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The Effect of Risk Disclosures on the Pricing of Credit Default Swaps

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The Effect of Risk Factor Disclosures on the Pricing of Credit Default Swaps

Abstract

This study examines the relation between narrative risk disclosures in mandatory reports and the pricing of credit risk. In particular, we investigate whether and how the SEC mandate of risk factor disclosures (RFDs) affects credit default swap (CDS) spreads. Based on the theory of Duffie and Lando (2001), we predict and find that CDS spreads decrease significantly after RFDs are made available in 10-K/10-Q filings. These results suggest that RFDs improve information transparency about the firm's underlying risk, thereby reducing the information risk premium in CDS spreads. The content analysis further reveals that disclosures pertinent to financial and idiosyncratic risk are especially relevant to credit investors. In cross-sectional analyses, we document that RFDs are more useful for evaluating the business prospects and default risk of firms with greater information uncertainty/asymmetry. Overall, our findings imply that the SEC requirement for adding a risk factor section to periodic reports enhances the transparency of firm risk and facilitates credit investors in evaluating the credit quality of the firm.

Keywords: Risk factor disclosure; Mandatory reporting; Credit risk; Credit default swap

JEL Classification: M41; M48; G11; G32

1. Introduction

Duffie and Lando (2001) demonstrate that credit spreads consist of two distinct parts – the default risk component and the transparency or information risk component. Mandatory reporting, as a major source of public information, is an important determinant of the transparency component of credit spreads. However, prior studies have paid relatively little attention to whether and how qualitative disclosures in mandatory periodic reports affect the pricing of credit instruments. To fill this void, we exploit the regulatory mandate of risk factor disclosures (RFDs) in 10-K and 10-Q filings as a setting in which to examine the impact of narrative risk disclosures on the pricing of credit risk as captured by credit default swap (CDS) spreads.

Beginning in December 2005, the U.S. Securities and Exchange Commission (SEC) requires all registrants (except smaller reporting companies) to include in 10-K filings a separate section under Item 1A – Risk Factors to discuss "the most significant factors that make the company speculative or risky".[1] The SEC expects the inclusion of RFDs to enhance the content and transparency of corporate reporting, thereby allowing investors to make better-informed portfolio allocation decisions. Extant research on RFDs focuses mostly on equity markets (e.g., Kravet and Muslu 2013; Campbell, Chen, Dhaliwal, Lu, and Steele 2014; Hope, Hu, and Lu 2016). Overall, these studies show that RFDs are informative and useful to equity market participants for risk assessments. However, prior studies provide little evidence on the role of RFDs in the debt market in general and the credit derivative market in particular. As a result, little is known about the implications of RFDs for the pricing of credit instruments. To provide a more comprehensive

[1] Firms with less than $75 million in common equity public float or $50 million in annual revenue (if the public float cannot be determined) qualify as "smaller reporting companies." Same as with other disclosures and financial information, firms are required to provide an update in 10-Qs if there are material changes in risk factors from the previous filing. Although firms are mandated to provide RFDs in corporate filings, they have discretion over the disclosure content given that the SEC simply provides broad guidance on the risk disclosure requirements.

picture of the consequences of the SEC rule change in risk disclosure requirements, this paper addresses the impact of RFDs from the perspective of the credit market.

Although we have learned from prior research about the relevance of RFDs to equity market participants, the information role of RFDs in debt markets, particularly the CDS market, is unclear *ex ante*. First, different investors are likely to place differential weights on various risks described in RFDs, which in turn affects the pricing of certain risk. For example, credit investors may consider financial risk more seriously, while undiversifiable/systematic risk may concern equity investors more. Second, given the asymmetric loss function of debt holders, RFDs, as a source of conveying downside risk of the firm, should be more relevant for credit pricing than for equity pricing. In this sense, debt markets serve as a better context in which to examine the relevance of RFDs. Third, because credit stakeholders have a higher demand for negative information, they tend to engage more actively in gathering downside risk information. Unlike equity markets where smaller and less sophisticated investors are prevalent, institutions account for the vast majority of the trading in the CDS market. Considering that these institutional investors likely have access to private information via alternative channels, they might not rely (or rely to a lesser extent) on RFDs in periodic reports for risk assessments. Therefore, whether and how credit investors process RFDs in evaluating the firm's credit risk is ultimately an empirical question.

We use the CDS spread as a proxy for the pricing of credit risk because it provides a less noisy measure than the spreads of other debt instruments. Compared with bank loans and corporate bonds, CDS contracts are more homogeneous, standardized, and liquid. Because of these unique features of CDS contracts, CDS spreads provide a purer pricing of credit risk and reflect changes in credit risk more accurately and quickly than spreads of other debt instruments (Callen, Livnat,

and Segal 2009; Shivakumar, Urcan, Vasvari, and Zhang 2011; Griffin, Hong, and Kim 2016).[2] Therefore, the CDS market offers a relatively clean setting to test the theoretical link between corporate disclosure and credit pricing. If RFDs provide information that is incrementally useful for understanding the firm's financial condition to credit investors, we expect such information to improve the transparency about the overall credit quality of the firm, thereby lowering the transparency or information risk component of credit spreads.

Using a sample of 7,504 firm-quarter observations for the period of 2003 to 2007, we find that CDS spreads decrease after the firm follows the SEC requirement to include RFDs in 10-K/10-Q filings. Such evidence supports the SEC's view that the inclusion of a risk factor section in periodic reports improves the transparency of a firm's financial reporting and thus reduces investors' uncertainty about the firm's underlying risk. To obtain a better understanding about the effect of RFDs on credit pricing, we further examine the relation between changes in the RFD content and CDS spread changes. The content analysis shows that CDS spreads increase with the length of RFDs and the number of risk keywords in the disclosure. In addition, disclosures related to idiosyncratic and financial risk are more relevant for credit pricing than disclosures on other types of risk. In cross-sectional analyses, we find that the effect of RFDs on CDS spreads is more pronounced for firms with greater information uncertainty/asymmetry. This indicates that RFDs are more useful in helping credit investors evaluate the fundamental risk of the firm when the uncertainty about a firm's credit quality is higher. Taken together, these findings suggest that the SEC mandate of RFDs contributes to the reduction in the information uncertainty faced by credit

[2] CDS spreads can be viewed as a cleaner measure of the underlying credit risk than bond yield spreads. For example, CDS spreads do not reflect interest rate risk, currency risk, and other risk features that may relate to covenants, guarantees, and other credit terms in bond contracting (Griffin et al. 2016). Thus, examining the impact of RFDs in the context of CDS spreads provides a clearer inference on the role of RFDs in credit pricing than conducting in the context of, for instance, bond yield spreads. See Longstaff, Mithal, and Neis (2005) for detailed reasons why the CDS provides a superior measure of credit risk than corporate bonds.

investors, as reflected in decreased CDS spreads in the post-disclosure period.

To complement the analyses based on the level of CDS spreads, we also examine how the mandate of RFDs affects the volatility of CDS spreads. We document that the CDS volatility decreases from the pre- to the post-disclosure period, suggesting that RFDs help reduce heterogeneity in credit investors' beliefs and thereby decrease the CDS volatility. Consistent with the inferences drawn from primary analyses, these results also imply that the information asymmetry about credit risk reduces after RFDs are made available in corporate filings. To gain a deeper insight into the effect of changes in transparency about credit risk via the RFD mandate, we further test how it affects the CDS spread-maturity structure according to the theory of Duffie and Lando (2001). Their model predicts that an increase in accounting transparency not only reduces the intercept but also increases the slope and the concavity of the relation between credit spreads and maturity, up to a certain maturity. Consistently, we find that CDS spreads are lower across maturities and the slope and concavity of the CDS spread-maturity structure are higher after the RFD mandate. These results lend further support to the main findings that RFDs enhance the content and transparency of corporate filings and thus enable investors to better assess a firm's credit risk.

