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Carrot or Stick? The Shift from Voluntary to Mandatory Disclosure of Risk Factors

*Karen K. Nelson and A. C. Pritchard**

This study investigates risk factor disclosures, examining both the voluntary, incentive-based disclosure regime provided by the safe harbor provision of the Private Securities Litigation Reform Act as well as the SEC's subsequent mandate of these disclosures. Firms subject to greater litigation risk disclose more risk factors, update the language more from year to year, and use more readable language than firms with lower litigation risk. These differences in the quality of disclosure are pronounced in the voluntary disclosure regime, but converge following the SEC mandate as low-risk firms improved the quality of their risk factor disclosures. Consistent with these findings, the risk factor disclosures of high-litigation-risk firms are significantly more informative about systematic and idiosyncratic firm risk when disclosure is voluntary but not when disclosure is mandatory. Overall, the results suggest that for some firms voluntary disclosure of risk factors is not a substitute for a regulatory mandate.

I. INTRODUCTION

Theories of voluntary disclosure suggest that managers generally are eager to share their firms' positive outlook, but may be less forthcoming with bad news. Empirical evidence supports this proposition; for example, Kothari et al. (2009) find that managers delay the release of bad news to investors. What about the *potential* for bad news? Investors assessing the value of a firm's securities are interested in the likelihood of both good and bad outcomes in forecasting the firm's future cash flows. In the extreme, positive projections could be rendered misleading by the omission of potential risks that might thwart the firm's plans and aspirations.

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This article examines public companies' disclosure of risk factors meant to inform investors about risks and uncertainties. In 1995, Congress created a legal incentive to disclose risk factors as part of the Private Securities Litigation Reform Act (PSLRA). The PSLRA's safe harbor provision shields firms from liability for forward-looking statements provided they are accompanied by "meaningful cautionary statements identifying important factors that could cause actual results to differ materially from those in the forward looking statement." The voluntary disclosure of risk factors provides a direct means for firms to reduce the often substantial expected costs of securities fraud class actions. Thus, the safe harbor provides an important incentive for public companies to disclose risk factors. That incentive is likely to vary, however, with firms' perception of their potential vulnerability to securities class actions.

Risk factor disclosure shifted from a voluntary, incentive-based regime to a mandatory regime in 2005 when the Securities and Exchange Commission (SEC) added Item 1A to Form 10-K, requiring most public companies to disclose risk factors annually and update them quarterly as necessary in Form 10-Q. In adopting the new rule, the SEC acknowledged that some issuers had already been disclosing risk factors to take advantage of the PSLRA's safe harbor.

We study how these two changes in the law affect the disclosure of risk factors. We conjecture that litigation risk plays an important role in firms' disclosure practices, particularly during the voluntary disclosure period from 1996 to 2005. Further, we expect that the SEC's 2005 disclosure mandate will narrow, but not necessarily close, the gap between firms with a litigation-related incentive to provide risk factor disclosure and those compelled to disclose because of the mandate; the latter are likely to improve their risk factor disclosure in response to the mandate. Finally, we expect that differences in the quality of the disclosure are likely to affect its usefulness to investors in assessing firm risk.

To conduct our analyses, we construct a sample of firms with high ex-ante risk of being sued in a securities fraud class action and a sample with low ex-ante risk of being sued. We examine risk factors disclosed by these firms in annual reports filed with the SEC from 1996–2010 using three metrics designed to capture characteristics of "meaningful" disclosure suggested by the PSLRA's legislative history, subsequent court decisions, and the SEC: (1) the amount of risk factor disclosure, measured by the number of words; (2) the extent to which the risk factors are updated year to year, measured with the Resemblance score of text similarity; and (3) the readability of the risk factors, measured using the Fog index of text complexity. All else equal, the law considers risk factor disclosure to be more "meaningful" if it is comprehensive, if it is not a boilerplate copy from the prior year, and if it can be understood by the average investor.

We use these disclosure metrics to investigate whether firms at greater risk of securities fraud lawsuits provide more "meaningful" risk factor disclosure, and how the SEC's 2005 mandate affects this disclosure. Controlling for other factors that could affect the disclosure decision, we find that, on average, firms with greater litigation risk provide more risk factor disclosure, revise their disclosure more from year to year, and use more readable language than firms with low litigation risk. When we allow these effects to vary with the disclosure regime, we find significant differences in disclosure between high- and low-risk firms in the voluntary regime. After the SEC mandate in 2005, however, firms with low litigation risk increase the amount of risk factor disclosure, revise it more extensively each year, and use more readable language, thus leading to more similar disclosure across the two groups of firms.

Our conclusion is that the SEC's mandate had a material effect on the disclosure decisions of companies that had less incentive to provide meaningful disclosure under the PSLRA's safe harbor provision alone. This is not to say, however, that litigation-related disclosure incentives have no role to play in the mandatory disclosure regime. We find that firms with high litigation risk continue to provide significantly more risk factor disclosure in the mandatory regime.

Finally, we show that risk factor disclosures provide information useful to investors in assessing future firm risk, although here again the findings vary predictably with firms' disclosure incentives and the disclosure regime. For firms with high litigation risk and hence greater incentive to provide meaningful disclosure, one-year-ahead beta and stock return volatility are increasing in the unexpected portion of risk factor disclosure. Moreover, in the voluntary disclosure regime, firms with high litigation risk provide risk factor disclosures that are significantly more informative about systematic and idiosyncratic risk than firms with low litigation risk. Subsequent to the SEC mandate, however, there is no statistical difference, consistent with low-risk firms converging toward high-risk firms in terms of how meaningful their risk factor disclosures are to investors.

Overall, our findings are consistent with managers responding to high ex-ante litigation risk with risk factor disclosures designed to reduce the expected costs of litigation. In contrast, low-risk firms perceiving little net benefit to disclosure did not provide meaningful risk factor disclosure until compelled to do so by the SEC. Understanding risk factor disclosures is important to managers and legal counsel responsible for formulating a disclosure strategy, to regulators and courts charged with evaluating the quality of these disclosures, and to investors interested in assessing the risks posed by firms.

We proceed as follows. Section II provides institutional background on the evolution of risk factor disclosures in regulatory filings. Section III surveys related research and highlights our contribution. Section IV develops our hypotheses. Section V describes our research design, and Section VI presents the results of our empirical tests. Section VII concludes.

II. EVOLUTION OF RISK FACTOR DISCLOSURES

For many years, risk factors were disclosed primarily by domestic companies registering public offerings on Form S-1 and foreign private issuers on Form 20-F annual reports. Over the past two decades, two regulatory changes progressively broadened the set of firms disclosing risk factors. The first, the enactment of the PSLRA in December 1995, provided an incentive to voluntarily disclose risk factors for firms wishing to avail themselves of its statutory safe harbor for forward-looking statements.¹ Ten years later in December 2005, the SEC approved a rule mandating disclosure of risk factors in periodic filings. This section discusses the regulatory background and requirements of these two rule changes affecting risk factor disclosures.

¹Although the SEC adopted a limited safe harbor for forward-looking disclosures in 1979, Securities Act Rule 175, its reach is narrow, providing very limited protection against liability.

A. PSLRA Safe Harbor and the Voluntary Disclosure of Risk Factors

In enacting the PSLRA, Congress expressed concern that securities class actions were discouraging managers from providing forward-looking information to investors. The PSLRA addresses that issue by creating a statutory safe harbor protecting statements that are identified as forward looking and “accompanied by meaningful cautionary statements identifying important factors that could cause actual results to differ materially from those in the forward looking statement.”² The phrase “accompanied by” has been interpreted loosely by the courts, allowing firms to invoke the safe harbor by including language regarding risk factors in their periodic filings with the SEC and incorporating that disclosure by reference in subsequent communications containing forward-looking statements.³

Although the statute does not explicitly define what constitutes a “meaningful” cautionary statement, legislative history and court decisions provide some insights. In particular, the Conference Report (1995) states that “cautionary statements must convey substantive information about factors that realistically could cause results to differ materially from those projected in the forward-looking statements.” Thus, courts have concluded that a “cursory” discussion of risk factors will not invoke the protections of the safe harbor.⁴

The Conference Report (1995) also states that “boilerplate warnings will not suffice.” For the discussion of risk factors to be meaningful, it must change as the firm’s circumstances change. Accordingly, courts have ruled that when a firm’s “cautionary language remained fixed even as the risks changed,” it was insufficient to warrant the protection of the safe harbor.⁵ Finally, courts have ruled that cautionary risk factor statements will not satisfy the safe harbor’s requirements if they are “too cryptic to be meaningful to the average investor.”⁶ Taken together, the prescriptions found in the PSLRA’s legislative history and court decisions suggest that cautionary statements regarding risk factors should be thorough, should not cut and paste boilerplate language from the preceding year, and should be written in language easily understood by the average investor.

B. SEC Risk Factor Disclosure Mandate

In 2005, the SEC streamlined the public offering process under the Securities Act of 1933 (SEC 2005). In addition to these changes, the SEC also imposed a new disclosure

²See Johnson et al. (2000, 2001) for additional discussion of the PSLRA’s legislative history and the safe harbor.

³For example, firms will often refer to the risk factors discussed in their securities filings in their corporate press releases or investor conference calls.

⁴See, for example, *Helwig v. Vencor, Inc.*, 251 F.3d 540, 559 (6th Cir. 2001); *Yanek v. Staar Surgical Co.*, 388 F.Supp.2d 1110, 1123 (C.D. Cal. 2005). The statute does not, however, require a firm to disclose *all* risk factors that could cause future results to differ from those projected, or *the* particular risk factor that ultimately causes the forward-looking statement to be in error. See Conference Report (1995) and *Harris v. IVAX, Corp.*, 182 F.3d 799, 807 (11th Cir. 1999).

⁵*Asher v. Baxter Int’l, Inc.*, 377 F.3d 727 (7th Cir. 2004).

⁶In re Nike, Inc. Sec. Litig., 181 F.Supp.2d 1160, 1172 (D. Or. 2002).

requirement on public companies pursuant to the Exchange Act. Most public companies must now disclose the most significant factors that may adversely affect the issuer's business, operations, industry, financial position, or its future financial performance. The risk factors are required to be presented in Item 1A of Form 10-K and must be updated quarterly in the 10-Q to reflect material changes from previously disclosed risks.⁷

The SEC rule does not mandate disclosures of particular risks. Instead, it notes that disclosures should be clearly written in everyday language investors can read and understand, in accordance with the SEC's plain English standards (SEC 1999), and should go beyond "boilerplate" discussion of risks that could affect any issuer. Consistent with these prescriptions, the SEC has called on companies to provide more information on the risks they face and to avoid "copying and pasting" from earlier filings (Johnson 2010). Thus, as under the PSLRA, risk factor disclosures should be thorough, updated year to year, and readable. In our research design, discussed below, we develop measures to capture these three facets of risk factor disclosures.

