	-0.020***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.005)	(0.001)	(0.000)	(0.001)	(0.005)
Earnings Growth	-0.005	-0.007	-0.010	-0.006	-0.019	-0.016	-0.007	0.017**	0.154**
	(0.011)	(0.011)	(0.010)	(0.007)	(0.058)	(0.029)	(0.008)	(0.008)	(0.062)
Sales Growth	0.002	-0.000	0.002	0.001	-0.008	0.003	0.000	0.006***	-0.022***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.009)	(0.004)	(0.002)	(0.001)	(0.006)
Loss Indicator	0.095***	0.098***	0.098***	0.071***	-0.325***	0.252***	0.084***	-0.003	1.089***
	(0.034)	(0.027)	(0.028)	(0.019)	(0.079)	(0.065)	(0.022)	(0.018)	(0.136)
Market to Book	-0.003	-0.000	0.001	0.001	-0.002	0.002	0.000	-0.002*	0.006
	(0.004)	(0.002)	(0.002)	(0.001)	(0.006)	(0.004)	(0.002)	(0.001)	(0.007)
Volatility	-0.007	0.033	0.031	0.028	-0.110	0.096	0.034	-0.048**	0.547***
	(0.040)	(0.031)	(0.032)	(0.022)	(0.089)	(0.075)	(0.025)	(0.023)	(0.171)
Stock Return	-0.023**	-0.016*	-0.018**	-0.013**	0.070***	-0.039*	-0.012*	-0.015**	-0.046
	(0.011)	(0.008)	(0.009)	(0.006)	(0.025)	(0.021)	(0.007)	(0.007)	(0.043)
Big-8 Auditor Indicator	0.008	0.019	0.023	0.015	-0.216	0.128	0.028	0.034	0.739***
	(0.057)	(0.044)	(0.048)	(0.034)	(0.163)	(0.112)	(0.037)	(0.044)	(0.267)
Institutional Ownership	-0.265**	-0.164**	-0.221**	-0.146**	0.201	-0.457**	-0.155**	-0.011	-0.782*
	(0.103)	(0.082)	(0.087)	(0.059)	(0.245)	(0.202)	(0.067)	(0.062)	(0.433)
Constant	21.563***	14.391***	18.796***	16.517***	32.397***	57.249***	7.833***	22.357***	74.577***
	(0.153)	(0.120)	(0.126)	(0.086)	(0.370)	(0.296)	(0.098)	(0.097)	(0.622)
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	16,401	16,401	16,401	16,401	16,401	16,401	16,401	16,401	16,401
adj. R-sq	0.360	0.471	0.462	0.496	0.687	0.507	0.467	0.444	0.753
Panel B: Matched Sample without Controls and Year/Firm Fixed Effects									
Ninth Circuit x Post 1999	-0.180**	-0.136**	-0.157**	-0.108**	0.621***	-0.483***	-0.131***	-0.108**	-0.690*
	(0.073)	(0.061)	(0.065)	(0.045)	(0.219)	(0.155)	(0.050)	(0.049)	(0.395)
Post 1999	0.085	0.542***	0.372***	0.285***	-2.806***	1.219***	0.371***	-0.232***	4.436***
	(0.052)	(0.042)	(0.045)	(0.031)	(0.152)	(0.109)	(0.035)	(0.035)	(0.275)
Ninth Circuit	0.148**	0.178***	0.173**	0.123***	-0.895***	0.526***	0.147***	0.062	0.924**
	(0.072)	(0.064)	(0.067)	(0.047)	(0.236)	(0.159)	(0.051)	(0.049)	(0.448)
Constant	22.169***	15.013***	19.459***	16.968***	29.439***	58.714***	8.257***	22.629***	78.212***
	(0.051)	(0.044)	(0.046)	(0.032)	(0.163)	(0.111)	(0.035)	(0.035)	(0.309)
Observations	16,674	16,674	16,674	16,674	16,674	16,674	16,674	16,674	16,674
adj. R-sq	0.001	0.032	0.012	0.015	0.064	0.023	0.021	0.020	0.052

Table 7 Difference-in-Differences Regression with Principal Component Analyses (PCA): The Effect of Litigation Risk on Readability of Financial Disclosures

The table presents a difference-in-differences estimation of the effect of the 1999 ruling on the readability of firms' 10-K filings with the SEC. The regression is estimated on the full sample (Model 1), and a propensity score–matched sample (Model 2: matching is based on pretreatment firm-level characteristics in 1998 such as market value, market-to-book, dividend payer indicator, ROA, stock return, and industry indicator). The dependent variable is *Readability Index*, created using principal component analysis (PCA) from the eight readability measures, including Automated Readability Index, Flesch-Kincaid Readability Index, Gunning Fog Readability Index, Smog Readability Index, Lasbarhets Readability Index, RIX Readability Index, Coleman-Liau Readability Index, and Bog Index. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Panel A presents estimates including control variables, year fixed effect, and firm fixed effect. Panel B presents the simple difference-in-differences estimates, excluding control variables and fixed effects. The main variable of interest is the interaction term of two indicator variables: *Ninth Circuit* × *Post-1999*. *Ninth Circuit* takes a value of 1 if the firm is headquartered in the Ninth Circuit. *Post-1999* takes a value of 1 if the observation is after 1999. *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *ROA* is return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels.