As RFDs might be repetitive over time, to capture the disclosure effect of the textual risk information that is new and incremental to the market, we compare the effects for: (1) firms that provide voluntary risk disclosures prior to the mandate versus those that do not; and (2) the first RFDs in 10-Ks provided by firms after the mandate versus those in subsequent 10-K/10-Q filings. We predict and show that RFDs have a greater impact on CDS spreads when there is a larger amount of new and incrementally useful information contained in the disclosures. These results allow us to make a stronger causal inference on the RFD and CDS spread relation, i.e., the decrease

in CDS spreads is driven by the incremental information content of RFDs, not vice versa. To alleviate concerns about potential problems of correlated omitted variables and reverse causality, we employ an event study methodology as well as a firm fixed effect regression, and obtain similar inferences. To further address such concerns, we perform the difference-in-differences (DiD) analysis using Canadian firms as the control sample. We also conduct a battery of robustness checks, including performing a placebo test, controlling for additional variables, using alternative measures of the CDS spread change, and dropping financial firms/voluntarily-disclosing firms. In general, our main results are robust to these sensitivity tests, reassuring that our findings are unlikely to be driven by some confounding factors that are not considered in the research design or by parallel trend. We employ a variety of research designs with an aim to disentangle the transparency effect from the default risk effect of RFDs on CDS spreads (e.g., by controlling for default risk and by performing several additional tests).[3] Admittedly, however, our tests have limitations with respect to this objective given that the proxy for default risk used as a control variable is not perfect.

Our paper contributes to the literature in several ways. First, it adds to the literature on the relation between corporate disclosure and the pricing of credit risk. Grounded on the theoretical underpinning derived from Duffie and Lando (2001), we exploit the SEC mandate of RFDs to provide large-sample, systematic evidence on how the changes in transparency about credit risk brought by the RFD mandate affect CDS spreads. Second, our study contributes to the literature on how investors use accounting information in the CDS market. As Griffin (2014) points out, the

[3] More specifically, the transparency effect refers to the effect of RFDs on improving the transparency of default risk and thus reducing the transparency component of CDS spreads, while the default risk effect refers to the effect of RFDs on changing investors' perceptions about default risk and thus affecting the default risk component of CDS spreads.

CDS market provides a unique setting in which to examine whether and how accounting disclosures influence investors' credit risk assessments.[4] Yet, accounting research in this area is relatively scarce. The results of our paper suggest that credit market participants utilize the information contained in RFDs in 10-K/10-Q filings when assessing the credit quality of the firm, which in turn affects the pricing of credit instruments. Third, to our knowledge, this is the first study that provides the credit market evidence on RFDs, complementing the extant RFD studies that focus exclusively on the equity market. Expanding research beyond the equity market allows us to obtain a full picture of the economic consequences of the RFD mandate and to provide policy implications for the SEC rule change in risk disclosure requirements. Lastly, we add to the growing literature that investigates the usefulness of qualitative corporate disclosures to capital markets by analyzing the impact of narrative risk factor disclosures in 10-Ks/10-Qs on CDS spreads. Unlike most of the existing studies that examine the relevance of quantitative disclosures, such as performance metrics, in the credit market (e.g., Callen et al. 2009; Shivakumar et al. 2011), our findings highlight the relative importance of qualitative versus quantitative disclosures in corporate filings in the pricing of credit risk.

The paper proceeds as follows. Section 2 discusses the institutional background, reviews the related literature, and develops the hypotheses. Section 3 describes the data and research methodology. Section 4 presents empirical results and discusses additional analyses. The final section concludes.

2. Institutional background, relevant literature, and hypotheses development

CDS relevant literature

[4] Griffin (2014, 848), "... the credit derivative market provides a new setting to examine how accounting information might affect investors' risk assessments ..."

The CDS, traded in the over-the-counter (OTC) market, is a contractual agreement to transfer the credit risk of a specific borrower (i.e., the reference entity) from protection buyers to protection sellers. The protection buyer pays a fixed premium (i.e., the spread) to the protection seller during the term of the CDS in return for compensation upon the designated credit events by a reference entity.[5]

Duffie and Lando (2001) develop a model that theorizes the role of accounting information in the pricing of credit risk. In their setting, all market participants are assumed to be equally informed and receive only periodic and imperfect accounting reports. Investors simply adjust their views about credit risk based on the precision of information available to them. The credit spread in their model is a function of the determinants of default risk in standard structural models and the imperfect information about the firm's asset dynamics from periodic accounting reports. They show that credit spreads are decreasing in the precision/transparency of accounting information, especially for credit instruments with short to medium maturities, suggesting that information risk is priced into credit spreads. Based on the theory developed by Duffie and Lando (2001), a number of papers empirically test the impact of accounting information on credit spreads (e.g., Yu 2005; Kraft 2015).[6] In general, the empirical findings corroborate Duffie and Lando's (2001) prediction.

Callen et al. (2009) investigate the role of earnings information in CDS pricing and find a negative relation between earnings and CDS spreads, suggesting that accounting earnings convey

[5] The events that trigger settlement under the CDS contract (i.e., credit events) include bankruptcy, failure to pay, debt restructuring, obligation default, obligation acceleration, and repudiation/moratorium (Markit Credit Derivatives Glossary 2011). If no credit event happens during the term of the CDS, the protection buyer continues to pay the premium until maturity.

[6] The notion of accounting information precision in the Duffie and Lando (2001) model is abstract, which can be interpreted as the degree of a firm's reporting transparency or the quality of accounting information perceived by investors. As a result, subsequent empirical studies employ various proxies to capture the concept of precision or transparency, such as the disclosure rankings issued by the Association for Investment Management and Research (AIMR) (Yu 2005), the information quality measure developed by Berger, Chen, and Li (2012) (Bajlum and Larsen 2008), financial statement comparability (Kim, Kraft, and Ryan 2013), asset reliability (Arora, Richardson, and Tuna 2014), rating agency adjustments (Kraft 2015), and internal control quality (Tang, Tian, and Yan 2015).

information about default risk. Consistently, Das, Hanouna, and Sarin (2009) and Correia, Richardson, and Tuna (2012) document the usefulness of accounting-based information in predicting credit spreads. Examining the relevance of earnings-related voluntary disclosures to credit markets, Shivakumar et al. (2011) find that management earnings forecast news is negatively associated with CDS spread changes and the credit market reacts more strongly to management forecasts than to earnings announcements.

A few recent studies analyze how regulatory changes in financial reporting, such as the implementation of IFRS, affect CDS pricing through potential changes in the transparency about credit risk. Bhat, Callen, and Segal (2014) find no significant change in the informativeness of accounting numbers for credit risk assessments after IFRS adoption. Focusing on the term structure of credit spreads, Bhat, Callen, and Segal (2016) show that CDS spreads decrease and the slope and concavity of the CDS curve increase subsequent to the adoption of IFRS, suggesting that implementing IFRS increases accounting transparency. In contrast, Kraft and Landsman (2017) report larger prediction errors of accounting-based models for CDS pricing after non-U.S. firms adopt IFRS.

Background of the RFD mandate and related research

On July 19, 2005, the SEC released a final rule that mandates registrants to include RFDs in 10-K filings and to provide updates reflecting material changes in 10-Q filings under Item 1A – Risk Factors, effective for filings submitted on or after December 1, 2005.[7] Firms are required to discuss in the risk factor section the most significant risks that may adversely affect the firm's

[7] See the SEC Release No. 33-8591, *Securities Offering Reform*. This rule applies to most SEC registrants, except for smaller reporting companies. Previously, firms were only required to provide RFDs in registration statements for public offerings.

business, operations, and financial position/performance. The SEC believes that the inclusion of a separate risk factor section in 10-K and 10-Q filings will assist market participants in making better-informed investment decisions. The risk factors described in Item 1A contain various types of risk faced by firms, including market/industry-wide, operating, financial/credit, legal, regulatory, and tax risk. As an example, in Appendix 1, we present the RFDs extracted from Item 1A of 10-Ks filed by various firms. As shown, the discussions are inherently relevant to the assessment of the firm's financial condition and liquidity, which determine the credit risk of the firm. The RFD mandate, as a recent regulatory change in mandatory financial reporting, thus offers a unique opportunity to explore the relation between qualitative disclosures and the pricing of credit risk. Moreover, the RFD requirement under this mandate, by its nature, applies to all SEC registrants (except smaller reporting companies). The use of the RFD mandate as a research setting thus reduces the possibility that the observed effect of RFDs is driven by some unobservable credit risk characteristics, thereby enabling us to make a clearer inference on the disclosure effect of RFDs on CDS spreads.