III. RELATED RESEARCH

This article contributes to our understanding of how law and regulation shape managers' response to disclosure incentives and mandates. In particular, we contribute to three interrelated streams of literature regarding: (1) voluntary versus mandatory disclosure; (2) disclosures relating to risk; and (3) the link between disclosure and litigation risk.

A. *Voluntary Versus Mandatory Disclosure*

The earliest work on disclosure regulation examines the market reaction to the passage of the Securities Act of 1933, which allows the SEC to mandate disclosure in public offerings. Stigler (1964) and Jarrell (1981) find no evidence that securities offered after the Securities Act provide investors with greater returns, although postlegislation offerings demonstrate less variance. This latter result may be evidence that investors are better able to assess risk with mandatory disclosure, or it may simply reflect riskier offerings moving to private placements (Benston 1969; Jarrell 1981; Simon 1989).

Other work examines the effects of amendments to the Exchange Act in 1964 that extended mandatory disclosure requirements to firms trading in the over-the-counter market. Ferrell (2007) finds that over-the-counter firms have a significant reduction in volatility after the amendments. Greenstone et al. (2006) show positive abnormal stock returns and an increase in operating performance when the disclosure regime was extended to these firms.

In a related vein, Bushee and Leuz (2005) find that the extension of the Exchange Act disclosure requirements to the OTC-Bulletin Board in 1999 results in positive abnormal

⁷Smaller reporting companies and asset-backed issuers are excluded from the disclosure requirement. At the time the SEC implemented securities offering reform, small public companies were allowed to follow the reduced disclosure requirements of Regulation S-B. The Smaller Reporting Company Rule, adopted by the SEC effective Feb. 4, 2008, consolidated Regulation S-B into Regulation S-K and effectively expanded the number of smaller companies eligible to follow the reduced disclosure requirements. Firms identifying themselves as "smaller reporting companies" may adopt reduced disclosure requirements on an item-by-item basis, including the option to forego Item 1A risk factor disclosures.

returns for OTC-BB firms already subject to the disclosure requirements, suggesting externality effects from disclosure. However, they also find that the imposition of SEC disclosure requirements pushed a large number of firms into the less regulated Pink Sheets. Moreover, the OTC firms that chose to comply with the new disclosure requirements to continue trading on the OTC-BB experienced, on average, negative abnormal returns.

Although most research examines the imposition of mandatory disclosure requirements, Cheng et al. (2013) examine the SEC's 2008 decision to exempt companies under \$75 million in public float from certain disclosure requirements. They find that firms choosing to voluntarily continue such disclosures after the regulatory change nonetheless experience a drop in liquidity, although the decline is not as great as it is for firms that stop disclosing. They interpret their results as supporting the argument that mandatory disclosure serves as a credible commitment device that perhaps cannot be duplicated by voluntary disclosure.

B. Risk Disclosures

Early research in this area examines mandatory quantitative disclosures detailing firms' market risk exposures (e.g., Rajgopal 1999; Linsmeier et al. 2002; Jorion 2002). The findings show that these disclosures are correlated with market-based measures of risk and equity prices. More recent work uses textual analysis tools to analyze qualitative risk disclosures. For example, Li (2006) counts the frequency of the word stems "risk" and "uncertain" appearing anywhere in the 10-K for a sample period that predates the risk factor disclosure mandate, 1993 to 2004, and finds that an increase in the risk sentiment is associated with lower future earnings and equity returns. Kravet and Muslu (2013) also study the risk sentiment in 10-Ks by counting the number of sentences containing risk-related keywords.⁸ They find that increases in this measure are associated with increased stock return volatility and trading volume around the filing date, as well as increased volatility of analyst forecast revisions. Their sample period spans the PSLRA safe harbor and the risk factor disclosure mandate, 1994 to 2007, but their study does not compare the two disclosure regimes, nor does it focus on risk factor disclosures. Campbell et al. (2014) examine the number of words and specific keywords in Item 1A and find a positive association between the length of risk factor disclosures and postdisclosure market beta and stock return volatility. Their study is limited, however, to the postmandate period, 2005–2008.

C. Litigation Risk and Disclosure

The relation between litigation risk and disclosure is complex. On the one hand, high litigation risk can reduce managers' incentives to provide forecasts. For example, Rogers and Van Buskirk (2009) find that firms reduce disclosure in the immediate aftermath of a lawsuit filing. Baginski et al. (2002) report that firms in the United States issue fewer forecasts of both good and bad news than do firms in the (then) less litigious Canadian environment. Moreover, U.S.

⁸However, six of the 20 risk-related keywords (i.e., can, could, may, might, potential, and possible*) are explicitly used by companies to identify forward-looking statements when invoking the protection of the safe harbor. See Section V.3 and the online appendix. Thus, it is unclear the extent to which their measure is capturing risk disclosure as opposed to forward-looking disclosure.

firms were significantly less likely to provide forecasts before the PSLRA's safe harbor provision was enacted increasing protection for forward-looking disclosures (Johnson et al. 2001).

On the other hand, when faced with bad news, managers have an incentive to provide an early warning of the earnings shortfall to reduce the likelihood and expected costs of litigation (Skinner 1994; Kasznik & Lev 1995). Although timely disclosure of bad news does not always deter the filing of a lawsuit (Francis et al. 1994), it can deter certain types of lawsuits (Field et al. 2005) and reduce the expected costs of resolving litigation (Skinner 1997).

D. Contribution

We extend the literature summarized above in several important directions. We provide direct evidence on how a shift from a regime providing incentives for voluntary disclosure to one mandating disclosure affects the information disclosed and its usefulness to investors. Prior research on disclosure regulation generally infers the consequences of a disclosure mandate from its capital market effects without directly linking the market response to disclosure practices and attributes under the alternative regimes. Moreover, we also consider whether the requirement to disclose an item affects the quality of disclosures for the firms that already voluntarily provide the information, an important issue that has not been addressed in the literature. If firms were already fully disclosing relevant risk factors in response to the incentive provided by the PSLRA, the SEC's introduction of a mandate in 2005 would have no effect.

With respect to our particular focus on risk factor disclosures, prior research does not consider firms' responses to changes in disclosure regime. Moreover, these studies generally focus on a single disclosure property, most often the amount of disclosure, whereas we develop and test predictions for three complementary measures that explain variation in risk factor disclosures in general and in relation to MD&A. Finally, this work, and prior textual analysis research in general, gives little consideration to managers' disclosure incentives (Li 2010). We examine the complementary role of legal incentives and regulatory mandates in risk factor disclosures. Moreover, the focus of litigation-related disclosure research has been on managements' voluntary earnings forecasts. In this article, we turn our attention to incentives to disclose risk factors in the Form 10-K as a preemptive means of controlling firms' exposure to litigation.

IV. HYPOTHESIS DEVELOPMENT

Based on the institutional background and prior research discussed above, we develop a series of hypotheses for our empirical tests. In particular, we examine the association between the risk of securities fraud litigation and risk factor disclosures, firms' response to the SEC's 2005 disclosure mandate, and the relevance of risk factor disclosures to investors.

A. Litigation Risk and Risk Factors

All else equal, the greater the probability of litigation, the greater the expected benefits from disclosing risk factors under the PSLRA. Prior research presents empirical evidence

consistent with the PSLRA's safe harbor reducing expected legal costs. For example, the likelihood an earnings warning will result in a lawsuit filing or an allegation of false or misleading projections is significantly lower after enactment of the PSLRA (Johnson et al. 2007), suggesting the safe harbor dissuades potential plaintiffs from pursuing disclosure-related complaints. Moreover, lawsuits containing allegations of fraud in forward-looking statements are more likely to be dismissed in the post-PSLRA period (Pritchard & Sale 2005), which also reduces defendants' legal costs from securities fraud class actions.

For some firms, however, the expected legal benefits of risk factor disclosure will be less apparent. Firms that are unlikely to be sued have little incentive to craft a meaningful risk factor discussion, especially when weighed against the potential business and personal costs of disclosure. Although the marginal administrative costs of formulating the disclosure are likely slight relative to the overall costs of preparing the 10-K, managers face a range of incentives to withhold unfavorable information (Kothari et al. 2009). Risk factors by their very nature convey information about a firm's vulnerabilities and potential adverse outcomes that could be exploited by competitors and investors, leading to negative career consequences for managers. Trading off these costs against the legal benefits of disclosure, firms are likely to minimize risk factors unless there is a nontrivial probability of being sued.⁹

To trigger safe harbor protection, risk factors must be "meaningful." We posit that firms at greater risk of litigation will provide more "meaningful" risk factor disclosure. As discussed above, the Conference Report (1995) states that risk factors must convey "substantive information." Given this prescription, and the courts' interpretation that risk factors are not meaningful if they are "cursory," we expect firms with higher litigation risk to provide more risk factor disclosure:

H1a: Firms at greater risk of litigation provide more risk factor disclosure.

The Conference Report (1995) also states that "boilerplate warnings" repeated from year to year are inadequate. Courts assessing the adequacy of firms' risk factors examine whether firms update their disclosed risks to reflect the current operating environment. The ordinary practice of managers and lawyers preparing SEC filings is to cut and paste from the previous filing, and then revise to reflect any developments in the business. If the risk factors are not updated, they are less likely to provide protection against suit. Accordingly, we test the following hypothesis:

H1b: Firms at greater risk of litigation provide less boilerplate risk factor disclosure.

Courts have also held that risk factors must be comprehensible to provide a meaningful warning. As a result, risk factors that use excessive legalese or contain highly technical business terms may not secure safe harbor protection. Thus, we posit a positive association between litigation risk and the readability of risk factor disclosure:

H1c: Firms at greater risk of litigation provide more readable risk factor disclosure.

⁹We are not aware of any a priori reason to expect that the costs of disclosure, whether administrative, proprietary, or personal, are related to the ex-ante probability of being sued.

The risk of securities litigation is not static; firms may vary in their exposure as their business environment changes. If firms with higher litigation risk have incentives to provide more meaningful risk factor disclosure, we expect an increase in litigation risk to trigger the disclosure of more risk factor information that is less boilerplate and more readable. Moreover, we expect the sensitivity of risk factor disclosure to increases in litigation risk to be more pronounced for firms already at a high risk of being sued, as marginal changes in litigation exposure for low-risk firms are unlikely to subject them to a substantial risk of a lawsuit. This line of reasoning leads to our second hypothesis:

H2: In response to an increase in litigation risk, firms at greater risk of litigation provide more risk factor disclosure that is less boilerplate and more readable.

Firms may not be as responsive to a decrease in litigation risk. Once a firm has identified and described a risk factor, the marginal cost of including it in subsequent filings is likely to be small. Even if a risk factor no longer provides substantial benefit in terms of reducing litigation exposure, there is likely to be a presumption favoring its continuance unless the factor becomes obviously irrelevant, such as “Year 2000” risk disclosures in 2001 and beyond. Nevertheless, the “stickiness” of both disclosure and litigation risk in general biases against finding results consistent with H2. However, as suggested by Li (2010), we conduct this additional analysis to assess the robustness of our results.