DV: Readability (PCA)	(1) Full Sample	(2) Matched Sample
	Panel A: Results with Controls and Year/Firm Fixed Effects	
Ninth Circuit x Post 1999	-0.494***	-0.279**
	(0.075)	(0.130)
LN (Market Value)	0.032**	0.072**
	(0.015)	(0.034)
ROA	0.000	-0.006***
	(0.000)	(0.001)
Earnings Growth	0.000	-0.010
	(0.005)	(0.021)
Sales Growth	-0.000	0.001
	(0.004)	(0.005)
Loss Indicator	0.193***	0.223***
	(0.023)	(0.055)
Market to Book	-0.006	0.000
	(0.007)	(0.004)
Volatility	-0.027	0.074
	(0.025)	(0.063)
Stock Return	-0.036***	-0.035**
	(0.008)	(0.017)
Big-8 Auditor Indicator	0.089*	0.075
	(0.048)	(0.093)
Institutional Ownership	-0.035	-0.413**
	(0.061)	(0.165)
Constant	-1.738***	-2.002***
	(0.129)	(0.244)
Year Fixed Effect	Y	Y
Firm Fixed Effect	Y	Y
Observations	80,131	16,401
adj. R-sq	0.535	0.485
	Panel B: Results without Controls and Year/Firm Fixed Effects	
Ninth Circuit x Post 1999	-0.683***	-0.338***
	(0.064)	(0.126)
Post 1999	0.570***	0.896***
	(0.064)	(0.088)
Ninth Circuit	1.016***	0.373***
	(0.041)	(0.131)
Constant	-0.811***	-0.719***
	(0.041)	(0.090)
Observations	85,020	16,674
adj. R-sq	0.020	0.019

Table 8a Cross-Sectional Analysis: The Differential Effect of Litigation Risk on Readability of Financial Disclosures

The table presents a triple difference estimation of the differential effect of the 1999 ruling on the readability of firms' 10-K filings with the SEC between firms with high versus low exposure of litigation risk. The additional interaction term, dummy "high-risk", indicates firms in industries with high litigation risks (industries with two-digit SIC codes of 73, 28, 36, 35, and 38). Each model estimates the effect on a different readability measure, including Automated Readability Index, Flesch-Kincaid Readability Index, Gunning Fog Readability Index, Smog Readability Index, Flesch Reading Ease Index, Lasbarhets Readability Index, RIX Readability Index, Coleman-Liau Readability Index, and Bog Index. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Panel A presents estimates including control variables, year fixed effect, and firm fixed effect. Panel B presents the simple difference-in-differences estimates, excluding control variables and fixed effects. The main variable of interest is the triple interaction term: *Ninth Circuit* × *Post-1999*. *Ninth Circuit* × *High-Risk*. *Ninth Circuit* takes a value of 1 if the firm is headquartered in the Ninth Circuit. *Post-1999* takes a value of 1 if the observation is after 1999. *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *High-Risk* takes a value of 1 if the firm is in industries with high litigation risk. *ROA* is return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is the natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels.