Critics, however, contend that RFDs might not be as useful as the SEC expects. Given that the new risk disclosure rule does not require firms to estimate the likelihood of the realization of a certain risk or to quantify the potential impact on their operations and financial conditions, firms may simply disclose all the possible risks and uncertainties surrounding them in a vague and boilerplate way.[8] Practitioners also question the necessity of a separate risk factor section because some companies have already included risk-related discussions in various sections of their filings.

[8] Anecdotal evidence suggests that poor risk disclosures could lead investors to suffer from substantial losses (Malone 2005). Take Lehman Brothers' RFDs in its 2007 10-K for instance, Kaplan (2011) comments that "Does this sound like the risk exposure of a huge financial institution that would file for bankruptcy less than two months after this 10-K submission?" Consequently, the SEC has renewed its attention to risk disclosures in the light of the recent financial crisis and increased scrutiny of the specificity of firms' disclosed risk factors during the filing review process.

Recent studies respond to the debate on the RFD usefulness by examining the information content of RFDs to see whether such disclosures are used by equity market participants. Campbell et al. (2014) find that RFDs increase beta and return volatility but reduce bid-ask spreads, implying that equity investors take the information contained in RFDs into account when assessing firm risk. Hope et al. (2016) measure the level of specificity of RFDs and document that the market reaction to 10-K filings is greater for firms with more specific RFDs, indicating that RFDs with a higher level of specificity benefit financial statement users more. Similarly, Kravet and Muslu (2013) find that textual risk disclosures in the whole 10-K are associated with return volatility, trading volume, and forecast volatility, suggesting that such disclosures increase investors' risk perceptions. Overall, these papers provide evidence that RFDs are informative to equity market participants, helping them better understand the fundamental risk of the firm.

Hypotheses development

As discussed above, the SEC mandate of RFDs affords a research setting in which to examine the relation between qualitative disclosures in 10-Ks/10-Qs and the pricing of credit risk. The theory of Duffie and Lando (2001) implies that more transparent or precise accounting disclosures help reduce credit stakeholders' uncertainty about the underlying risk of the firm. This in turn lowers the information risk premium in the cost of debt (Bharath, Sunder, and Sunder 2008; Kim, Song, and Zhang 2011). Prior research has documented the relation between mandatory or voluntary disclosures of earnings information and CDS spreads (e.g., Callen et al. 2009; Shivakumar et al. 2011). Yet, there is little evidence on whether qualitative corporate disclosures are incrementally useful beyond the information provided by quantitative disclosures, such as reported earnings, in the pricing of credit risk. In an attempt to fill this void in the literature, our study aims to examine the incremental effect of qualitative disclosures under the RFD mandate on

the pricing of CDS instruments over and above quantitative disclosures in corporate filings.

Although previous studies (e.g., Campbell et al. 2014; Hope et al. 2016) have provided evidence supporting the relevance of RFDs to equity market participants, the information role of RFDs in debt markets has not been well explored so far. It is unclear, *a priori*, whether information disclosed via the RFD mandate is of similar relevance to debt market participants as it is to equity market participants. As mentioned earlier, RFDs in fact contain information about various types of risk. Different investors are expected to use and process this information in a way that serves their best interests, and thus price various risks differentially. For instance, credit investors probably put a greater weight on financial risk, while equity investors would be more concerned about undiversifiable risk (i.e., systematic or market risk). In addition, the payoff functions of credit and equity investors as well as the investor characteristics of debt and equity markets are fundamentally different. Credit investors are typically more sensitive to downside risk because of the put-option-like payoff structure of debt, whereas equity investors are more interested in upside potential (Watts 2003; Kothari, Ramanna, and Skinner 2010).[9] Consistent with this argument, DeFond and Zhang (2014) show that bond prices impound bad news more quickly than good news and incorporate bad news earlier than do stock prices. Given that RFDs per se are disclosures on downside risk, they would be more relevant for credit pricing than for equity pricing.

On the other hand, because credit stakeholders, including CDS investors, are rather keen on obtaining negative/unfavorable information, they tend to engage more actively in information gathering activities to learn about factors associated with potential downside risk of the firm.[10]

[9] The payoff function of debt securities limits upside potential to investors who have fixed claims against the borrowing firm, which generates an asymmetric demand for negative information by credit investors.
[10] De Franco, Vasvari, and Wittenberg-Moerman (2009) document a greater demand for negative information by bond investors relative to equity investors.

Unlike the equity market, the CDS market is dominated by sophisticated and well-informed institutional investors, and these investors are likely to have privileged access to private information via alternative channels, for example, through their close connections/cooperation with large financial institutions (Acharya and Johnson 2007). In this environment, it is possible that qualitative information contained in RFDs may not play a significant role in CDS pricing. Given the two opposing predictions on the role of RFDs in the pricing of credit instruments, it is unclear, *a priori*, whether RFDs in periodic reports provide incrementally useful information to credit market participants, making it ultimately an empirical question.

Because RFDs mainly provide information about the factors that have materially adverse impacts on the financial condition of the firm, such information is expected to help CDS investors assess the reference entity's credit risk more precisely. If this information is incrementally useful to CDS investors, through the transparency channel proposed by Duffie and Lando (2001), it will decrease CDS spreads, other things being equal. Nevertheless, the information about downside risk disclosed via RFDs could potentially increase the level of risk perceived by credit investors.[11] In this case, RFDs may increase the demand for credit insurance against default, thereby increasing the default risk component of credit spreads. This would in turn lead to higher CDS spreads in the post-disclosure period, even though such disclosures improve the transparency about the default risk of the firm. From the above discussion, whether the RFD mandate decreases or increases CDS spreads is unclear *ex ante*, and thus is worthy of empirical investigation. To provide evidence on this unresolved issue, we propose and test the following hypothesis (stated in alternative form):

HYPOTHESIS 1. *All else being equal, there is a decrease in CDS spreads after the reference*

[11] As documented by prior studies (e.g., Campbell et al. 2014), RFDs may increase equity investors' risk perceptions, implying negative revisions in their risk assessments following the disclosure. However, such revisions could be positive if the firm discloses that certain risk factors have been alleviated during the reporting period, leading to positive revisions of risk expectations by investors.

entities are mandated to provide RFDs in corporate filings with the SEC.

H1 would be supported to the extent that the effect of RFDs on increasing corporate transparency (and thus reducing the transparency component of credit spread) dominates the possible effect of RFDs on increasing the perception of default risk, while it would not be supported if the former effect is dominated by the latter effect.

In order to strengthen the confidence in attributing the change in CDS spreads, if any, to the improved transparency about credit risk by RFDs, we further explore whether such a relation varies across firms with different information environments. Prior studies suggest that the market response to corporate disclosures differs with the level of information uncertainty. Lang (1991) presents a model showing that earnings are more informative to investors when the uncertainty about the firm's future prospects is higher. Sengupta (1998) documents that firms with better disclosure quality enjoy a lower cost of debt, especially for firms with greater information uncertainty. Similarly, in the context of CDS pricing, Shivakumar et al. (2011) find that the CDS market reacts to management forecasts more strongly during the period of high information uncertainty.