B. Disclosure Regulation and Risk Factors

The SEC’s 2005 risk factor disclosure requirement mandated a category of disclosure that was previously voluntary, albeit with a legal incentive to disclose in the form of the PSLRA’s safe harbor. Given that preexisting incentive, however, the mandate likely had a differential effect on firms depending on what disclosure, if any, they had already been providing. If our prior hypotheses are correct, firms with high litigation risk had an incentive to disclose meaningful risk factor information prior to the mandate. Therefore, in the voluntary disclosure regime, we expect firms at greater risk of litigation to disclose significantly more risk factor information that is less boilerplate and more readable. Because the SEC also wants companies to provide detailed risk factors while avoiding boilerplate and complex language, as discussed above, we expect that the disclosure mandate and accompanying scrutiny by the Division of Corporation Finance will induce firms that previously had little incentive to disclose (i.e., firms with low litigation risk) to produce more meaningful risk factor disclosures. Thus, in the mandatory disclosure regime, we expect the difference in the risk factor disclosures of high- and low-litigation-risk firms to narrow as the low-risk firms enhance their risk factor disclosure.¹⁰ We summarize these predictions in our third hypothesis:

¹⁰This is not to suggest that the mandate would have no effect on high-litigation-risk firms that were previously disclosing risk factors. The SEC’s adoption of a mandate implied that the Division of Corporation Finance would now be policing such disclosures through the review and comment process. Thus, the disclosure mandate could induce even previously disclosing firms to be more forthcoming. Nevertheless, we expect any such changes to be small at the margin relative to the changes necessitated by the mandate for firms with low litigation risk.

H3a: In the voluntary disclosure regime, firms at greater risk of litigation provide more risk factor disclosure that is less boilerplate and more readable.

H3b: In the mandatory disclosure regime, firms at lower risk of litigation provide risk factor disclosure (amount, boilerplate, and readability) that is more similar to that provided by firms with high litigation risk.

C. Risk Factors and Investors' Risk Assessments

Risk factor disclosures, if meaningful, should allow investors to make more precise estimates of the risks associated with firms' expected future cash flows. Thus, the attributes of meaningful risk factor disclosures discussed above should be positively associated with the market's assessment of firm risk (i.e., beta and stock return volatility). However, our prior hypotheses also suggest that meaningful risk factor disclosure varies systematically with firms' disclosure incentives and the disclosure regime. In particular, we posit that firms at greater risk of litigation provide more meaningful risk factor disclosures, particularly during the voluntary disclosure regime. Thus, our final hypothesis is as follows:

H4: The information content of risk factor disclosures is positively associated with the market's assessment of firm risk, particularly for firms at higher risk of litigation in the voluntary disclosure regime.

V. RESEARCH DESIGN

A. Sample Selection

During the voluntary disclosure period, 1996–2004, firms electing to disclose risk factors were not required to do so in any specific section of the 10-K, and hence there are no markers that can be used to reliably identify and extract the relevant risk factor discussion using a text analysis algorithm.¹¹ For this reason, the risk factor text must be manually identified and collected, necessitating the selection of a sample of firms for testing. To do this, we estimate firm-specific ex-ante litigation risk for each year in the voluntary disclosure period and then select two subsamples—one with high litigation risk and the other with low litigation risk.

Details of the litigation risk model are provided in the online appendix. The evidence indicates that only observations in the top decile of estimated litigation risk have any substantive risk of being sued. Therefore, for our *High Risk* sample, we randomly select 5 percent of firms from those that rank in the top decile in at least one year of the voluntary disclosure period, for a sample of 181 firms. The *Low Risk* sample consists of firms that never rank above Decile 6 in the voluntary disclosure period. We use this cutoff because the maximum estimated litigation risk for Decile 6 (0.015) is less than the minimum for Decile 10 (0.022), ensuring that litigation risk in the *Low Risk* sample

¹¹The location of the risk factor disclosure, if any, during the voluntary disclosure period varies, but is typically found within either Item 7 (Management Discussion and Analysis) or Item 1 (Business). During the mandatory disclosure period, risk factors are required to be disclosed in Item 1A (Risk Factors). Prior research on risk disclosures, discussed in Section III.B, either searches the entire 10-K for risk-related keywords (Li 2006; Kravet & Muslu 2013) or focuses only on the mandatory disclosure period (Campbell et al. 2014).

Table 1: Sample Observations by Litigation Risk Decile

Litigation Risk Decile	Voluntary Disclosure Period (1996–2004)		Mandatory Disclosure Period (2005–2010)	
	Low Risk	High Risk	Low Risk	High Risk
1	117	31	46	27
2	137	44	47	24
3	104	51	34	26
4	85	69	28	23
5	57	79	18	28
6	37	95	18	39
7		120	9	37
8		132	11	60
9		189	6	57
10		267	4	77
Total	537	1,077	221	398

NOTE: This table reports the number of observations in each litigation risk decile. The sample is constructed by first estimating firm-specific litigation risk annually for each year of the voluntary disclosure period (1996–2004) using the model specified in the online appendix. *High Risk* firms are defined as those that rank in Decile 10 in at least one year in the voluntary disclosure period. *Low Risk* firms are defined as those that never rank above Decile 6 in any year in the voluntary disclosure period. A random sample of 181 (112) *High Risk* (*Low Risk*) firms is selected, representing approximately 5 percent of the firms in each risk group. The sample is then followed through the mandatory disclosure period (2005–2010).

does not exceed that of the *High Risk* firms. We again randomly select 5 percent of the firms in this group, resulting in 112 *Low Risk* firms. To examine the effects of the risk factor disclosure mandate, we follow the sample of *High Risk* and *Low Risk* firms through the mandatory disclosure period, 2005–2010, for which we again obtain firm-specific litigation risk estimates for each year using the model described in the online appendix.¹²

Table 1 reports the distribution of sample observations by litigation risk decile. By construction in the voluntary disclosure period, observations in the *Low Risk* sample never rank above Decile 6. Even so, two-thirds of the observations cluster in Deciles 1–3. Conversely, observations in the *High Risk* sample are skewed toward the highest risk deciles, with Decile 10 containing one-quarter of the observations, and Deciles 8–10 more than half the sample. Because we include all firm-years in our analysis, however, some observations fall into the lower deciles. The sample profile is similar in the mandatory disclosure period, suggesting that litigation risk is relatively stable over time. Specifically, observations in the *Low Risk* (*High Risk*) sample cluster in the extreme low (high) litigation risk deciles.¹³

¹²We verify that the randomly selected *High Risk* and *Low Risk* samples are representative of the population of firms from which they are drawn. Specifically, in untabulated tests we find that the mean and median estimated probability of litigation and the litigation risk decile of the sample observations are not significantly different from their respective populations in either the voluntary or mandatory disclosure periods.

¹³There are 30 observations in the *Low Risk* group that are in Deciles 7–10 during the mandatory disclosure period. Because our objective is to study how firms' disclosure policies evolve across regulatory regimes, we retain these observations in our primary tests. Untabulated supplemental analysis reveals, however, that their exclusion does not alter inferences.

B. Risk Factor Disclosure Measures

For each firm-year in the sample, we obtain the annual filing from the SEC's online EDGAR system and manually extract the applicable risk factor text. We develop three proxies to measure the properties of firms' risk factor disclosures discussed in Section II. To assess the amount of risk factor disclosure, we use the word count of the risk factors disclosure. As shown in Figure 1, Panel A, disclosure by the *High Risk* sample increases steadily over the sample period, from a median of 265 words in 1996 to 6,602 words in 2010. In contrast, disclosure by the *Low Risk* sample is relatively flat throughout the voluntary disclosure period, never exceeding 600 words at the median, but increases sharply beginning in 2005 with the risk factor disclosure mandate before leveling off in 2007. During the mandatory disclosure period, disclosure by the *Low Risk* sample is still typically less than half that of the *High Risk* sample.

It is possible that the increase in the amount of risk factor disclosure over time reflects a general trend toward longer corporate disclosures (e.g., Francis et al. 2002; Li 2008) rather than a specific trend related to risk factors. Similarly, the difference between the *High Risk* and *Low Risk* samples could be driven by differences in these firms' general disclosure tendencies rather than by litigation risk. Thus, we also examine the word count of risk factors relative to the word count of MD&A in Panel B of Figure 1.¹⁴ For the *High Risk* sample, the results reveal a rapid increase in the relative amount of risk factor disclosure until 2000, after which it levels off at approximately 50 percent of MD&A. For the *Low Risk* sample, risk factors are approximately 10 percent of MD&A until 2005, but under the disclosure mandate quickly converge to the same relative level as the *High Risk* sample.

Our second measure assesses the extent to which risk factors repeat language from the prior year. Theoretical and empirical work in linguistics shows that the frequency distribution of words is highly skewed; a few words are used very often but most words are used rarely (Manning & Schütze 1999). This distinctive distribution is more pronounced for word bigrams (a sequence of two adjacent words) and even more so for word trigrams (a sequence of three adjacent words).¹⁵ If the probability of a word occurring is low, the probability of it occurring in conjunction with others is even lower. Independently written documents, even if they are on the same or similar subjects or are written by the same author at different points in time, typically have few matching trigrams.¹⁶

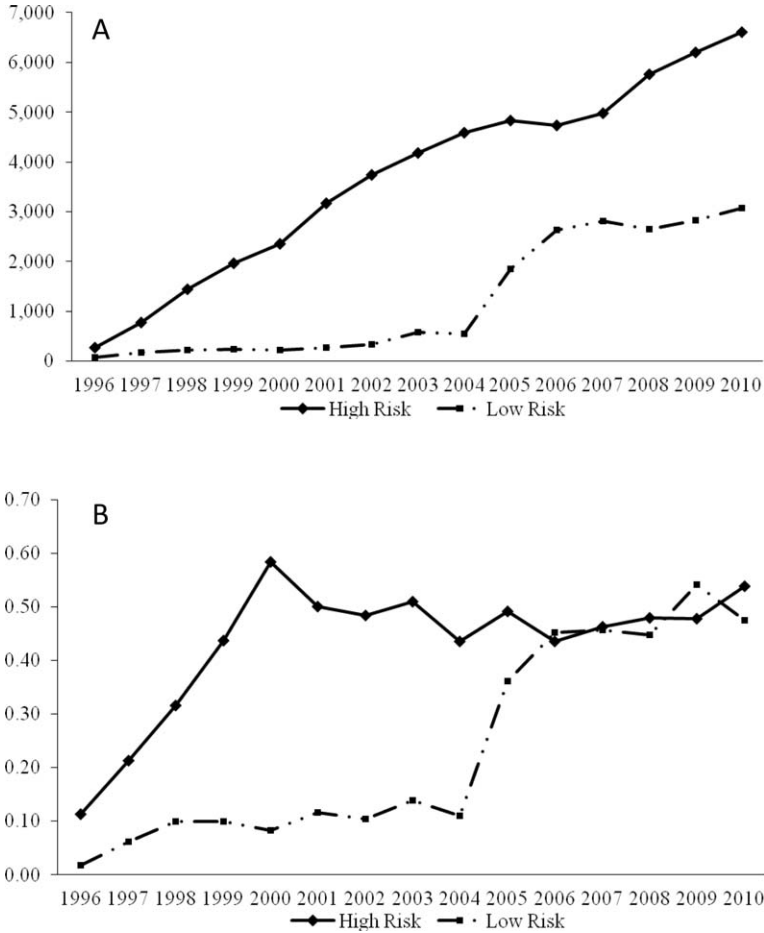
To measure the extent to which risk factor disclosures are cut and pasted from the prior year, we first convert each disclosure into a set of trigrams. The set of trigrams

¹⁴During the voluntary disclosure period, some firms disclose their risk factors in the MD&A section. In these cases, we exclude the risk factor language from the MD&A text for purposes of our analysis.