	(1) Automated Readability Index	(2) Flesch-Kincaid Readability Index	(3) Gunning Fog Readability Index	(4) Smog Readability Index	(5) Flesch Reading Ease Index	(6) Lasbarhets Readability Index	(7) RIX Readability Index	(8) Coleman-Liau Readability Index	(9) Bog Index
				Panel A: Full Sample with Controls and Year/Firm Fixed Effects					
Ninth Circuit x Post 1999 x High-Risk	-0.210**	-0.267***	-0.297***	-0.204***	1.120***	-0.745***	-0.222***	-0.006	-2.000***
	(0.085)	(0.068)	(0.075)	(0.052)	(0.227)	(0.175)	(0.057)	(0.059)	(0.413)
Post 1999	0.782***	1.383***	1.234***	0.919***	-6.244***	3.261***	1.049***	-0.191***	10.056***
	(0.076)	(0.061)	(0.064)	(0.043)	(0.172)	(0.146)	(0.049)	(0.044)	(0.279)
Ninth Circuit x Post 1999	-0.158***	-0.067	-0.124**	-0.092***	0.304**	-0.308***	-0.087**	-0.143***	-0.129
	(0.058)	(0.046)	(0.049)	(0.034)	(0.144)	(0.114)	(0.038)	(0.038)	(0.242)
High-Risk x Post 1999	0.030	0.111**	0.069	0.049	-0.312**	0.106	0.055	-0.119***	0.451
	(0.061)	(0.049)	(0.053)	(0.036)	(0.157)	(0.124)	(0.041)	(0.042)	(0.279)
LN (Market Value)	0.014	0.023***	0.007	0.004	-0.255***	0.064***	0.009	0.046***	0.062
	(0.009)	(0.007)	(0.008)	(0.005)	(0.023)	(0.018)	(0.006)	(0.006)	(0.042)
ROA	0.000***	0.000	0.000	0.000	0.001	0.000	0.000	-0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)
Earnings Growth	-0.001	0.001	0.000	0.000	-0.002	-0.000	0.000	-0.002	0.008
	(0.003)	(0.002)	(0.002)	(0.002)	(0.007)	(0.007)	(0.002)	(0.002)	(0.011)
Sales Growth	0.001	-0.001	-0.000	-0.000	-0.004	-0.000	-0.000	0.004	0.003
	(0.003)	(0.003)	(0.003)	(0.002)	(0.010)	(0.005)	(0.002)	(0.002)	(0.020)
Loss Indicator	0.078***	0.090***	0.081***	0.058***	-0.266***	0.216***	0.074***	-0.024***	0.790***
	(0.014)	(0.011)	(0.012)	(0.008)	(0.033)	(0.027)	(0.009)	(0.008)	(0.056)
Market to Book	-0.005	-0.003	-0.002	-0.001	0.009	-0.005	-0.002	-0.001	-0.013
	(0.004)	(0.003)	(0.004)	(0.003)	(0.012)	(0.008)	(0.003)	(0.001)	(0.021)
Volatility	-0.056***	-0.005	-0.021*	-0.012	-0.027	-0.012	-0.007	-0.047***	0.435***
	(0.015)	(0.011)	(0.012)	(0.008)	(0.036)	(0.028)	(0.009)	(0.009)	(0.068)
Stock Return	-0.019***	-0.015***	-0.014***	-0.010***	0.073***	-0.045***	-0.013***	-0.011***	-0.094***
	(0.005)	(0.003)	(0.004)	(0.003)	(0.011)	(0.009)	(0.003)	(0.003)	(0.020)
Big-8 Auditor Indicator	-0.013	0.021	0.021	0.020	-0.196**	0.137**	0.036*	-0.001	0.890***
	(0.028)	(0.022)	(0.024)	(0.017)	(0.077)	(0.056)	(0.019)	(0.019)	(0.131)
Institutional Ownership	0.010	-0.000	-0.028	-0.017	0.049	-0.072	-0.009	-0.003	-0.197
	(0.035)	(0.027)	(0.030)	(0.021)	(0.088)	(0.071)	(0.023)	(0.021)	(0.157)
Constant	21.794***	14.681***	19.157***	16.754***	31.417***	57.738***	7.996***	22.286***	75.476***
	(0.077)	(0.060)	(0.063)	(0.043)	(0.178)	(0.147)	(0.049)	(0.046)	(0.302)
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	80,131	80,131	80,131	80,131	80,131	80,131	80,131	80,131	80,131
adj. R-sq	0.409	0.532	0.513	0.543	0.726	0.554	0.517	0.482	0.765