When the firm's underlying fundamentals are volatile or complex, it is difficult for market participants to assess the value or future prospects of the firm precisely, which may result in higher information risk premium in the cost of capital. In line with this argument, Bharath et al. (2008), Wittenberg-Moerman (2009), and Kim et al. (2011), among others, find that the loan interest rate increases with the information asymmetry associated with the borrowing firm, suggesting that information uncertainty or opacity is priced into the cost of debt. When the level of information uncertainty is high, RFDs are likely to be more useful to credit investors in helping them better evaluate the credit quality of the firm. We thus expect that the transparency effect of RFDs on

CDS spreads, if any, would be more pronounced when there is greater uncertainty about the underlying credit risk of the reference entity. This leads to our second hypothesis, stated in alternative form:

> HYPOTHESIS 2. *All else being equal, the effect of the RFD mandate on CDS spreads is greater for reference entities with high information uncertainty than for those with low information uncertainty.*

3. Data and methodology

Sample and data

We obtain the CDS data for the period of 2003 to 2007 from the Markit CDS database. Markit is one of the largest providers of CDS data. Many accounting and finance studies (e.g., Jorion and Zhang 2007, 2009; Shivakumar et al. 2011; Qiu and Yu 2012; Kim et al. 2013; Arora et al. 2014) have used the CDS data from Markit. The composite CDS spreads in the database are based on daily closing bid and ask prices from market makers' official books and records at the end of each trading day. By removing outliers and stale observations, Markit achieves high data quality and the CDS contracts included in its database are sufficiently liquid to provide reliable daily closing prices. Besides CDS spreads, the Markit database also contains information about the seniority and currency of the underlying debt, the maturity of the CDS contract, the restructuring clause applied in the contract, and the CDS implied rating. Following prior studies (e.g., Jorion and Zhang 2007), we only retain CDS contracts with modified restructuring clauses.

To maintain the homogeneity of the CDS contracts in our sample, we keep only 5-year U.S. dollar-denominated CDS contracts with modified restructuring clauses for senior unsecured debts. Consistent with previous studies (e.g., Shivakumar et al. 2011; Bhat et al. 2014), we choose 5-year CDS contracts because they are the most common and liquid contracts and have the best coverage

in the database.[12] We then merge the Compustat quarterly file with the CDS dataset. After eliminating observations without corresponding GVKEYs and the necessary data to construct major regression variables, we are left with 7,824 firm-quarter observations of 621 firms. To ensure that the composition of sample firms is constant in the pre- and post-disclosure periods, we require each firm to have at least one observation before and after the compliance with the RFD mandate. As a result, our sample consists of 7,504 firm-quarter observations of 535 firms.

Panels A and B of Table 1 present the sample distribution by year and industry, respectively. As shown, the sample observations are evenly distributed across the periods before and after the mandate of RFDs, with 3,570 firm-quarters in the pre-disclosure period and 3,934 in the post-disclosure period. Over half of the sample firms operate in manufacturing and finance, insurance, and real estate industries, comparable to the sample distribution of the Compustat universe during the same period.[13]

Empirical design

To investigate the impact of the SEC mandate of RFDs on CDS spreads (H1), we estimate the following regression model:

$$SPRD_{it} = \alpha_0 + \alpha_1 MAN_{it} + \alpha_2 ROA_{it} + \alpha_3 LEV_{it} + \alpha_4 SPOT_{it} + \alpha_5 STDRET_{it} + \alpha_6 RATE_{it} + \alpha_7 SIZE_{it} + \alpha_8 DRISK_{it} + \alpha_9 ILLIQUID_{it} + \alpha_{10} Lagged\ SPRD_{it} + \sum YEAR + \sum IND + \varepsilon_{it} \quad (1)$$

The dependent variable, *SPRD*, is the natural logarithm of the CDS spread (in basis points) on the first trading day after the SEC filing date of the current quarter (Callen et al. 2009).[14] The main test variable, *MAN*, is an indicator variable that equals one after the firm complies with the SEC

[12] See Kraft and Landsman (2017) for a detailed description of the features of CDS contracts.
[13] During the period from 2003 to 2007, firms in manufacturing and finance, insurance, and real estate industries account for 31.53 percent and 26.27 percent of the Compustat quarterly universe, respectively.
[14] If the SEC filing date is missing, we use the 45th day after the end of the fiscal quarter as the filing date. Results are unchanged if these observations are dropped.

mandate to include the risk factor section (Item 1A – Risk Factors) in 10-K/10-Q filings, and zero otherwise. As this rule became effective for the first 10-K filing submitted on or after December 1, 2005 and subsequent 10-Q/10-K filings, there is a slight variation in firms' actual adoption timing, depending on when their fiscal periods end. Therefore, instead of using a specific calendar date to partition the sample period into the pre- and post-disclosure periods, we code the variable *MAN* based on which 10-K filing contains the risk factor section for the first time after the mandate. Specifically, *MAN* is set equal to zero for firm-quarters before the first 10-K filing that includes Item 1A, and one otherwise.

Based on prior literature (e.g., Collin-Dufresne, Goldstein, and Martin 2001; Callen et al. 2009), we include a variety of control variables that are potentially associated with CDS spreads. We control for the determinants of credit spreads implied by structural models, including leverage (*LEV*), risk-free rate of interest (*SPOT*), and stock return volatility (*STDRET*) (Merton 1974). Following Callen et al. (2009), we also control for profitability (*ROA*), credit rating (*RATE*), and firm size (*SIZE*). To control for the influence of default risk on CDS spreads, we incorporate a market-based measure of default risk (*DRISK*) into our model.[15] Further, as noted by previous studies (e.g., Qiu and Yu 2012; Gehde-Trapp, Gündüz, and Nasev 2015), liquidity is priced into CDS premiums and endogenous to other determinants of CDS spreads. To address this issue, we follow Bhat et al. (2016) to use the residual from the regression of the log of the bid-ask spread on firm size, stock return volatility, credit rating, and leverage as a proxy for liquidity (*ILLIQUID*) and include it in our model as a control variable. We also control for the lagged value of the dependent variable (*Lagged SPRD*) in an attempt to capture the impact of RFD mandate on the

[15] The measure of the probability of default used in our paper is calculated based on the Black-Scholes-Merton model. As demonstrated by Hillegeist, Keating, Cram, and Lundstedt (2004), this measure outperforms other accounting-based measures, such as Altman's Z-score and Ohlson's O-score, in predicting default.

change in CDS spreads. Finally, we include year and industry fixed effects to control for the potential inter-temporal and cross-industry variations in CDS spreads. Appendix 2 provides detailed definitions of the variables used in our empirical analyses.

Next, we examine whether the effect of RFDs on CDS spreads varies with the level of information uncertainty (H2) by incorporating a conditioning variable (*COND*) measuring the information uncertainty and its interaction term with *MAN* into the regression model. We expect the information uncertainty to be greater when the firm's underlying fundamentals are volatile or when the business operations are complex. Following Zhang (2006), we use analysts' forecast dispersion (*FDISP*) to capture the information uncertainty resulting from the volatility of the firm's fundamentals. To capture the complexity of a firm's business operations, we use the number of business segments that a firm has in different industries (*SEG*) as a proxy.[16] We further consider the number of quote contributors for the daily CDS spreads in the Markit database (*CDS DEPTH*) as an alternative measure. When there are fewer dealers providing the quotes, the information uncertainty about firm risk is expected to be greater. Specifically, we code the conditioning variable, *FDISP* or *SEG* (*CDS DEPTH*), as one if the firm's analysts' forecast dispersion or the number of business segments in different 3-digit SIC industries (the number of quote contributors for the firm's CDS contract) is above (below) the sample median, and zero otherwise.

4. Empirical Results

Univariate analysis

Table 2 reports descriptive statistics of major variables used in our empirical analyses. To

[16] Our motive of using the number of business segments is to capture the information uncertainty resulting from the complexity of business operations although corporate diversification, on the other hand, can reduce systematic risk through coinsurance among a firm's business segments (Hann, Ogneva, and Ozbas 2013). We thank the reviewer for pointing this out.

mitigate the influence of outliers, we winsorize all continuous variables at the top and bottom one percentile. As shown, CDS spreads are significantly lower after firms follow the SEC requirement to include the risk factor section in periodic reports. Consistent with the direction of CDS spread changes implied by structural models, risk-free interest rate increases and leverage decreases from the pre- to the post-disclosure period. In line with the trend of the aforementioned determinants of credit spreads, return on assets, firm size, and liquidity also increase from the pre- to the post-disclosure period. On the other hand, compared with the pre-disclosure period, firms have more volatile stock returns, lower credit ratings, and higher default risk in the post-disclosure period.