¹⁵For example, the sentence "A storm is forecast for today" has four overlapping trigrams: (a storm is), (storm is forecast), (is forecast for), (forecast for today).

¹⁶For example, Gibbon et al. (1997) report that even in a sample of *Wall Street Journal* articles comprising over 38 million words, 77 percent of trigrams occurred only once. Lyon et al. (2001) investigate the use of n -grams as lexical features and find that single words and bigrams have low power to identify similar text relative to trigrams. The ability to detect similar text is reduced for $n > 3$.

Figure 1: Word count of risk factors by year.



NOTE: This figure presents the median word count of risk factors (Panel A) and the median ratio of the word count of risk factors divided by the word count of MD&A (Panel B) for the *High Risk* and *Low Risk* samples.

in the reference document, denoted $S(A)$, is then compared with that of the comparison document, denoted $S(B)$, and the resemblance between the two documents is determined as follows:

$$\text{Resemblance} = \frac{|S(A) \cap S(B)|}{|S(A) \cup S(B)|}, \tag{1}$$

where $0 \leq \text{Resemblance} \leq 1$. Two identical documents have a *Resemblance* score of 1. We focus our analysis on one-year *Resemblance* scores, that is, a comparison of risk factor

disclosures for firm i in year t relative to year $t - 1$. The *Resemblance* score thus provides a simple and intuitive measure of text similarity that is grounded in linguistics theory.

Figure 2, Panel A compares *Resemblance* scores for the *High Risk* and *Low Risk* samples. As expected, *Resemblance* is systematically lower for the *High Risk* sample, indicating that these firms annually revise risk factor disclosures to a greater extent than *Low Risk* firms.¹⁷ There is a sizeable drop in *Resemblance*, however, for the *Low Risk* sample in 2005, consistent with the dramatic increase in the amount of risk factor discussion by these firms to comply with the disclosure mandate as shown in Figure 1. The decline was short-lived, however, as *Resemblance* for the *Low Risk* sample rebounded to its pre-2005 level by 2007. There is also a smaller drop in *Resemblance* in 2005 for the *High Risk* sample, but the level is not outside of its historical range. Panel B compares the *Resemblance* of risk factors relative to that of MD&A. The ratio is greater than 1 in all years for both the *High Risk* and *Low Risk* samples, indicating that risk factors are updated to a lesser extent than MD&A. Nevertheless, there is relatively more boilerplate language in the risk factors of *Low Risk* firms throughout the voluntary disclosure period, only converging with the *High Risk* firms after the risk factor disclosure mandate.

Our third measure assesses the readability of the risk factor disclosures. Following prior research (e.g., Li 2008), we use the Fog index of text complexity, which measures readability as a function of syllables per word and words per sentence:

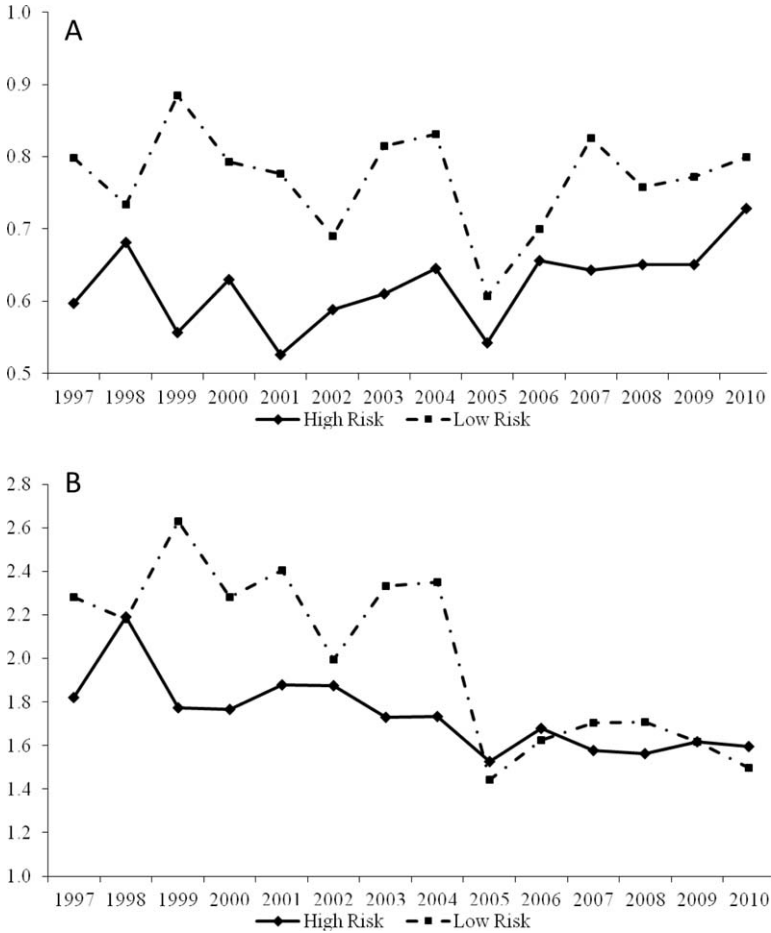
$$\text{Fog} = (\text{words per sentence} + \text{percent of complex words}) \times 0.40, \quad (2)$$

where complex words are defined as words with three syllables or more. *Fog* indicates the number of years of formal education a person of average intelligence would need to understand the text after reading it once; thus, a higher *Fog* score indicates a less readable document.

Figure 3, Panel A shows that *High Risk* firms generally provide more readable risk factor disclosures than *Low Risk* firms during the voluntary disclosure period. Following the risk factor mandate, readability improves substantially in 2005 and 2006 for the *Low Risk* firms. Conversely, there is some evidence that readability deteriorated for *High Risk* firms, although the level remained within its historical range. Relative to MD&A, Panel B shows that the readability of risk factors for *Low Risk* firms converged toward that of the *High Risk* firms during the mandatory disclosure period. In all years, however, risk factors are more difficult to read than MD&A, as evidenced by a ratio greater than 1, consistent with SEC concerns regarding the use of “legalese” in risk factors.

¹⁷Nevertheless, the *Resemblance* scores in Figure 2 are quite high by usual standards; median *Resemblance* in the *High (Low) Risk* sample is approximately 0.61 (0.77). To put these findings in context, we examine one-year *Resemblance* scores between firms, that is, for firm i in year t relative to firm j in year $t - 1$. For all permutations of firm pairings, mean (median) *Resemblance* is 0.02 (0.01); the 99th percentile is 0.07. We find similar results for *Resemblance* between firms in the same year, that is, for firms i and j in year t . These results are comparable to findings in other settings (e.g., Lyon et al. 2001; Bao & Malcolm 2006), where the average *Resemblance* score typically ranges between 0.01 and 0.03. Thus, the results in Figure 2 indicate that the year-to-year *Resemblance* in firms’ risk factors is quite high, consistent with the SEC’s concerns about boilerplate disclosure.

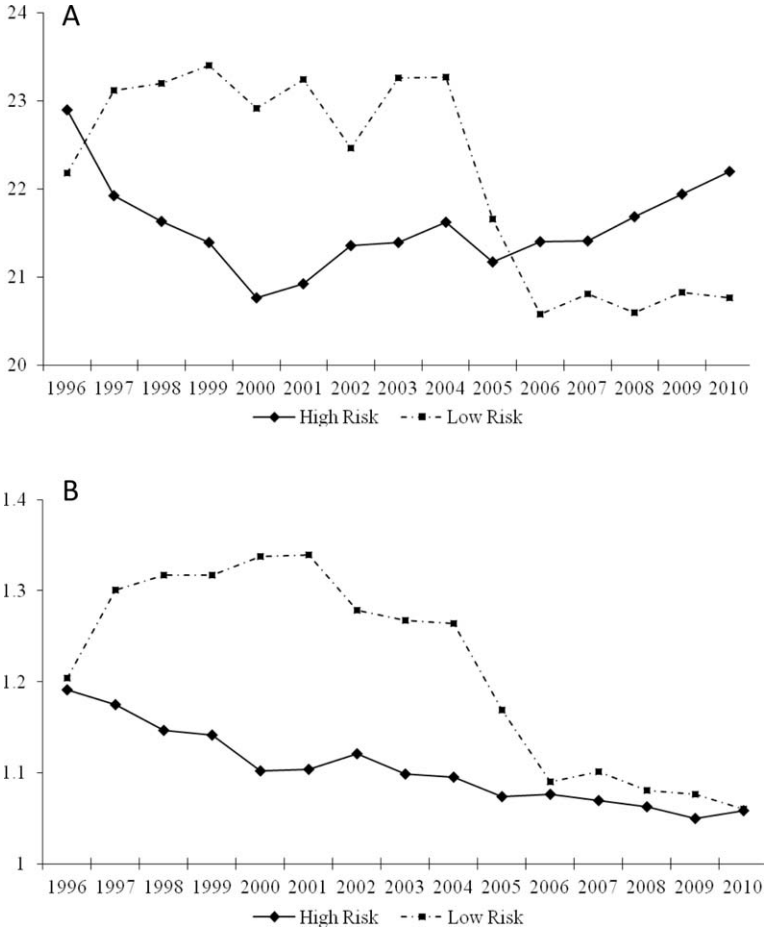
Figure 2: Resemblance score of risk factors by year.



NOTE: This figure presents the median resemblance score of risk factors (Panel A) and the median ratio of the resemblance score of risk factors divided by the resemblance score of MD&A exclusive of any risk factor language (Panel B) for the *High Risk* and *Low Risk* samples. The resemblance score is calculated as $\frac{|S(A) \cap S(B)|}{|S(A) \cup S(B)|}$, where $S(A)$ is the set of word trigrams (i.e., sequence of three adjacent words) in the reference document A and $S(B)$ is the set of trigrams in the comparison document B. The figure shows one-year resemblance scores, i.e., a comparison of risk factor disclosures for firm i in year t relative to year $t - 1$.