	(1) Automated Readability Index	(2) Flesch-Kincaid Readability Index	(3) Gunning Fog Readability Index	(4) Smog Readability Index	(5) Flesch Reading Ease Index	(6) Lasbarhets Readability Index	(7) RIX Readability Index	(8) Coleman-Liau Readability Index	(9) Bog Index
	Panel B: Full Sample without Controls and Year/Firm Fixed Effects								
Ninth Circuit x Post 1999 x High-Risk	-0.156**	-0.253***	-0.272***	-0.190***	1.384***	-0.753***	-0.208***	-0.059	-1.872***
	(0.070)	(0.059)	(0.063)	(0.044)	(0.217)	(0.152)	(0.049)	(0.047)	(0.396)
Ninth Circuit	0.171***	0.151***	0.125***	0.091***	-0.670***	0.416***	0.124***	0.082***	0.658***
	(0.045)	(0.039)	(0.041)	(0.029)	(0.136)	(0.095)	(0.031)	(0.029)	(0.241)
Post 1999	0.031	0.567***	0.402***	0.314***	-3.178***	1.174***	0.358***	-0.234***	4.407***
	(0.028)	(0.024)	(0.025)	(0.017)	(0.083)	(0.059)	(0.019)	(0.018)	(0.146)
Ninth Circuit x Post 1999	-0.180***	-0.222***	-0.236***	-0.174***	0.956***	-0.538***	-0.170***	-0.021	-0.804***
	(0.047)	(0.039)	(0.042)	(0.029)	(0.136)	(0.099)	(0.032)	(0.030)	(0.239)
High-Risk	-0.046	-0.036	-0.129***	-0.089***	-0.873***	0.371***	0.021	0.309***	3.589***
	(0.047)	(0.040)	(0.043)	(0.030)	(0.149)	(0.102)	(0.032)	(0.032)	(0.283)
Ninth Circuit x High-Risk	0.127*	0.263***	0.288***	0.206***	-1.510***	0.702***	0.195***	0.041	2.504***
	(0.068)	(0.060)	(0.063)	(0.044)	(0.222)	(0.150)	(0.048)	(0.046)	(0.418)
High-Risk x Post 1999	0.071	0.178***	0.085**	0.060**	-0.647***	0.212**	0.089***	-0.116***	0.576**
	(0.046)	(0.039)	(0.042)	(0.029)	(0.146)	(0.101)	(0.032)	(0.032)	(0.270)
Constant	22.216***	15.087***	19.585***	17.058***	29.683***	58.750***	8.312***	22.435***	77.329***
	(0.027)	(0.024)	(0.025)	(0.017)	(0.082)	(0.058)	(0.019)	(0.018)	(0.149)
Observations	85,020	85,020	85,020	85,020	85,020	85,020	85,020	85,020	85,020
adj. R-sq	0.002	0.041	0.015	0.019	0.113	0.033	0.024	0.039	0.129

Table 8b Cross-Sectional Analysis: The Differential Effect of Litigation Risk on Readability of Financial Disclosures (Propensity Score Matched Sample)

The table presents a triple difference estimation of the differential effect of the 1999 ruling on the readability of firms' 10-K filings with the SEC between firms with high versus low exposure of litigation risk, using propensity score matched sample. The additional interaction term, dummy "high-risk", indicates firms in industries with high litigation risks (industries with two-digit SIC codes of 73, 28, 36, 35, and 38). Each model estimates the effect on a different readability measure, including Automated Readability Index, Flesch-Kincaid Readability Index, Gunning Fog Readability Index, Smog Readability Index, Flesch Reading Ease Index, Lasbarhets Readability Index, RIX Readability Index, Coleman-Liau Readability Index, and Bog Index. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Panel A presents estimates including control variables, year fixed effect, and firm fixed effect. Panel B presents the simple difference-in-differences estimates, excluding control variables and fixed effects. The main variable of interest is the triple interaction term: *Ninth Circuit* × *Post-1999*. *Ninth Circuit* × *High-Risk*. *Ninth Circuit* takes a value of 1 if the firm is headquartered in the Ninth Circuit. *Post-1999* takes a value of 1 if the observation is after 1999. *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *High-Risk* takes a value of 1 if the firm is in industries with high litigation risk. *ROA* is return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is the natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels.