Main results

We present results for the test of the relation between CDS spreads and the RFD mandate in Table 3. The significance of the coefficients is based on robust standard errors corrected for firm-level clustering. Panel A of Table 3 reports the results for the regression model specified in Eq. (1).[17] The coefficient on the variable of interest, *MAN*, is negative and significant (-0.091, p-value < 1%), indicating that CDS spreads decrease from the pre- to the post-disclosure period after controlling for all other factors that are known to affect credit spreads. In terms of the economic impact, a decrease of 0.091 from the pre- to the post-disclosure period represents a reduction of 8.7% in CDS spreads.[18] Consistent with the prior literature, we find that CDS spreads decrease with profitability, risk-free rate of interest, and firm size and increase with leverage, stock return volatility, poor credit rating, default risk, and illiquidity.

We alternatively use the change regression model to mitigate the concern about correlated

[17] In unreported analyses, we rerun the regression by including the terms interacting *MAN* with each of the control variables and find fairly consistent results.

[18] $e^{-0.091}$-1=-0.08698. Note that the dependent variable here is log-transformed.

omitted variables, where we take a change form of all dependent and independent variables except the test variable *MAN*.[19] We choose not to use a change form of *MAN* because it would only capture the RFD effect on credit pricing when firms add the risk factor section to 10-Ks for the first time after the mandate. Considering that RFDs in the subsequent filings may also deliver incrementally useful information to credit investors, we are interested in the overall effect of RFDs rather than merely the impact of the first-time disclosure.[20] As reported in panel B of Table 3, the results under the change model are qualitatively similar to those under the level model. The coefficient on *MAN* remains significantly negative (-0.175, p-value < 1%). Compared with the pre-disclosure period, CDS spreads become lower by 17.5% in the post-disclosure period, which is economically significant. The estimated coefficients on the control variables have the predicted sign in general, except that the coefficient on ΔLEV is negative but insignificant. Since we control for the change in stock return volatility and default risk, which to some extent captures the change in investors' risk assessments following the disclosure, the coefficient on *MAN* reflects the transparency effect resulting from the SEC mandate of RFDs.

Overall, the results of Table 3 support H1, suggesting that RFDs are incrementally useful to credit investors in helping them better understand the downside risk of the firm and thereby reduce their uncertainty about the underlying credit risk as reflected in decreased CDS spreads. In the following analyses, we focus on the change specification because it is superior to the level specification in mitigating concerns about correlated omitted variables and potential reverse causality (Bradshaw, Bushee, and Miller 2004; Li 2010).

[19] Following previous studies (e.g., Callen et al. 2009; Shivakumar et al. 2011), we separate the change in credit ratings into positive and negative components (*POSRATE* and *NEGRATE*) because positive rating changes have different implications for credit risk from negative rating changes.

[20] Consistent with our arguments, the results in panel B of Table 8 indicate that while the first-time disclosure has a larger effect, RFDs in subsequent 10-K/10-Q filings are relevant to the credit market as well. As a robustness check, we run an alternative change regression using a change form of *MAN* and obtain qualitatively similar results.

To gain deeper insights into the usefulness of RFDs to debt market participants, we further look into the textual contents of RFDs and examine how changes in the disclosure contents are associated with changes in CDS spreads. To conduct this content analysis, we download 10-Ks of fiscal years 2005-2009 from the SEC's Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database and use the Python programming language to parse and extract Item 1A – Risk Factors. Following Campbell et al. (2014), we quantify the content of RFDs by counting the number of total words in the risk factor section and the number of risk keywords within the section.[21] We also classify the risk keywords into five categories based on the types of risk, including those related to systematic risk, idiosyncratic risk, financial risk, litigation risk, and tax risk.

Table 4 presents the results of the RFD content analysis.[22] Consistent with the equity market evidence provided by Campbell et al. (2014), Columns (1) and (2) show that CDS spreads increase with the length of RFDs *(LENGTH1A*) and the number of risk keywords in the disclosures (*RWORD1A*), suggesting that credit investors incorporate the textual risk information contained in RFDs into CDS pricing. As credit market participants probably can infer macroeconomic and industry-related risks from other sources, we expect firm-specific (i.e., idiosyncratic) risk disclosures (*RWORD1A_IDIO*) to matter more than market-wide (i.e., systematic) risk disclosures (*RWORD1A_SYS*).[23] In addition, we anticipate that financial risk disclosures (*RWORD1A_FIN*) are more relevant in the credit market than disclosures related to other types of risk, such as

[21] For the list of risk keywords, see Appendix 3 in Campbell et al. (2014).
[22] In this analysis, we further control for the length of the 10-K report (*LENGTH10K*), considering the correlation between RFDs and other disclosures in the 10-K.
[23] Systematic risk would be more important to equity investors given that such risk cannot be diversified away. Campbell et al. (2014) provide supporting evidence that systematic risk disclosures (measured as the amount of keywords in RFDs referring to systematic risk) are positively associated with post-disclosure market beta. However, systematic risk disclosures might be less of a concern in the context of the credit market.

litigation risk disclosures (*RWORD1A_LIT*) and tax risk disclosures (*RWORD1A_TAX*). In Column (3) of Table 4, we document a positive association between CDS spread changes and changes in the amount of RFDs referring to idiosyncratic and financial risk, which is in line with our prediction. The finding that credit spreads also price idiosyncratic risk information is consistent with Merton's (1987) prediction of a positive relation between idiosyncratic risk and expected returns when investors hold sub-optimally diversified portfolios. Overall, these results further support the inference that RFDs contain incrementally useful information that is priced into CDS spreads by credit investors.[24]

Table 5 reports results for the test of H2, exploring how the effect of RFDs on CDS spreads varies with the level of information uncertainty. We use three different measures of information uncertainty as the conditioning variable (*COND*): analysts' forecast dispersion (*FDISP*), the number of business segments (*SEG*), or the number of CDS quote contributors (*CDS DEPTH*). The results for each of these proxies are presented in Columns (1) – (3), respectively. We observe a negative and significant coefficient on *MAN*×*FDISP* (-0.030, p-value < 10%) in Column (1) using the dispersion in analyst forecasts to capture the information uncertainty. We also obtain consistent results in Column (2) that the coefficient on *MAN*×*SEG* is negative and significant (-0.024, p-value < 10%) when the complexity of business operations (*SEG*) is the conditioning variable. In Column (3), we use *CDS DEPTH* to measure the information asymmetry and again find a significantly negative coefficient on *MAN*×*CDS DEPTH* (-0.045, p-value < 1%). Meanwhile, the coefficient on *MAN* is significantly negative across all three columns and the control variables

[24] To isolate the effect of transparency about default risk brought by RFDs, we perform a cross-sectional analysis based on the quality of RFDs, where the RFD quality is measured by the number of SEC comment letters issued on RFDs or the average of the Fog index of RFDs in 10-Ks of fiscal years 2005-2009. As expected, the unreported results indicate that the effect of RFDs on reducing CDS spreads is more pronounced for firms with RFDs of better quality.

exhibit patterns similar to those reported in Table 3. Together, these findings suggest that RFDs have a more pronounced effect on reducing the information risk premium in CDS spreads when the firm's underlying fundamentals are more volatile, when the business operations are more complex, or when the information asymmetry about default risk is higher. This is consistent with H2 that the impact of RFDs on CDS pricing is stronger for firms with greater information uncertainty.