Overall, the graphical evidence provides preliminary support for our hypotheses regarding the incentives of *High Risk* firms to voluntarily provide meaningful risk factor disclosures under the PSLRA and the subsequent effect of the disclosure mandate on the quality of risk factor disclosures provided by *Low Risk* firms. This interpretation assumes, however, that litigation risk of the *Low Risk* sample does not converge with the *High Risk* sample during the postmandate period. If this were the case, the findings in

Figure 3: Fog index of risk factors by year.



NOTE: This figure presents the median Fog index of risk factors (Panel A) and the median ratio of the Fog index for risk factors divided by the Fog index for MD&A exclusive of any risk factor language (Panel B) for the *High Risk* and *Low Risk* samples. The Fog index indicates the number of years of formal education a reader of average intelligence would need to understand the text after reading it once, and is calculated as (words per sentence + percentage of complex words) \times 0.40. Complex words are defined as words with three syllables or more.

Figures 1–3 could be driven by the changing risk profile rather than the disclosure mandate. To rule out this alternative, Table 2 compares the litigation risk of the *High Risk* and *Low Risk* samples in the voluntary (Panel A) and mandatory (Panel B) disclosure periods, where *Lit_Prob* is the estimated probability of litigation and *Lit_Rank* is the decile rank of this estimate, both as described in the online appendix. We find that litigation risk is significantly higher at the 0.01 level for the *High Risk* sample in both disclosure regimes. Thus, the convergence in the properties of postmandate risk factor

Table 2: Descriptive Statistics

Variable	Low Risk				High Risk				Test of Differences	
	Obs.	Mean	Median	Std. Dev.	Obs.	Mean	Median	Std. Dev.	Mean	p-value
<i>Panel A: Distributional Statistics—Voluntary Disclosure Period</i>										
Lit_Prob	537	0.00	0.00	0.00	1,077	0.04	0.02	0.07	<0.01	<0.01
Lit_Rank	537	2.89	3.00	1.52	1,077	7.22	8.00	2.60	<0.01	<0.01
Count	537	5.03	5.48	2.57	1,077	7.04	7.72	1.91	<0.01	<0.01
Resemblance	345	0.70	0.78	0.28	863	0.55	0.59	0.28	<0.01	<0.01
Fog	445	24.22	22.98	5.67	1,041	23.49	21.42	7.54	0.04	<0.01
Count_MDA	537	7.92	7.88	0.72	1,077	8.60	8.60	0.69	<0.01	<0.01
Resemblance_MDA	345	0.34	0.36	0.12	863	0.32	0.32	0.13	0.02	0.01
Fog_MDA	445	18.46	18.38	1.55	1,041	19.28	19.22	1.47	<0.01	<0.01
Forward_MDA	537	0.01	0.01	0.01	1,077	0.02	0.02	0.01	<0.01	<0.01
ScaledDisclosure	537	0.13	0.00	0.33	1,077	0.05	0.00	0.22	<0.01	<0.01
BigN	524	0.86	1.00	0.35	1,040	0.90	1.00	0.31	0.04	0.03
LogMVE	524	4.05	3.93	1.48	1,040	5.76	5.72	2.20	<0.01	<0.01
MTB	524	2.34	1.49	3.56	1,039	3.19	2.52	8.60	0.01	<0.01
Delaware	524	0.47	0.00	0.50	1,040	0.72	1.00	0.45	<0.01	<0.01
Restructure	524	0.06	0.00	0.24	1,040	0.17	0.00	0.37	<0.01	<0.01
Segments	524	1.79	1.00	1.18	1,040	1.79	1.00	1.47	0.61	<0.01
Beta _{t+1}	489	0.37	0.48	0.53	985	1.51	1.38	0.91	<0.01	<0.01
Std_AbRet _{t+1}	489	0.04	0.03	0.03	985	0.05	0.04	0.03	<0.01	<0.01

Table 2 Continued

Variable	Low Risk			High Risk			Test of Differences	
	Obs.	Mean	Median	Std. Dev.	Obs.	Mean	Median	p-value
<i>Panel B: Distributional Statistics—Mandatory Disclosure Period</i>								
Lit_Prob	221	0.01	0.00	0.01	398	0.03	0.01	<0.01
Lit_Rank	221	3.61	3.00	2.38	398	6.64	7.00	<0.01
Count	221	7.39	7.87	1.91	398	8.50	8.59	<0.01
Resemblance	220	0.63	0.75	0.30	397	0.62	0.64	<0.01
Fog	220	20.75	20.85	5.88	398	21.83	21.67	<0.01
Count_MDA	221	8.71	8.69	0.55	398	9.22	9.26	<0.01
Resemblance_MDA	220	0.43	0.43	0.10	397	0.39	0.39	<0.01
Fog_MDA	220	19.23	18.98	1.49	398	20.22	20.26	<0.01
Forward_MDA	221	0.02	0.02	0.01	398	0.02	0.02	0.17
ScaledDisclosure	221	0.31	0.00	0.46	398	0.09	0.00	0.01
BigN	218	0.56	1.00	0.50	391	0.83	1.00	<0.01
LogMVE	218	4.64	4.43	1.43	391	6.63	6.83	<0.01
MTB	218	1.94	1.50	1.89	391	2.71	2.04	<0.01
Delaware	218	0.46	0.00	0.50	391	0.76	1.00	<0.01
Restructure	218	0.16	0.00	0.36	391	0.41	0.00	<0.01
Segments	218	1.16	1.00	0.64	391	1.23	1.00	0.26
Beta _{t+1}	204	0.80	0.71	0.62	357	1.10	1.02	<0.01
Std_AbRet _{t+1}	204	0.04	0.03	0.02	357	0.03	0.03	0.08

NOTE: This table reports descriptive statistics for the Low Risk and High Risk samples in the voluntary (1996–2004) (Panel A) and mandatory (2005–2010) (Panel B) disclosure periods. Risk is an indicator variable equal to 1 (0) for High (Low) Risk firms; Lit_Prob is the estimated probability of litigation and Lit_Rank is the decile rank of this estimate, both as described in the online appendix; Count is the natural log of the number of words in the risk factor disclosure; Resemblance is calculated as $\frac{S(A) \times S(B)}{S(A) \times S(B)}$, where S(A) and S(B) are the set of trigrams (a sequence of three adjacent words in a sentence) in texts A and B; Fog is the number of years of formal education a reader of average intelligence would need to understand the text after reading it once, and is calculated as (words per sentence + percentage of complex words) $\times 0.40$, where complex words are defined as words with three syllables or more; Count_MDA, Resemblance_MDA, and Fog_MDA are calculated in an analogous fashion using MD&A, exclusive of any risk factor disclosure; Forward_MDA is the number of forward-looking words in the firm's MD&A (identified in the online appendix), divided by the total number of words in MD&A; ScaledDisclosure is an indicator variable equal to 1 for firms able to adopt the reduced disclosure requirements under the Smaller Reporting Company Rule or its predecessor, Regulation SB; BigN equals 1 if the firm is audited by a top-tier auditor, and 0 otherwise; LogMVE is the natural log of the market value of equity; MTB is the market value of the firm divided by the book value of common equity; Delaware equals 1 if the firm is incorporated in Delaware, and 0 otherwise; Restructure equals 1 if the firm engaged in restructuring activity, and 0 otherwise; Segments is the number of reported business segments; Beta_{t+1} is the slope coefficient from a regression of daily returns on the CRSP equal-weighted market index and Std_AbRet_{t+1} is the standard deviation of daily abnormal stock returns, both measured over the 250 trading days beginning two days after the release of the 10-K; Continuous variables are winsorized at 1 percent and 99 percent. All reported p-values are two-tailed.

disclosures observed in Figures 1–3 is not associated with a corresponding convergence in litigation risk.¹⁸ In the next section, we develop the empirical models we use to formally test our hypotheses.

C. Empirical Models

To examine the association between litigation risk and risk factor disclosures, we estimate the following regression model:

$$\begin{aligned} \text{Disclosure} = & \beta_1 \text{Risk} + \beta_2 \text{Disclosure_MDA} + \beta_3 \text{Forward_MDA} \\ & + \beta_4 \text{ScaledDisclosure} + \beta_5 \text{BigN} + \beta_6 \text{LogMVE} + \beta_7 \text{MTB} \\ & + \beta_8 \text{Delaware} + \beta_9 \text{Restructure} + \beta_{10} \text{Segments} + \varepsilon \end{aligned} \quad (3)$$

where *Disclosure* indicates one of the three risk factor disclosure metrics discussed above, (1) *Count*, the natural log of 1 plus the number of words in the risk factors discussion, (2) *Resemblance*, or (3) *Fog*. For notational convenience, we suppress year and firm subscripts. The main variable of interest is the litigation risk proxy, *Risk*, an indicator variable equal to 1 if the firm is in the *High Risk* sample, and 0 otherwise. H1 predicts that *Risk* is positively (negatively) associated with *Count* (*Resemblance* and *Fog*).

We report results for two alternative specifications of Equation (3). The first specification pools all observations to estimate the average association between litigation risk and the three risk factor disclosure metrics across the sample period. The second specification allows the coefficient estimate on *Risk* to vary for the voluntary and mandatory disclosure regimes. To the extent that the disclosure mandate causes *Low Risk* firms to provide risk factor disclosures more similar to those of *High Risk* firms in the postmandate period, H3 predicts that the coefficient estimate on *Risk* in the mandatory disclosure period will be insignificant and/or less than the coefficient estimate in the voluntary disclosure period.

To control for firms' general disclosure tendencies, we include *Disclosure_MDA*, which indicates one of the three disclosure metrics calculated using the firm's MD&A (exclusive of any risk factor disclosure). Specifically, *Count_MDA* is the natural log of the number of words, *Resemblance_MDA* is the one-year Resemblance score, and *Fog_MDA* is the Fog index for MD&A. Including the relevant MD&A disclosure measure not only mitigates concerns regarding correlated omitted variables, but also allows us to differentiate the characteristics of risk factors relative to other disclosures in the 10-K.

¹⁸There is some evidence of a marginal decrease in litigation risk for the *High Risk* sample, from a mean (median) *Lit_Prob* of 0.04 (0.02) in the voluntary regime to 0.03 (0.01) in the mandatory regime. Despite this decrease, the properties of the risk factor disclosures of *High Risk* firms remain relatively fixed during the mandatory disclosure regime. Although there is also some evidence of a marginal increase in litigation risk of *Low Risk* firms, from a mean *Lit_Prob* of 0.00 in the voluntary period to 0.01 in the mandatory period, this effect is driven by the small number of *Low Risk* firms migrating to a higher risk decile during the mandatory disclosure period, as discussed in footnote 13. Excluding these 30 observations, the estimated litigation risk marginally *decreases* in the postmandate period and, as noted above, these observations do not alter our inferences. Thus, there is no evidence that changes in the risk profiles of the *High Risk* and *Low Risk* samples is driving our results.