	(1) Automated Readability Index	(2) Flesch-Kincaid Readability Index	(3) Gunning Fog Readability Index	(4) Smog Readability Index	(5) Flesch Reading Ease Index	(6) Lasbarhets Readability Index	(7) RIX Readability Index	(8) Coleman-Liau Readability Index	(9) Bog Index
					Panel A: Full Sample with Controls and Year/Firm Fixed Effects				
Ninth Circuit x Post 1999 x High-Risk	-0.432***	-0.378***	-0.405***	-0.277***	1.614***	-1.077***	-0.315***	-0.184	-2.252***
	(0.162)	(0.126)	(0.135)	(0.093)	(0.410)	(0.314)	(0.103)	(0.113)	(0.729)
Post 1999	0.774***	1.495***	1.332***	0.972***	-6.547***	3.459***	1.104***	-0.367***	10.821***
	(0.144)	(0.113)	(0.118)	(0.081)	(0.339)	(0.278)	(0.093)	(0.087)	(0.542)
Ninth Circuit x Post 1999	0.013	0.044	0.001	-0.003	-0.102	0.011	0.014	-0.054	0.225
	(0.102)	(0.084)	(0.088)	(0.060)	(0.267)	(0.208)	(0.068)	(0.065)	(0.428)
High-Risk x Post 1999	0.114	0.144	0.111	0.078	-0.502*	0.205	0.086	-0.030	0.759
	(0.118)	(0.090)	(0.096)	(0.065)	(0.281)	(0.223)	(0.073)	(0.081)	(0.488)
LN (Market Value)	0.047**	0.043***	0.039**	0.025**	-0.309***	0.097**	0.021	0.059***	0.079
	(0.022)	(0.016)	(0.018)	(0.012)	(0.052)	(0.042)	(0.014)	(0.013)	(0.096)
ROA	-0.001	-0.003***	-0.002***	-0.002***	0.016***	-0.008***	-0.002***	0.001	-0.019***
	(0.001)	(0.001)	(0.001)	(0.000)	(0.006)	(0.002)	(0.000)	(0.001)	(0.005)
Earnings Growth	-0.006	-0.008	-0.010	-0.006	-0.018	-0.017	-0.008	0.016**	0.153**
	(0.011)	(0.011)	(0.009)	(0.006)	(0.056)	(0.028)	(0.008)	(0.008)	(0.061)
Sales Growth	0.002	0.000	0.002	0.001	-0.008	0.003	0.000	0.006***	-0.021***
	(0.003)	(0.003)	(0.003)	(0.002)	(0.010)	(0.005)	(0.002)	(0.001)	(0.007)
Loss Indicator	0.095***	0.099***	0.098***	0.071***	-0.328***	0.253***	0.084***	-0.003	1.092***
	(0.034)	(0.027)	(0.028)	(0.019)	(0.079)	(0.065)	(0.022)	(0.018)	(0.136)
Market to Book	-0.003	-0.000	0.001	0.001	-0.002	0.002	0.000	-0.002*	0.006
	(0.004)	(0.002)	(0.002)	(0.001)	(0.006)	(0.004)	(0.002)	(0.001)	(0.006)
Volatility	-0.004	0.035	0.034	0.030	-0.120	0.104	0.036	-0.046**	0.561***
	(0.040)	(0.030)	(0.032)	(0.022)	(0.089)	(0.074)	(0.025)	(0.023)	(0.172)
Stock Return	-0.024**	-0.016*	-0.018**	-0.013**	0.070***	-0.039*	-0.012*	-0.015**	-0.047
	(0.011)	(0.008)	(0.009)	(0.006)	(0.025)	(0.021)	(0.007)	(0.007)	(0.043)
Big-8 Auditor Indicator	0.002	0.016	0.017	0.011	-0.197	0.108	0.024	0.027	0.715***
	(0.057)	(0.043)	(0.048)	(0.034)	(0.163)	(0.112)	(0.036)	(0.044)	(0.266)
Institutional Ownership	-0.262**	-0.162**	-0.218**	-0.144**	0.191	-0.448**	-0.153**	-0.009	-0.769*
	(0.103)	(0.082)	(0.086)	(0.059)	(0.244)	(0.202)	(0.067)	(0.062)	(0.435)
Constant	21.558***	14.385***	18.791***	16.514***	32.419***	57.240***	7.829***	22.358***	74.544***
	(0.153)	(0.120)	(0.127)	(0.086)	(0.370)	(0.296)	(0.098)	(0.097)	(0.622)
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	16,401	16,401	16,401	16,401	16,401	16,401	16,401	16,401	16,401
adj. R-sq	0.361	0.472	0.463	0.497	0.689	0.509	0.468	0.445	0.754

	(1) Automated Readability Index	(2) Flesch-Kincaid Readability Index	(3) Gunning Fog Readability Index	(4) Smog Readability Index	(5) Flesch Reading Ease Index	(6) Lasbarhets Readability Index	(7) RIX Readability Index	(8) Coleman-Liau Readability Index	(9) Bog Index
	Panel B: Full Sample without Controls and Year/Firm Fixed Effects								
Ninth Circuit x Post 1999 x High-Risk	-0.454***	-0.425***	-0.534***	-0.371***	1.928***	-1.252***	-0.364***	-0.207**	-3.014***
	(0.147)	(0.120)	(0.129)	(0.090)	(0.437)	(0.310)	(0.100)	(0.100)	(0.800)
Ninth Circuit	0.043	0.030	0.023	0.016	-0.125	0.125	0.031	0.023	-0.044
	(0.092)	(0.081)	(0.086)	(0.060)	(0.293)	(0.201)	(0.064)	(0.060)	(0.526)
Post 1999	0.039	0.482***	0.320***	0.249***	-2.610***	1.146***	0.339***	-0.213***	4.112***
	(0.067)	(0.056)	(0.059)	(0.041)	(0.200)	(0.143)	(0.046)	(0.043)	(0.343)
Ninth Circuit x Post 1999	-0.018	0.014	0.034	0.025	-0.045	-0.047	-0.003	-0.039	0.324
	(0.095)	(0.080)	(0.085)	(0.059)	(0.283)	(0.201)	(0.064)	(0.061)	(0.490)
High-Risk	0.032	-0.015	-0.062	-0.044	-0.617*	0.411*	0.050	0.273***	3.243***
	(0.106)	(0.090)	(0.095)	(0.066)	(0.333)	(0.227)	(0.072)	(0.071)	(0.637)
Ninth Circuit x High-Risk	0.301**	0.419***	0.421***	0.302***	-2.232***	1.169***	0.334***	0.131	2.960***
	(0.147)	(0.129)	(0.136)	(0.095)	(0.478)	(0.321)	(0.103)	(0.099)	(0.925)
High-Risk x Post 1999	0.124	0.161*	0.141	0.097	-0.526*	0.195	0.085	-0.051	0.866
	(0.106)	(0.083)	(0.089)	(0.062)	(0.300)	(0.217)	(0.070)	(0.073)	(0.551)
Constant	22.158***	15.018***	19.482***	16.985***	29.670***	58.561***	8.239***	22.527***	77.001***
	(0.065)	(0.056)	(0.059)	(0.041)	(0.208)	(0.141)	(0.045)	(0.044)	(0.377)
Observations	16,674	16,674	16,674	16,674	16,674	16,674	16,674	16,674	16,674
adj. R-sq	0.003	0.037	0.015	0.018	0.092	0.038	0.028	0.036	0.120