Collectively, we find that CDS spreads decrease after RFDs are made available in 10-K and 10-Q reports, implying that the regulatory change in risk factor disclosure requirements improves the information transparency regarding a firm's underlying risk and thus reduces CDS investors' uncertainty about the credit quality of the reference entity. In addition, the disclosures pertinent to idiosyncratic and financial risk are particularly relevant to credit investors. Cross-sectional analyses in Table 5 suggest that RFDs are especially useful to credit investors when firms have a higher level of information uncertainty. This cross-sectional evidence further corroborates the results in the main test, mitigating the possibility that our findings are attributable to other confounding factors.

Additional analyses

Impact on CDS volatility

The results of our primary analyses suggest that the information asymmetry about a firm's credit quality has decreased after RFDs are made available in periodic reports, leading to a decrease in CDS spreads. To provide further evidence on the effect of RFDs on reducing the information asymmetry regarding the credit risk of the firm, we investigate whether the RFD mandate affects the volatility of CDS spreads in addition to the level of the spread. If RFDs indeed provide credit investors with useful information to assess the default risk of the reference entity, we expect RFDs

to reduce not only the information asymmetry about default risk but also the heterogeneity in credit investors' beliefs regarding default risk. Accordingly, using the volatility of CDS spreads as a proxy for the information uncertainty about the underlying default risk, we predict that the volatility would decrease following the RFD mandate. We measure the CDS volatility as the standard deviation of CDS spreads from the first day after the SEC filing date of the current quarter to the first day after the SEC filing date of the next quarter. Panels A and B of Table 6 report the results of the CDS volatility analysis using the level and the change specification, respectively. In both panels, we find a significantly negative coefficient on *MAN*, indicating that the volatility of CDS spreads decreases from the pre- to the post-disclosure period. Consistent with the inferences drawn from our primary analyses, these results imply that RFDs reduce heterogeneity in credit investors' beliefs and information asymmetries about default risk, and thus decrease the CDS volatility.

Impact on the spread-maturity relation of CDS instruments

In this section, we further analyze how the RFD mandate affects the CDS spread-maturity structure. As Duffie and Lando (2001) demonstrate, the relation between CDS spreads and their maturity structure depends directly on the precision (or transparency) of periodic accounting reports. When accounting precision/transparency is improved, credit investors are more capable of assessing the firm's likelihood of bankruptcy from periodic accounting reports, resulting in a decrease in spreads for CDS contracts of all maturities (as the main findings we document earlier). Moreover, the sensitivity of CDS spreads to changes in maturity increases with the transparency of default risk because, with greater information transparency regarding the firm's asset values, investors are better able to evaluate how a change in maturity affects the probability of a credit event occurrence and how much impact this credit event has on the asset values of the firm. CDS

spreads thus become more sensitive to changes in maturity as credit investors' beliefs regarding the effect of a credit event are more likely to be modified over time. Although the sensitivity of CDS spreads to changes in maturity is higher when accounting transparency is improved, the change in this sensitivity is less for CDS contracts of longer maturities than for those of shorter maturities. This is because imperfect accounting information on the asset values of the firm is less informative about distant credit events than near-term credit events, which causes the changes in accounting transparency to have a smaller impact on the changes in spreads for CDS instruments of longer maturities. Consistent with the above intuitions, the Duffie and Lando model yields three specific predictions regarding how changes in accounting transparency influence the spread-maturity relation of CDS instruments. That is, increases in accounting transparency would reduce the intercept as well as increase the slope and concavity of the CDS spread-maturity structure.[25]

To test the effect of changes in transparency about default risk via the RFD mandate on the CDS spread-maturity relation, we expand our sample to include CDS contracts of different maturities and estimate the following regression model:

$$\begin{aligned} SPRD_{it} = {} & \alpha_0 + \alpha_1 MAN_{it} + \alpha_2 MATURITY_{it} + \alpha_3 MAN_{it} \times MATURITY_{it} + \alpha_4 MATURITY^2_{it} \\ & + \alpha_5 MAN_{it} \times MATURITY^2_{it} + \alpha_6 ROA_{it} + \alpha_7 LEV_{it} + \alpha_8 SPOT_{it} + \alpha_9 STDRET_{it} \\ & + \alpha_{10} RATE_{it} + \alpha_{11} SIZE_{it} + \alpha_{12} DRISK_{it} + \alpha_{13} ILLIQUID_{it} + \sum YEAR + \sum IND + \varepsilon_{it} \end{aligned} \quad (2)$$

where all variables are as previously defined.

Columns (1) and (2) of Table 7 present the results using CDS contracts of all maturities. Reported standard errors are corrected for double (firm and year) clustering. Consistent with the term structure of credit spreads, the results of the baseline model in Column (1) show that the coefficients on *MATURITY* and $MATURITY^2$ are positive and negative, respectively, and are

[25] Figure 8 in Duffie and Lando (2001) shows how the relation between the credit spread and maturity varies with different levels of accounting precision, which corresponds to these predictions.

highly significant at less than the 1% level, suggesting an inverted U-shaped relation between CDS spread and maturity. In Column (2), we add our test variable (*MAN*) and its interaction terms with maturity (*MAN*×*MATURITY*) and maturity squared (*MAN*×*MATURITY*^{2}). Consistent with the predictions of how increased transparency affects the term structure of credit spreads that we discuss earlier, we find that the coefficients on *MAN*, *MAN*×*MATURITY*, and *MAN*×*MATURITY*^{2} are significantly negative, positive, and negative, respectively. These results indicate that CDS spreads are lower across all maturities, and the slope and concavity of the CDS spread-maturity relation are higher, after RFDs are made available in firms' periodic reports. The significantly negative coefficient on *MAN* here is in line with the findings of our primary analyses using 5-year CDS contracts, suggesting that our main results are not biased by the choice of a fixed maturity CDS instrument.

We further restrict the sample to CDS contracts with maturities of five years or less, because in the Duffie and Lando (2001) model, accounting transparency plays a more important role in the spread-maturity structure of CDS instruments with relatively short-term maturities. As shown in Columns (3) and (4) of Table 7, results are robust using CDS contracts of shorter maturities. Overall, these findings lend further support to the inferences derived from our primary analyses that the inclusion of RFDs in corporate filings improves the transparency of financial reporting and helps reduce investors' uncertainty regarding the underlying risk of the firm, thereby decreasing the information risk premium in CDS spreads.

Magnitude of new information contained in RFDs

Before the SEC requirement to include RFDs in 10-K/10-Q filings, some firms have voluntarily disclosed such information considering the potential legal protection it offers (hereafter voluntarily-disclosing firms). Hence, relative to firms that start to provide RFDs after the mandate

(hereafter non-voluntarily-disclosing firms), the newly-created risk factor section of those voluntarily-disclosing firms might contain less new information to the market. We thus expect the impact of the RFD mandate on CDS spreads to be stronger for non-voluntarily-disclosing firms than for voluntarily-disclosing firms. To test this argument, we include an indicator variable *NONVOL* and the interaction term *MAN*×*NONVOL* in the regression model.[26] *NONVOL* is set equal to one if the firm does not provide voluntary risk disclosures in 10-Ks before the SEC mandate, and zero otherwise. To code this variable, we manually check each sample firm's most recent 10-K prior to its first 10-K filing that includes the risk factor section as mandated by the SEC and determine whether its prior 10-K filing contains voluntary RFDs.

Panel A of Table 8 presents the results for this additional analysis. Consistent with our prediction, we find that the coefficient on *MAN*×*NONVOL* is negative and significant, indicating that non-voluntarily-disclosing firms experience a larger decrease in CDS spreads after complying with the RFD mandate than do voluntarily-disclosing firms. This is in line with our conjecture that RFDs provided by non-voluntarily-disclosing firms contain more new and incrementally useful information to the market.