Forward_MDA is the number of forward-looking words in the firm's MD&A divided by the total number of words in the MD&A. When invoking safe harbor protection, firms typically indicate keywords that identify forward-looking statements.¹⁹ We read a sample of these invoking statements to formulate the list of forward-looking words shown in the online appendix. Firms that provide relatively more forward-looking disclosure, as indicated by the use of these keywords, likely have greater incentives to provide meaningful risk factor disclosures. *ScaledDisclosure* is an indicator variable equal to 1 for firms eligible to adopt the reduced disclosure requirements under the Smaller Reporting Company Rule or its predecessor, Regulation S-B. Because of scaled reporting for these firms, they may be less likely to provide meaningful risk factor disclosures.

BigN is an indicator variable equal to 1 for one of the top-tier external auditors.²⁰ Firms that invest in a high-quality auditor may be more likely in general to provide high-quality disclosures. *LogMVE* is the natural log of the market value of equity. Prior research shows that disclosure quality is positively related to firm size (e.g., Lang & Lundholm 1993). Following Li (2008), we control for business risk using growth, as measured by the market-to-book ratio (*MTB*), and complexity of operations using the number of business segments (*Segments*). *Delaware* is an indicator variable equal to 1 for firms incorporated in Delaware. Firms with greater exposure to shareholder lawsuits may choose to incorporate in Delaware because it affords more certain liability protection for officers and directors (Jagannathan & Pritchard 2015). This concern for liability may also cause managers of these firms to provide more meaningful risk factors. We include *Restructure*, an indicator variable equal to 1 if the firm engaged in restructuring activity, as a control for financing activities that could affect the quality of disclosure. Finally, we include both year and industry fixed effects (based on the Fama French 48-industry classification) and base statistical inferences on standard errors clustered by firm.

To examine whether firms' risk factor disclosures are sensitive to changes in litigation risk, we estimate the following regression model:

$$\begin{aligned} \Delta Disclosure = & \beta_1 IncRisk + \beta_2 DecRisk + \beta_3 \Delta Disclosure_MDA + \beta_4 \Delta Forward_MDA \\ & + \beta_5 ScaledDisclosure + \beta_6 BigN + \beta_7 LogMVE + \beta_8 MTB \\ & + \beta_9 Delaware + \beta_{10} Restructure + \beta_{11} Segments + \varepsilon \end{aligned} \quad (4)$$

where $\Delta Disclosure$ measures the change in risk factor disclosure. Specifically, $\Delta Count$ is

¹⁹For example, Parlex Corp.'s 2003 10-K invokes statutory safe harbor protection as follows: "This document includes and incorporates forward-looking statements that are subject to a number of risks and uncertainties. All statements, other than statements of historical facts included or incorporated in this document, regarding our strategy, future operations, financial position and estimated revenues, projected costs, prospects, plans and objectives of management are forward-looking statements. When used in this document, the words 'will,' 'believe,' 'anticipate,' 'intend,' 'estimate,' 'expect,' 'project' and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words."

²⁰During our sample period, the top-tier auditors are Arthur Andersen, Deloitte & Touche, Ernst & Young, KPMG, and PricewaterhouseCoopers.

the natural log of the absolute value of 1 plus the change in the number of words in the risk factor disclosure; for firms with a decrease in disclosure, $\Delta Count$ is multiplied by -1 . Because *Resemblance* measures text similarity across two years, it already captures changes in risk factor disclosure language. Hence, we use *Resemblance* rather than $\Delta Resemblance$ in the estimation of Equation (4).²¹ ΔFog is the change in the Fog index.

We capture changes in litigation risk with *IncRisk* (*DecRisk*), measured as the change in the estimated probability of litigation for positive (negative) changes, and 0 otherwise. In other words, we allow for a potential asymmetric relation between changes in litigation risk and disclosure. We control for firms' general disclosure tendencies with $\Delta Disclosure_MDA$, which measures changes in MD&A disclosure in an analogous fashion to our risk factor disclosure measures, and $\Delta Forward_MDA$, which is the change in the number of forward-looking words in the firm's MD&A divided by the total number of words in MD&A. All other variables are as defined above.

To avoid the confounding effects of changes in disclosure associated with the risk factor disclosure mandate, we exclude 2005 and 2006 from the estimation of Equation (4). Based on the findings in Figures 1–3 discussed above, we expect changes in risk factor disclosure in these years to largely reflect the shift from a voluntary to mandatory disclosure regime, especially for *Low Risk* firms. We test for the effects of the disclosure mandate in the estimation of Equation (3) as described above. In the estimation of Equation (4), however, we are interested in whether firms adjust their risk factor disclosures in response to changes in litigation risk. We do not expect firms' sensitivity to litigation risk to vary with the disclosure regime.²² Including changes in risk factor disclosures because of the transition to the disclosure mandate introduces noise in this analysis. H2 predicts that *IncRisk* is positively (negatively) associated with $\Delta Count$ (*Resemblance* and ΔFog), with *High Risk* firms more responsive to increases in litigation risk than *Low Risk* firms. We expect firms to be less responsive to decreases in litigation risk, and thus we predict that the coefficient estimate on *DecRisk* will be less, in absolute magnitude, than that on *IncRisk*.

Finally, to examine whether risk factor disclosures are associated with the market's assessment of firm risk, we estimate the following regression model:

$$\begin{aligned} \text{MarketRisk}_{t+1} = & \beta_1 \text{Disclosure}_t + \beta_2 \text{Disclosure_MDA}_t + \beta_3 \text{Forward_MDA}_t \\ & + \beta_4 \text{ScaledDisclosure}_t + \beta_5 \text{BigN}_t + \beta_6 \text{LogMVE}_t + \beta_7 \text{MTB}_t \\ & + \beta_8 \text{Delaware}_t + \beta_9 \text{Restructure}_t + \beta_{10} \text{Segments}_t + \beta_{11} \text{MarketRisk}_t + \varepsilon \end{aligned} \quad (5)$$

where *MarketRisk* indicates either *Beta*, the slope coefficient from a regression of daily returns on the CRSP equal-weighted market index, or *Std_AbRet*, the standard deviation

²¹ $\Delta Resemblance$ is equivalent to a changes-in-changes measure, which is not the relevant construct for testing H2.

²²In other words, even after the introduction of the risk factor disclosure mandate, firms are likely to remain cognizant of their liability exposure in making their disclosure decisions.

of daily abnormal stock returns, both measured over the 250 trading days beginning two days after the release of the 10-K for year t . Because we include the determinants of risk factor disclosures from Equation (3), our key variable of interest, *Disclosure*, captures the unexpected portion of disclosed risk factors. Moreover, we control for *MarketRisk* at time t to ensure that the model captures the change in market risk subsequent to the release of the risk factor disclosure. In other words, the empirical model in Equation (5) is econometrically equivalent to a changes model, except that we do not constrain the lagged value of the dependent variable to equal 1.

We report results for two alternative specifications of Equation (5). The first specification allows *Disclosure* to vary for *High Risk* and *Low Risk* firms to examine how disclosure incentives affect the informativeness of risk factor disclosures for future market-based measures of firm risk. The second specification allows the coefficient estimates on *Disclosure* to vary with firms' disclosure incentives (*High Risk* or *Low Risk*) and the regulatory disclosure regime (*Voluntary* or *Mandatory*) to examine whether the disclosure regime has an incremental effect on the informativeness of risk factor disclosures for investors' risk assessments.

VI. RESULTS

A. Descriptive Statistics

Table 2 presents descriptive statistics for the regression variables. Panel A (Panel B) compares mean and median values across the *High Risk* and *Low Risk* samples for the voluntary (mandatory) disclosure period. In the voluntary disclosure period, *Count* is significantly higher in the *High Risk* sample and *Resemblance* and *Fog* are significantly lower, as predicted.²³ In the mandatory disclosure period, the differences in *Count* and *Resemblance* between the *High Risk* and *Low Risk* samples narrow but remain significant with the exception of *Resemblance*, for which the difference is insignificant at the mean. More striking, *Fog* is significantly higher in the *High Risk* sample.

In general, the disclosure patterns in MD&A parallel those found in the risk factors; specifically, *Count_MDA* is higher and *Resemblance_MDA* is lower in the *High Risk* sample in both disclosure regimes. It is interesting to note, however, that resemblance is uniformly lower for MD&A relative to the risk factors, suggesting that firms tend to update MD&A to a greater extent. *Fog_MDA* is significantly higher for *High Risk* firms in both disclosure regimes, suggesting a general tendency for these firms to provide more complex disclosures.

High Risk firms use more forward-looking words in their MD&A, although the difference is significant only in the voluntary disclosure period. In both periods, a significantly higher proportion of the *Low Risk* sample is eligible for scaled disclosure. Moreover, the proportion increases between the voluntary and mandatory disclosure

²³Note that *Fog* is undefined for observations with zero word count and *Resemblance* is undefined for observations with zero word count in either the current or prior year. Hence, the number of available observations for these two measures is less than the full sample size.

periods in both the *Low Risk* and *High Risk* samples, consistent with SEC rules expanding the number of eligible smaller companies. *High Risk* firms are larger, have higher growth, are more likely to employ a top-tier auditor, incorporate in Delaware, and engage in restructuring. Finally, the one-year ahead market-based measures of risk, $Beta_{t+1}$ and Std_AbRet_{t+1} , are significantly higher for the *High Risk* sample in both disclosure regimes. In addition, in the mandatory disclosure period these variables are similar in magnitude to those reported by Campbell et al. (2014) when considering the combined *Low Risk* and *High Risk* samples.

Correlation statistics presented in the online appendix indicate that *Risk* is positively correlated with *Count* and negatively correlated with *Resemblance* and *Fog*, as predicted. Moreover, *Count* is negatively correlated with both *Resemblance* and *Fog*, consistent with firms that provide more risk factor disclosure using less boilerplate and more readable language. *Count*, *Resemblance*, and *Fog* are all positively correlated with their corresponding MD&A-based disclosure measure, demonstrating that firms adopt similar disclosure practices for both risk factors and MD&A. *Forward_MDA* is positively correlated with *Count* but negatively correlated with *Resemblance* and *Fog*, suggesting that providing relatively more forward-looking information in the MD&A is associated with longer risk factor sections that are less boilerplate and use more readable language. The correlations between the disclosure measures, while generally significant in the predicted direction, never exceed 0.65 in absolute magnitude, thus alleviating concerns regarding the potential for multicollinearity to affect our results.

B. Regression Results

Our first set of tests examines the association between litigation risk and the properties of risk factor disclosures in the voluntary and mandatory disclosure regimes. Table 3 presents results regarding the amount of risk factor disclosure. In the first specification reported in Column (1), we find that the amount of risk factor disclosure is increasing in *Risk*, consistent with H1a. The result is significant at the 0.01 level, and indicates that *High Risk* firms, on average, provide more risk factor disclosure than *Low Risk* firms. Consistent with H3a, the second specification in Column (2) reveals that *High Risk* firms disclose significantly more risk factor information in the voluntary disclosure regime, as indicated by a coefficient estimate on *Risk_Voluntary* that is significant at the 0.01 level. *High Risk* firms continue to be more forthcoming in the mandatory regime (significant at the 0.05 level), but the incremental effect of litigation risk on disclosure is significantly reduced (i.e., the equality of the coefficient estimates on *Risk* for the voluntary and mandatory disclosure periods is rejected at the 0.04 level). This finding supports H3b.