Table 9 Difference-in-Differences Regression on 1996 to 2002 Subsample: The Effect of Litigation Risk on Readability of Financial Disclosures

The table presents a difference-in-differences estimation of the effect of the 1999 ruling on the readability of firms' 10-K filings with the SEC. The regression is estimated on a subset of our baseline sample (from 1996 to 2002) three years prior to 1999 and three years after 1999. Each model estimates the effect on a different readability measure, including Automated Readability Index, Flesch-Kincaid Readability Index, Gunning Fog Readability Index, Smog Readability Index, Flesch Reading Ease Index, Lasbarhets Readability Index, RIX Readability Index, Coleman-Liau Readability Index, and Bog Index. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Panel A presents estimates including control variables, year fixed effect, and firm fixed effect. Panel B presents the simple difference-in-differences estimates, excluding control variables and fixed effects. The main variable of interest is the interaction term of two indicator variables: *Ninth Circuit* × *Post-1999*. *Ninth Circuit* takes a value of 1 if the firm is headquartered in the Ninth Circuit. *Post-1999* takes a value of 1 if the observation is after 1999. *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *ROA* is return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is the natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels.

	(1) Automated Readability Index	(2) Flesch-Kincaid Readability Index	(3) Gunning Fog Readability Index	(4) Smog Readability Index	(5) Flesch Reading Ease Index	(6) Lasbarhets Readability Index	(7) RIX Readability Index	(8) Coleman-Liau Readability Index	(9) Bog Index
Panel A: Full Sample with Controls and Year/Firm Fixed Effects									
Ninth Circuit x Post 1999	-0.319***	-0.197***	-0.264***	-0.189***	0.722***	-0.648***	-0.198***	-0.178***	-0.654***
	(0.050)	(0.037)	(0.040)	(0.027)	(0.113)	(0.093)	(0.031)	(0.032)	(0.185)
LN (Market Value)	-0.016	-0.004	-0.024	-0.016*	-0.143***	-0.016	-0.014	0.035***	-0.043
	(0.018)	(0.014)	(0.015)	(0.009)	(0.039)	(0.035)	(0.011)	(0.010)	(0.071)
ROA	-0.001	-0.002	-0.004	-0.003	0.017	-0.006	-0.001	-0.001	-0.004
	(0.003)	(0.003)	(0.004)	(0.003)	(0.013)	(0.009)	(0.003)	(0.002)	(0.018)
Earnings Growth	0.003	0.003	0.004	0.002	-0.000	0.006	0.003	-0.003	-0.032*
	(0.005)	(0.004)	(0.004)	(0.003)	(0.012)	(0.013)	(0.004)	(0.002)	(0.018)
Sales Growth	-0.001	-0.006**	-0.002	-0.002	0.010	-0.002	-0.003	0.010***	-0.017
	(0.002)	(0.002)	(0.003)	(0.002)	(0.016)	(0.008)	(0.002)	(0.002)	(0.024)
Loss Indicator	0.048*	0.062***	0.052**	0.038**	-0.120*	0.136**	0.052***	-0.045***	0.609***
	(0.029)	(0.023)	(0.024)	(0.016)	(0.065)	(0.055)	(0.018)	(0.017)	(0.096)
Market to Book	-0.013	-0.006	-0.006	-0.004	0.014	-0.019	-0.006	-0.006	-0.012
	(0.008)	(0.004)	(0.004)	(0.003)	(0.014)	(0.013)	(0.004)	(0.005)	(0.029)
Volatility	-0.056**	-0.035*	-0.058***	-0.038***	0.187***	-0.147***	-0.037**	-0.048***	-0.232**
	(0.025)	(0.018)	(0.019)	(0.013)	(0.056)	(0.045)	(0.015)	(0.016)	(0.101)
Stock Return	-0.017**	-0.011**	-0.012*	-0.009**	0.051***	-0.038***	-0.012**	-0.012***	-0.078***