Next, we analyze the magnitude of information in RFDs by comparing the credit market response to the first-time disclosure versus the subsequent disclosures. We expect that the first RFDs provided by firms after the mandate generate a stronger response from the CDS market than the RFDs in subsequent filings, because the first-time disclosure tends to contain more information that is new to the market. In this analysis, we replace *MAN* with *FIRSTMAN* and *MANADJ* in the

[26] We also include the interaction terms of each control variable with *NONVOL* in the model as they may exhibit different patterns between voluntarily-disclosing and non-voluntarily-disclosing firms. The inferences are similar but the significance of the coefficient on *MAN*×*NONVOL* becomes weaker (at the 10% level in a one-tailed test) if the interaction terms of control variables are excluded.

regression model. *FIRSTMAN* is set to one for the first time that the firm includes the risk factor section in the 10-K after the SEC mandate, and zero otherwise. *MANADJ* is an indicator variable that equals one for firm-quarters following the first 10-K that contains the risk factor section after the SEC mandate, and zero otherwise.

Panel B of Table 8 reports the regression results. As expected, we find that the magnitude of the coefficient on *FIRSTMAN* is about five times larger than that on *MANADJ* and the difference is significant at the 1% level, though both coefficients are significant at the 5% level or better. A stronger response from the CDS market to the first release of RFDs suggests that the first-time disclosure offers a greater amount of new information on the firm's underlying risk than subsequent disclosures. Consequently, the first RFDs in 10-Ks reduce the transparency component of CDS spreads to a greater extent than the RFDs in subsequent 10-K/10-Q filings.

In an untabulated analysis, we also analyze and compare the effect of RFDs in 10-Ks versus those in 10-Qs. Unlike RFDs in 10-Ks that need to be disclosed and updated regularly, firms are required to provide risk factor updates in 10-Qs only when there are material changes in previously disclosed risk factors. As a result, RFDs in 10-Ks are likely to contain a larger amount of information and thus have a more pronounced effect on CDS pricing than those in 10-Qs. To distinguish the effect of RFDs in 10-Ks versus those in 10-Qs, we add an interaction term *MAN*×*Q4* and re-estimate our regression model, where *Q4* is equal to one for the fourth quarter. Note that the coefficient on *MAN*×*Q4* captures the differential effect of RFDs in 10-Ks versus those in 10-Qs on CDS spreads. Untabulated results show that the coefficients on both *MAN* and *MAN*×*Q4* are negative and significant, suggesting that RFDs in 10-Ks reduce CDS spreads to a larger extent than the RFDs in 10-Qs.

Event study analysis

To mitigate the concern about correlated omitted variables, we employ the change model in our main tests and include a variety of control variables that have been shown to influence credit spreads. In this section, we perform an event study analysis by estimating Eq. (3) below to further alleviate the possibility that the documented effect is driven by other unobserved (and thus uncontrolled) confounding variables. By focusing on the change in CDS spreads in a short window, the event study approach helps minimize correlated omitted variable problems.

$$\Delta SPRD3D_{it} = \alpha_0 + \alpha_1 MAN_{it} + \alpha_2 UE_{it} + \alpha_3 RET_{it} + \alpha_4 STDRET_{it} + \alpha_5 SP500RET_{it} + \alpha_6 \Delta SPOT3D_{it} + \alpha_7 \Delta VIX_{it} + \sum YEAR + \sum IND + \varepsilon_{it} \quad (3)$$

In Eq. (3), the dependent variable, Δ*SPRD3D*, is the change in CDS spreads during the three-day window centered on the SEC filing date, computed as the CDS spread on the last day of the window divided by the spread on the first day of the window minus one. We control for the information contained in and simultaneously released with 10-Ks/10-Qs by including earnings surprises (*UE*) and stock returns (*RET*) as Callen et al. (2009) show that earnings surprises and equity returns are correlated with the change in CDS spreads over the three-day window. Following Shivakumar et al. (2011), we also include variables to control for stock return volatility (*STDRET*), S&P 500 index return (*SP500RET*), the change in risk-free rates of interest (Δ*SPOT3D*), and the change in the S&P 500 implied volatility index (Δ*VIX*) during the three-day window. We present results of the event study analysis in Table 9. Consistent with the findings in Table 3, the coefficient on *MAN* is negative and statistically significant, reinforcing our inferences drawn earlier. The estimated coefficients on the control variables are generally consistent with previous research in terms of the direction and statistical significance. The short-window results in Table 9 therefore buttress the long-window results in Table 3.

Firm fixed effects, DiD analysis, and placebo test

To rule out the possibility that our results are driven by time-invariant unobserved heterogeneity in firm characteristics, we estimate the firm fixed effect regression and report the results in Table 10. As shown in panel A, we find that the coefficient on *MAN* is negative and significant (p-value < 1%), similar to our main results reported in Table 3. All control variables also have the predicted sign as suggested by previous studies.

As mentioned earlier, the variation in firms' fiscal periods causes a slight difference in the timing when firms include RFDs in 10-Ks for the first time after the SEC mandate. This slight variation in the adoption timing can help alleviate the confounding effects caused by contemporary changes in the macro environments around the RFD mandate to some extent. To further alleviate such concerns, we perform a DiD test using Canadian firms that are not affected by the regulatory change in RFDs in 2005 as the control group. In this analysis, we use propensity score matching to construct our matched sample. In particular, following Bhat et al. (2016), for each firm-quarter, we estimate the propensity score using CDS determinants, including profitability, firm size, leverage, credit rating, stock return volatility, and liquidity. We then match each U.S. firm-quarter with a Canadian firm-quarter based on the closest propensity score without replacement.

Panel B of Table 10 reports the results of the DiD analysis using Canadian firms as the control sample. We find that the DiD estimator, namely, the coefficient on *MAN*×*TREAT* is significantly negative (p-value < 1%).[27] This finding suggests that, compared with Canadian firms, CDS spreads decrease significantly for U.S. firms following the RFD mandate. In addition to the DiD analysis, we also conduct a placebo test using fiscal year 2004 as a pseudo adoption year. Though not tabulated for brevity, we find that the coefficient on *MAN* using the pseudo adoption

[27] Following Bertrand and Mullainathan (2003) and Bertrand, Duflo, and Mullainathan (2004), we alternatively estimate the regression model by including only the interaction term, control variables, and year and firm fixed effects, and obtain results similar to those reported in panel B of Table 10.

year of 2004 is insignificantly different from zero. These results, taken together, reaffirm our main findings and strengthen our confidence in the inferences from earlier analyses.

Other robustness tests

It is possible that the disclosure of risk factors is accompanied by changes in the overall financial reporting quality, which might alternatively explain the observed change in CDS spreads after firms provide RFDs in 10-K/10-Q filings. To address this issue, we include proxies for changes in accrual quality and readability in our regression model as additional control variables. Following prior literature (e.g., Dechow, Ge, and Schrand 2010), we measure accrual quality as the absolute value of discretionary accruals, where discretionary accruals are estimated using either the modified Jones model (Dechow, Sloan, and Sweeney 1995) or the Dechow and Dichev (2002) model. We also follow Li (2008) and measure the readability of 10-K/10-Q filings using the Fog index and the filing length. Our results remain unchanged even after controlling for potential concurrent changes in accrual quality and filing readability.

As suggested by prior CDS studies (e.g., Zhang, Zhou, and Zhu 2009), equity returns, the S&P 500 index return, the S&P 500 implied volatility, and the slope of the yield curve are also associated with CDS spreads. Moreover, debt market participants are likely concerned about certain financial ratios, such as the interest coverage ratio and the debt to EBITDA ratio. We therefore re-estimate our regression model by incorporating these additional variables, and obtain similar results. As another robustness check, we use alternative measures of the CDS spread change, including the raw change and the change in excess of the average spread change of all CDS contracts with similar features. We also alternatively control for quarter-year fixed effects in the regression. In general, our results are robust to these modifications.

Our sample includes firms that have provided RFDs on a voluntary basis before the

mandate. Since voluntary RFDs reflect endogenous disclosure choices made by firms, we exclude these voluntarily-disclosing firms from the sample and rerun the regression. Empirical results after excluding these voluntarily-disclosing firms are qualitatively similar to those documented earlier. Finally, because the risks faced by financial firms are quite different from those faced by firms in other industries, we re-estimate the regression using the reduced sample of non-financial firms and obtain consistent results.