The results for the control variables are generally consistent across both specifications in Table 3. Firms providing more risk factor disclosure tend to be more verbose in general, as indicated by the positive and significant coefficient estimate on *Count_MDA*. Risk factors are also increasing with the amount of forward-looking disclosure (*Forward_MDA*), consistent with the incentives provided by the PSLRA's safe harbor. Finally,

Table 3: Association Between Amount of Risk Factor Disclosure and Litigation Risk

Variable	Dependent Variable = Count			
	(1)		(2)	
	Coeff. Est.	t-stat.	Coeff. Est.	t-stat.
Risk	0.93	5.00***		
Risk_Voluntary			1.08	5.04***
Risk_Mandatory			0.53	2.19**
Count_MDA	1.00	10.84***	0.98	10.63***
Forward_MDA	48.40	5.10***	47.26	4.98***
ScaledDisclosure	0.12	0.36	0.09	0.27
BigN	0.37	1.90*	0.42	2.18**
LogMVE	-0.05	-1.41	-0.05	-1.48
MTB	0.01	0.97	0.01	0.97
Delaware	0.24	1.60	0.25	1.65*
Restructure	-0.19	-1.80*	-0.15	-1.44
Segments	-0.19	-4.90***	-0.19	-4.92***
Year fixed effects	Yes		Yes	
Industry fixed effects	Yes		Yes	
Adj. R^2	0.96		0.96	
Observations	2,174		2,174	
p -value for Voluntary = Mandatory: Risk				0.04

NOTE: See Table 2 for variable definitions. The voluntary (mandatory) disclosure period is 1996–2004 (2005–2010). Industry fixed effects are based on the Fama French 48-industry classification. All reported p -values are two-tailed, clustering standard errors by firm. *, **, *** indicate statistical significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

firms with a Big N auditor provide significantly more risk factor discussion, but firms with more business segments provide significantly less.

Table 4 presents analogous results for boilerplate risk factor disclosure, measured using the *Resemblance* score. Consistent with H1b, the negative and significant coefficient estimate on *Risk* in Column (1) indicates that *High Risk* firms provide less boilerplate risk factor disclosure. In Column (2), we find that this result holds in the voluntary disclosure regime, as predicted in H3a. In the mandatory disclosure regime, however, the incremental effect of litigation risk on boilerplate disclosure is positive, although only marginally significant at the 0.10 level. This finding is counter to expectations, and suggests that *High Risk* firms provide somewhat more boilerplate language in the mandatory regime than *Low Risk* firms.

Because *Resemblance* measures the similarity in risk factor disclosures across two years, including the transition to the new regulatory mandate could result in spurious inferences as *Low Risk* firms were forced to substantially update their risk factor disclosures to comply (see Figure 2). The regulatory shift could thus cause a short-lived reduction in the *Resemblance* score postmandate for *Low Risk* firms that confound the analysis in Table 4. Therefore, we reestimate the second specification in Table 4 excluding the

Table 4: Association Between Boilerplate Risk Factor Disclosure and Litigation Risk

Variable	Dependent Variable = Resemblance			
	(1)		(2)	
	Coeff. Est.	t-stat.	Coeff. Est.	t-stat.
Risk	-0.06	-2.96***		
Risk_Voluntary			-0.11	-4.66***
Risk_Mandatory			0.05	1.79*
Resemblance_MDA	0.95	16.04***	0.97	16.48***
Forward_MDA	-7.31	-6.52***	-6.88	-6.25***
ScaledDisclosure	-0.02	-0.58	-0.01	-0.25
BigN	0.00	0.18	-0.01	-0.44
LogMVE	-0.00	-0.08	0.00	0.25
MTB	-0.00	-1.53	-0.00	-1.62
Delaware	-0.01	-0.82	-0.02	-0.90
Restructure	-0.01	-0.79	-0.02	-1.22
Segments	-0.01	-1.30	-0.01	-1.37
Year fixed effects	Yes		Yes	
Industry fixed effects	Yes		Yes	
Adj. R^2	0.87		0.88	
Observations	1,780		1,780	
p -value for Voluntary = Mandatory: Risk				< 0.01

NOTE: See Table 2 for variable definitions. The voluntary (mandatory) disclosure period is 1996–2004 (2005–2010). Industry fixed effects are based on the Fama French 48-industry classification. All reported p -values are two-tailed, clustering standard errors by firm. *, **, *** indicate statistical significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

transition period. Because some firms were slow in complying with the mandate, as seen in Figures 1–3, we exclude 2005 and 2006 observations from the estimation. Results from this untabulated sensitivity analysis reveal that the coefficient estimate on *Risk_Mandatory* is insignificant (t statistic = 0.57). However, the coefficient estimate on *Risk_Voluntary* remains significantly negative at the 0.01 level. Thus, the results suggest that after the transition to the mandatory disclosure regime, *High Risk* and *Low Risk* firms are similar in their use of boilerplate language in their risk factor disclosures, consistent with H3b.²⁴

Consistent with expectations, Table 4 also shows that firms with a tendency to “cut and paste” risk factor disclosure also do so with MD&A. However, when MD&A contains more forward-looking disclosure, firms update their risk factor disclosures more. This finding suggests that firms are aware of the litigation risk posed by their forward-looking

²⁴The transition to the mandatory regime is less likely to affect our tests for *Count* and *Fog* because they are measured using only the text for the current year. Nevertheless, we estimate the same sensitivity tests for these two disclosure measures with no change in inferences for either the voluntary or mandatory disclosure period. Thus, as expected, the *Resemblance* score is more sensitive to the effects of the regime shift.

Table 5: Association Between Readability of Risk Factor Disclosure and Litigation Risk

Variable	Dependent Variable = Fog			
	(1)		(2)	
	Coeff. Est.	t-stat.	Coeff. Est.	t-stat.
Risk	-1.11	-1.84*		
Risk_Voluntary			-1.34	-1.92**
Risk_Mandatory			-0.50	-0.58
Fog_MDA	0.61	3.94***	0.61	3.88***
Forward_MDA	-162.47	-4.24***	-160.27	-4.08***
ScaledDisclosure	-2.17	-2.55**	-2.12	-2.55**
BigN	-0.03	-0.05	-0.10	-0.16
LogMVE	0.10	0.64	0.11	0.68
MTB	0.00	0.12	0.00	0.12
Delaware	0.06	0.12	0.06	0.11
Restructure	-0.08	-0.21	-0.13	-0.31
Segments	0.17	0.84	0.17	0.84
Year fixed effects	Yes		Yes	
Industry fixed effects	Yes		Yes	
Adj. R^2	0.94		0.94	
Observations	2,049		2,049	
p -value for Voluntary = Mandatory: Risk				0.40

NOTE: See Table 2 for variable definitions. The voluntary (mandatory) disclosure period is 1996–2004 (2005–2010). Industry fixed effects are based on the Fama French 48-industry classification. All reported p -values are two-tailed, clustering standard errors by firm. *, **, *** indicate statistical significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

disclosures and avoid boilerplate warnings that are less likely to provide safe harbor protection.

We examine the readability of risk factor disclosures in Table 5. Consistent with H1c, the coefficient estimate on *Risk* is negative and significant at the 0.10 level, providing some evidence that *High Risk* firms use more readable language, on average, to describe risk factors. Allowing the coefficient estimate on *Risk* to vary with the disclosure regime in Column (2) reveals that the difference in the use of readable language is driven by *High Risk* firms in the voluntary disclosure period where the coefficient estimate on *Risk_Voluntary* is significant at the 0.05 level, consistent with H3a. The difference in the mandatory disclosure period is insignificant, suggesting, as in H3b, that *High Risk* and *Low Risk* firms provide similar disclosure in the postmandate regime. Findings for the control variables indicate that firms with more readable MD&A also provide more readable risk factor disclosures. Moreover, firms with more forward-looking information in their MD&A provide more readable risk factors, consistent with the incentives provided by the PSLRA’s safe harbor. Finally, when firms eligible for scaled disclosure requirements elect to disclose risk factors, they tend to use more readable language.

In summary, the findings in Tables 3–5 indicate that litigation risk provides a significant incentive for firms to disclose more meaningful risk factors (i.e., not only more

Table 6: Association Between Changes in Risk Factor Disclosure and Changes in Litigation Risk

Variable	Dependent Variable					
	$\Delta Count$		Resemblance		ΔFog	
	Coeff. Est.	t-stat.	Coeff. Est.	t-stat.	Coeff. Est.	t-stat.
IncRisk	4.20	1.67*	-0.43	-3.19***	-0.09	-0.03
DecRisk	2.53	0.75	0.39	2.20**	-2.50	-0.64
$\Delta Count_MDA$	0.15	7.27***				
Resemblance_MDA			0.93	16.49***		
ΔFog_MDA					0.66	4.07***
$\Delta Forward_MDA$	0.02	5.69***	-0.00	-2.26**	-0.01	-4.14***
ScaledDisclosure	-0.75	-1.54	-0.03	-1.27	-0.18	-0.32
BigN	-0.05	-0.13	-0.01	-0.42	-0.04	-0.10
LogMVE	0.25	3.68***	-0.00	-1.38	-0.01	-0.08
MTB	0.02	0.68	-0.00	-2.49***	-0.04	-1.07
Delaware	-0.02	-0.08	-0.04	-2.73***	0.18	0.56
Restructure	-0.28	-0.83	-0.02	-1.08	-0.21	-0.55
Segments	-0.16	-1.54	0.00	0.05	0.04	0.34
Year fixed effects	Yes		Yes		Yes	
Industry fixed effects	Yes		Yes		Yes	
Adj. R^2	0.21		0.88		0.01	
Observations	1,645		1,536		1,535	

NOTE: $\Delta Count$ is the natural log of the absolute value of 1 plus the change in the number of words in the risk factor disclosure; for firms with a decrease in disclosure, $\Delta Count$ is multiplied by -1 ; *Resemblance* is the Resemblance score; ΔFog is the change in the Fog score; $\Delta Count_MDA$, *Resemblance_MDA*, and ΔFog_MDA are calculated in an analogous fashion using MD&A, exclusive of any risk factor disclosure; *IncRisk* (*DecRisk*) is the change in the estimated probability of litigation for positive (negative) changes in litigation risk, and 0 otherwise; $\Delta Forward_MDA$ is the change in the ratio of forward-looking words in the firm's MD&A to the total number of words in MD&A. All other variables are defined in Table 2. To avoid the confounding effects of changes in disclosure associated with the risk factor disclosure mandate, we exclude the transition period from 2004–2006. Industry fixed effects are based on the Fama French 48-industry classification. All reported p -values are two-tailed. *, **, *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

disclosure but also disclosure that is less boilerplate and more readable). Firms that perceive little net benefit to disclosure (i.e., firms with low litigation risk) provide less meaningful disclosure on all three dimensions until disclosure was required by the SEC. Even then, firms at greater risk of litigation generally continue to provide significantly more meaningful risk factor disclosure, all else equal, suggesting that the mandate did not level disclosure practices completely. In other words, even in a mandatory disclosure regime, our results show that firm-specific litigation-related incentives influence risk factor disclosures.