	(0.007)	(0.005)	(0.006)	(0.004)	(0.017)	(0.014)	(0.005)	(0.004)	(0.030)
Big-8 Auditor Indicator	0.041	0.051	0.047	0.037	-0.291*	0.178	0.050	0.029	0.697***
	(0.062)	(0.050)	(0.053)	(0.036)	(0.157)	(0.121)	(0.040)	(0.040)	(0.268)
Institutional Ownership	-0.163	-0.089	-0.170**	-0.117**	0.184	-0.358*	-0.107*	-0.057	-0.746**
	(0.101)	(0.077)	(0.082)	(0.055)	(0.225)	(0.190)	(0.063)	(0.063)	(0.332)
Constant	22.195***	15.064***	19.635***	17.087***	29.782***	58.936***	8.350***	22.428***	78.550***
	(0.097)	(0.077)	(0.080)	(0.052)	(0.222)	(0.188)	(0.061)	(0.057)	(0.387)
Year Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Firm Fixed Effect	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	31,612	31,612	31,612	31,612	31,612	31,612	31,612	31,612	31,612
adj. R-sq	0.453	0.513	0.527	0.561	0.708	0.561	0.526	0.498	0.784
Panel B: Full Sample without Controls and Year/Firm Fixed Effects									
Ninth Circuit x Post 1999	-0.246***	-0.217***	-0.248***	-0.179***	1.076***	-0.696***	-0.196***	-0.156***	-0.564***
	(0.038)	(0.030)	(0.032)	(0.022)	(0.103)	(0.075)	(0.024)	(0.025)	(0.180)
Post 1999	0.006	0.164***	0.041*	0.036**	-1.297***	0.355***	0.080***	0.050***	0.885***
	(0.026)	(0.020)	(0.021)	(0.015)	(0.069)	(0.050)	(0.016)	(0.017)	(0.120)
Ninth Circuit	0.227***	0.272***	0.244***	0.178***	-1.492***	0.800***	0.221***	0.140***	2.232***
	(0.034)	(0.030)	(0.031)	(0.022)	(0.111)	(0.074)	(0.024)	(0.023)	(0.206)
Constant	22.194***	15.066***	19.542***	17.029***	29.383***	58.878***	8.317***	22.555***	78.515***
	(0.023)	(0.020)	(0.021)	(0.015)	(0.071)	(0.049)	(0.016)	(0.015)	(0.131)
Observations	31,612	31,612	31,612	31,612	31,612	31,612	31,612	31,612	31,612
adj. R-sq	0.004	0.006	0.005	0.005	0.022	0.008	0.006	0.002	0.015

Table 10 Difference-in-Differences Regression on Border States (with multidimensional fixed effects): The Effect of Litigation Risk on Readability of Financial Disclosures

The table presents a difference-in-differences estimation of the effect of the 1999 ruling on the readability of firms' 10-K filings with the SEC. The regression is estimated using only firms in states on the border of the Ninth Circuit. These include treated firms in Arizona (AZ), Idaho (ID), Montana (MT), and Nevada (NV) within the Ninth Circuit, and control firms in New Mexico (NM), Wyoming (WY), North Dakota (ND), South Dakota (SD), and Utah (UT) outside the Ninth Circuit. For brevity, we report results on one readability measure, the Bog Index. The variable is defined in Section 3, Data and Descriptive Statistics, of the paper. We add Industry-by-Year fixed effect in Model 1, and both Industry-by-Year and State-by-Year fixed effect in Model 2. The main variable of interest is the interaction term of two indicator variables: *Ninth Circuit* × *Post-1999*. *Ninth Circuit* takes a value of 1 if the firm is headquartered in the Ninth Circuit. *Post-1999* takes a value of 1 if the observation is after 1999. *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *ROA* is return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is the natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels.

	(1) Bog Index	(2) Bog Index
	Subsample (Border States Only)	
Ninth Circuit x Post 1999	-3.114***	-2.194*
	(1.090)	(1.130)
LN (Market Value)	-0.269	-0.309
	(0.241)	(0.247)
ROA	0.062**	0.063*
	(0.026)	(0.035)
Earnings Growth	-0.240	-0.232
	(0.173)	(0.194)
Sales Growth	0.142***	0.139***
	(0.035)	(0.037)
Loss Indicator	0.729**	0.589
	(0.365)	(0.373)
Market to Book	-1.302***	-1.469**
	(0.462)	(0.587)
Volatility	0.464	0.370
	(0.446)	(0.455)
Stock Return	-0.089	-0.093
	(0.123)	(0.119)
Big-8 Auditor Indicator	0.286	0.060
	(0.567)	(0.619)
Institutional Ownership	-0.185	0.052
	(1.096)	(1.117)
Constant	84.535***	84.600***
	(1.297)	(1.412)
Year Fixed Effect	Y	Y
Firm Fixed Effect	Y	Y
Industry x Year Fixed Effect	Y	Y
State x Year Fixed Effect	N	Y
Observations	2,529	2,510
adj. R-sq	0.735	0.741

Table 11 Difference-in-Differences Regression (Evidence from Another Legal Event): The Effect of Litigation Risk on Readability of Financial Disclosures

The table presents a difference-in-differences estimation of the effect of the 2001 Nevada corporate law change on the readability of firms' 10-K filings with the SEC. The regression is estimated on the full sample (Model 1), and a propensity score–matched sample (Model 2: matching is based on pretreatment firm-level characteristics in 2000 such as market value, market-to-book, dividend payer indicator, ROA, stock return, and industry indicator). The dependent variable is *Readability Index*, created using principal component analysis (PCA) from the eight readability measures, including Automated Readability Index, Flesch-Kincaid Readability Index, Gunning Fog Readability Index, Smog Readability Index, Lasbarhets Readability Index, RIX Readability Index, Coleman-Liau Readability Index, and Bog Index. These variables are defined in Section 3, Data and Descriptive Statistics, of the paper. Panel A presents estimates including control variables, year fixed effect, and firm fixed effect. Panel B presents the simple difference-in-differences estimates, excluding control variables and fixed effects. The main variable of interest is the interaction term of two indicator variables: *Nevada* × *Post-2001*. *Nevada* takes a value of 1 if the firm is incorporated in Nevada. *Post-2001* takes a value of 1 if the observation is after 2001. *LN(MVE)* is the natural log of the market value of equity (in thousands of dollars). *ROA* is the return on assets, calculated as EBITDA/total assets. *Earnings Growth* is the change in net income divided by the total assets. *Sales Growth* is the change in sales divided by the total assets. The *Loss* indicator equals 1 if the net income is negative, and 0 otherwise. *Market to Book* is calculated as (book value of debt + market value of equity) / (book value of debt + book value of equity). *Stock Volatility* is the standard deviation of daily stock returns, measured over a 365-day period. *Stock Return* is the natural log of annualized stock return adjusted by inflation. The *Big-8 Auditor* indicator equals 1 if the auditor codes are between 1 and 8, and 0 otherwise. *Institutional Ownership* is the total institutional ownership as a percentage of shares outstanding. Standard errors are clustered at the firm level and reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10% levels.

DV: Readability (PCA)	(1) Full Sample	(2) Matched Sample
Panel A: Results with Controls and Year/Firm Fixed Effects		
Nevada x Post 2001	-0.454**	-0.409**
	(0.193)	(0.206)
LN (Market Value)	0.041**	0.024
	(0.016)	(0.041)
ROA	0.000	0.002
	(0.000)	(0.035)
Earnings Growth	-0.001	0.003
	(0.006)	(0.013)
Sales Growth	-0.003	-0.011***
	(0.006)	(0.004)
Loss Indicator	0.194***	0.246***
	(0.024)	(0.068)
Market to Book	-0.006	-0.025
	(0.009)	(0.084)
Volatility	0.014	0.118
	(0.025)	(0.074)
Stock Return	-0.053***	-0.039*
	(0.008)	(0.023)
Big-8 Auditor Indicator	0.110**	0.141
	(0.050)	(0.137)
Institutional Ownership	-0.070	-0.257
	(0.061)	(0.193)
Constant	-1.698***	-1.955***
	(0.130)	(0.337)
Year Fixed Effect	Y	Y
Firm Fixed Effect	Y	Y
Observations	80,541	9,979
adj. R-sq	0.534	0.515
Panel B: Results without Controls and Year/Firm Fixed Effects		
Nevada x Post 2001	-0.487***	-0.359*
	(0.169)	(0.194)
Post 2001	0.885***	0.910***
	(0.030)	(0.089)
Nevada	0.174	0.267
	(0.176)	(0.219)
Constant	-0.554***	-0.591***
	(0.029)	(0.091)
Observations	80,541	10,176
adj. R-sq	0.030	0.028