We examine whether firms alter their risk factor disclosures in response to changes in litigation risk in Table 6. Focusing first on changes in the amount of disclosure, $\Delta Count$, we find that firms disclose significantly more risk factor information as litigation risk increases, but do not substantively change their risk factors in response to a

decrease in litigation risk.²⁵ As expected, untabulated findings further reveal that this result is driven by the *High Risk* firms where the coefficient estimate on *IncRisk* is positive and significant. In contrast, the coefficient estimate on *IncRisk* is insignificant for *Low Risk* firms. Thus, consistent with H2, we find that an increase in litigation risk, especially for firms already at a higher risk of being sued, is accompanied by an increase in risk factor disclosure.

The results for boilerplate disclosure in the middle columns of Table 6 reveal that firms significantly update their risk factor disclosures in response to either an increase or decrease in litigation risk, although the absolute magnitude of the coefficient estimate on *IncRisk* is significantly greater than that on *DecRisk*, as expected. Moreover, these findings are primarily driven by *High Risk* firms (untabulated). Taken together, this evidence supports H2.

Finally, in the right-most columns of Table 6 we find no evidence that changes in litigation risk are associated with changes in the readability of risk factor disclosures. However, across all three estimations in Table 6, we find that changes in the attributes of MD&A and risk factor disclosures tend to move in tandem. In addition, firms increase the quality of risk factor disclosure when they increase the amount of forward-looking disclosure in the MD&A ($\Delta Forward_MDA$).

In sum, although both disclosure and litigation risk tend to be “sticky” over time, we find evidence that is generally consistent with H2. These results not only support the conclusion that there is an association between litigation risk and risk factor disclosure, but also show that the response to changes in litigation risk is asymmetric. Firms improve the quality of their risk factor disclosures when litigation risk increases but generally do not reduce quality when litigation risk decreases.

Table 7 presents results for tests of the association between the amount of risk factor disclosure and the market’s assessment of future firm risk. Pooling across disclosure regimes, the findings reveal that *Count* is significantly positively associated with $Beta_{t+1}$ (Column (1)) and Std_AbRet_{t+1} (Column (3)) for *High Risk* firms only; there is no evidence of an association between risk factor disclosure and investors’ risk assessments for firms with low litigation risk.²⁶ These results support H4 and are consistent with the evidence presented above showing that firms at greater risk of litigation provide more meaningful risk factor disclosures.

Columns (2) and (4) of Table 7 present results allowing the coefficient estimate on *Count* to vary across the voluntary and mandatory disclosure regimes for *High Risk*

²⁵Untabulated descriptive statistics reveal that 895 (750) observations experienced an increase (decrease) in litigation risk. Mean (median) *IncRisk* is 0.029 (0.006) compared to mean (median) *DecRisk* of -0.026 (-0.006). On average, *High Risk* firms experience greater changes in litigation risk, both increases (mean *IncRisk* of 0.044) and decreases (mean *DecRisk* of -0.036) compared to *Low Risk* firms (mean *IncRisk* of 0.002 and *DecRisk* of -0.003).

²⁶Untabulated results indicate that the correlation is low between ex-ante litigation risk and either $Beta_{t+1}$ ($\rho = 0.24$) or Std_AbRet_{t+1} ($\rho = 0.10$). This can also be seen in our litigation risk model reported in the online appendix; these covariates are significantly associated with contemporaneous lawsuit filings in only two of the nine years in the voluntary disclosure period. Thus, there is no evidence of a mechanical association between litigation risk and either systematic or idiosyncratic firm risk.

Table 7: Risk Factor Disclosures and Future Market-Based Measures of Firm Risk

Variable	Dependent Variable = Beta				Dependent Variable = Std_AbRet			
	(1)		(2)		(3)		(4)	
	Coeff. Est.	t-stat.	Coeff. Est.	t-stat.	Coeff. Est.	t-stat.	Coeff. Est.	t-stat.
Count _{tHighRisk}	0.0388	3.51***			0.0011	2.60***		
Count _{tLowRisk}	0.0084	0.81			-0.0001	-0.15		
Count _{tHighRisk_Voluntary}			0.0461	3.83***			0.0009	2.13**
Count _{tHighRisk_Mandatory}			0.0152	1.10			0.0021	3.52***
Count _{tLowRisk_Voluntary}			-0.0047	-0.39			-0.0008	-1.79*
Count _{tLowRisk_Mandatory}			0.0122	0.87			0.0018	2.73***
Count_MDA	0.0572	1.60	0.0467	1.34	0.0036	2.56**	0.0034	2.49**
Forward_MDA	3.5891	1.22	3.0896	1.04	0.0645	0.72	0.0734	0.80
ScaledDisclosure	0.0088	0.15	-0.0077	-0.12	0.0080	2.29**	0.0085	2.43**
BigN	-0.0353	-0.73	-0.0079	-0.16	-0.0038	-1.99**	-0.0034	-1.73*
LogMVE	0.0329	2.83***	0.0317	2.68***	-0.0036	-7.70***	-0.0039	-8.01***
MTB	0.0143	3.58***	0.0145	3.72***	0.0002	1.10	0.0002	1.12
Delaware	0.0367	0.86	0.0407	0.93	-0.0009	-0.60	-0.0009	-0.60
Restructure	0.0291	0.70	0.0511	1.20	-0.0009	-0.71	-0.0003	-0.24
Segments	-0.0154	-1.07	-0.0152	-1.01	-0.0005	-1.02	-0.0004	-0.95
Beta _t	0.4517	13.36***	0.4304	12.42***				
Std_AbRet _t					0.5604	10.03***	0.5494	10.10
Year fixed effects	Yes		Yes		Yes		Yes	
Industry fixed effects	Yes		Yes		Yes		Yes	
Adj. R ²	0.80		0.80		0.86		0.86	
Observations	2,015		2,015		1,949		1,949	
<i>p</i> -value for Count _{tHighRisk} = Count _{tLowRisk} :								
Pooled	< 0.01				< 0.01			
Voluntary			< 0.01				< 0.01	
Mandatory			0.73				0.17	

NOTE: Count_{tHighRisk} (Count_{tLowRisk}) is the natural log of the number of words in the risk factor disclosure for *High Risk* (*Low Risk*) firms. All other variables are defined in Table 2. *Beta* and *Std_AbRet* are both measured over the 250 trading days beginning two days after the release of the 10-K. The voluntary (mandatory) disclosure period is 1996–2004 (2005–2010). Industry fixed effects are based on the Fama French 48-industry classification. All reported *p*-values are two-tailed, clustering standard errors by firm. *, **, *** indicate statistical significant at the 10 percent, 5 percent, and 1 percent levels, respectively.

and *Low Risk* firms. In the voluntary disclosure regime, the coefficient estimate on *Count_{tHighRisk}* is positive and significant for both measures of future firm risk. In contrast, the coefficient estimate on *Count_{tLowRisk}* is negative, with the result for idiosyncratic risk marginally significant at the 0.10 level. Further, the null hypothesis that the coefficient estimates for *High Risk* and *Low Risk* firms are equal is rejected at less than the 0.01 level. Thus, consistent with H4, *High Risk* firms provide significantly more informative risk factor disclosure in the voluntary disclosure regime.

In contrast, during the mandatory disclosure regime the coefficient estimates for *High Risk* and *Low Risk* firms are both positive but significant only in the *Std_AbRet_{t+1}*

regression. In both regressions, tests of coefficient differences between *High Risk* and *Low Risk* firms are insignificant at conventional levels. Thus, as with our previous tests, the evidence is consistent with a convergence in the meaningfulness of risk factors disclosed by *Low Risk* firms after the disclosure mandate.

In additional untabulated analysis, we estimate Equation (5) using either *Resemblance* or *Fog* as the risk factor disclosure attribute. Boilerplate or less readable risk factor disclosures may be less informative to investors about future firm risk. Consistent with this prediction, the coefficient estimate on these variables in the estimations in Columns (1) and (3) is negative and significant at the 0.01 level for *High Risk* firms but insignificant for *Low Risk* firms. However, the coefficient estimates are generally insignificant when we further partition by disclosure regime in Columns (2) and (4). Taken together, the evidence suggests that firms at higher risk of litigation risk provide more meaningful risk factor disclosures for investors' market risk assessments, particularly during the voluntary disclosure regime.

VII. SUMMARY AND CONCLUSION

We show that risk factors disclosure has steadily increased, both in absolute terms and as a proportion of MD&A, since Congress adopted the PSLRA in 1995, and continuing with the SEC's 2005 mandate. Risk factors now represent a substantial part of firms' annual securities filings. In addition to documenting this trend, we assess the effects of this shift from a voluntary incentive to a disclosure mandate.

Consistent with predictions, we find that prior to the SEC's 2005 mandate, firms with high securities litigation risk disclose more risk factors, revise their disclosure more from year to year, and use language that is easier to read. These findings are consistent with litigation risk providing an incentive for firms to voluntarily disclose risk factors that are more likely to be viewed as "meaningful" by the courts. With the advent of the SEC's mandate, these differences in disclosure largely disappear, as low-risk firms improve the quality of their risk factor disclosure, although firms at higher risk of litigation continue to provide more risk factor disclosure. We also find that firms are sensitive to changes in litigation risk, but that this sensitivity is asymmetric. Risk factor disclosures are more responsive to increases in litigation risk, particularly for firms already at greater risk of litigation.

Finally, we find that risk factor disclosures by firms at high risk of litigation are positively associated with postdisclosure measures of firm risk, consistent with investors incorporating this information into their risk assessments. For low-litigation-risk firms, the association is insignificant, suggesting that disclosures by these firms convey little useful information. This difference is pronounced in the voluntary disclosure regime, but like our other results largely converges subsequent to the SEC's mandate.

Overall, we conclude from the evidence presented in this article that firms with high litigation risk use risk factor disclosure in an effort to mitigate the expected costs of litigation. The SEC's introduction of a risk factor mandate induced substantial improvement in risk factor disclosure by firms at low risk of litigation. Nevertheless, the

incentive to provide meaningful risk factor disclosure provided by the PSLRA may continue to affect disclosure decisions and the usefulness of risk factor disclosure for investors, at least for firms at high risk of securities fraud class actions. This article contributes to our understanding of the roles of incentives and regulation in the evolution of narrative corporate disclosures, and its consequences for investors. The SEC's mandate in 2005 led to substantial convergence in risk factor disclosure, but scholars studying risk factor disclosure should be cognizant of the complementary role of legal incentives and regulatory mandates on disclosure decisions.

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