5. Conclusion

This study investigates the impact of narrative risk disclosures on the pricing of credit instruments, namely CDS, using the SEC mandate of RFDs as a setting. We find that CDS spreads decrease after RFDs are made available in annual and quarterly reports. The content analysis shows that the disclosures related to idiosyncratic and financial risk are especially relevant in the credit market. We also document a greater effect of RFDs on CDS pricing when the information uncertainty/asymmetry about the reference entity is higher. Consistent with the theoretical predictions of Duffie and Lando (2001), we further find that the slope and concavity of the CDS spread-maturity relation are higher after the RFD mandate. Taken together, these results suggest that textual risk information is beneficial to credit investors in that it helps them better understand and assess the credit risk of the firm, which in turn reduces the transparency (information risk) component of CDS spreads. The information provided by RFDs is particularly useful when evaluating the underlying risks and future prospects of firms with greater information uncertainty. A series of additional analyses and sensitivity tests yield qualitatively identical inferences, lending support to our main results. Overall, the empirical evidence implies that the SEC mandate of RFDs has a positive effect on the credit market, improving the transparency of the firm's credit risk as reflected in decreased CDS spreads. Our findings are in favor of the SEC's view that the content

of corporate filings is enhanced by adding a risk factor section that informs investors of material risks associated with their investments in firms' securities. Nevertheless, such disclosures may come with certain costs. As RFDs mostly convey information about downside risk of the firm, it could possibly intensify investors' perceptions of firm risk, which likely increases credit spreads or affects stock price negatively (Campbell et al. 2014). In addition, proprietary costs are a major concern for firms when disclosing certain risk information that is previously unknown to the public (Hope et al. 2016).

This paper complements the extant research on RFDs that focuses exclusively on equity markets. Our study also responds directly to the call for further research on the effect of corporate disclosures in a CDS setting (Griffin 2014). More importantly, our results provide evidence on the impact of qualitative disclosures on CDS spreads relative to quantitative disclosures (e.g., performance metrics and management earnings forecasts) that have been documented in the prior research (e.g., Callen et al. 2009; Shivakumar et al. 2011). Further, as Armstrong, Guay, and Weber (2010) point out, the focus of capital-markets accounting research has been on equity markets, with relatively few papers in the context of credit markets, especially in the CDS market. Hence, our study adds to the accounting literature in this area and advances our understanding about the role of accounting regulations and disclosures in the pricing of credit risk.

References

Acharya, V. V., and T. C. Johnson. 2007. Insider Trading in Credit Derivatives. *Journal of Financial Economics* 84 (1): 110-141.

Armstrong, C. S., W. R. Guay, and J. P. Weber. 2010. The Role of Information and Financial Reporting in Corporate Governance and Debt Contracting. *Journal of Accounting and Economics* 50 (2–3): 179-234.

Arora, N., S. Richardson, and İ. Tuna. 2014. Asset Reliability and Security Prices: Evidence from Credit Markets. *Review of Accounting Studies* 19 (1): 363-395.

Bajlum, C., and P. T. Larsen. 2008. Accounting Transparency and the Term Structure of Credit Default Swap Spreads. Working paper, Copenhagen Business School.

Berger, P. G., H. J. Chen, and F. Li. 2012. Firm Specific Information and the Cost of Equity Capital. Working paper, University of Chicago.

Bertrand, M., E. Duflo, and S. Mullainathan. 2004. How Much Should We Trust Differences-in-Differences Estimates? *The Quarterly Journal of Economics* 119 (1): 249-275.

Bertrand, M., and S. Mullainathan. 2003. Enjoying the Quiet Life? Corporate Governance and Managerial Preferences. *Journal of Political Economy* 111 (5): 1043-1075.

Bharath, S. T., J. Sunder, and S. V. Sunder. 2008. Accounting Quality and Debt Contracting. *The Accounting Review* 83 (1): 1-28.

Bhat, G., J. L. Callen, and D. Segal. 2014. Credit Risk and IFRS: The Case of Credit Default Swaps. *Journal of Accounting, Auditing & Finance* 29 (2): 129-162.

Bhat, G., J. L. Callen, and D. Segal. 2016. Testing the Transparency Implications of Mandatory IFRS Adoption: The Spread/Maturity Relation of Credit Default Swaps. *Management Science* 62 (12): 3472-3493.

Bradshaw, M. T., B. J. Bushee, and G. S. Miller. 2004. Accounting Choice, Home Bias, and U.S. Investment in Non-U.S. Firms. *Journal of Accounting Research* 42 (5): 795-841.

Callen, J. L., J. Livnat, and D. Segal. 2009. The Impact of Earnings on the Pricing of Credit Default Swaps. *The Accounting Review* 84 (5): 1363-1394.

Campbell, J., H. Chen, D. Dhaliwal, H.-m. Lu, and L. Steele. 2014. The Information Content of Mandatory Risk Factor Disclosures in Corporate Filings. *Review of Accounting Studies* 19 (1): 396-455.

Collin-Dufresne, P., R. S. Goldstein, and J. S. Martin. 2001. The Determinants of Credit Spread Changes. *The Journal of Finance* 56 (6): 2177-2207.

Correia, M., S. Richardson, and İ. Tuna. 2012. Value Investing in Credit Markets. *Review of Accounting Studies* 17 (3): 572-609.

Das, S. R., P. Hanouna, and A. Sarin. 2009. Accounting-Based versus Market-Based Cross-Sectional Models of CDS Spreads. *Journal of Banking & Finance* 33 (4): 719-730.

De Franco, G. U. S., F. P. Vasvari, and R. Wittenberg-Moerman. 2009. The Informational Role of Bond Analysts. *Journal of Accounting Research* 47 (5): 1201-1248.

Dechow, P., W. Ge, and C. Schrand. 2010. Understanding Earnings Quality: A Review of the Proxies, Their Determinants and Their Consequences. *Journal of Accounting and Economics* 50 (2–3): 344-401.

Dechow, P. M., and I. D. Dichev. 2002. The Quality of Accruals and Earnings: The Role of Accrual Estimation Errors. *The Accounting Review* 77: 35-59.

Dechow, P. M., R. G. Sloan, and A. P. Sweeney. 1995. Detecting Earnings Management. *The Accounting Review* 70 (2): 193-225.

Defond, M. L., and J. Zhang. 2014. The Timeliness of the Bond Market Reaction to Bad Earnings News. *Contemporary Accounting Research* 31 (3): 911-936.
Duffie, D., and D. Lando. 2001. Term Structures of Credit Spreads with Incomplete Accounting Information. *Econometrica* 69 (3): 633-664.
Gehde-Trapp, M., Y. Gündüz, and J. Nasev. 2015. The Liquidity Premium in CDS Transaction Prices: Do Frictions Matter? *Journal of Banking & Finance* 61: 184-205.
Griffin, P. A. 2014. The Market for Credit Default Swaps: New Insights into Investors' Use of Accounting Information? *Accounting & Finance* 54 (3): 847-883.
Griffin, P. A., H. A. Hong, and J.-B. Kim. 2016. Price Discovery in the CDS Market: The Informational Role of Equity Short Interest. *Review of Accounting Studies* 21 (4): 1116-1148.
Hann, R. N., M. Ogneva, and O. Ozbas. 2013. Corporate Diversification and the Cost of Capital. *The Journal of Finance* 68 (5): 1961-1999.
Hillegeist, S., E. Keating, D. Cram, and K. Lundstedt. 2004. Assessing the Probability of Bankruptcy. *Review of Accounting Studies* 9 (1): 5-34.
Hope, O.-K., D. Hu, and H. Lu. 2016. The Benefits of Specific Risk-Factor Disclosures. *Review of Accounting Studies* 21 (4): 1005-1045.
Jorion, P., and G. Zhang. 2007. Good and Bad Credit Contagion: Evidence from Credit Default Swaps. *Journal of Financial Economics* 84 (3): 860-883.
Jorion, P., and G. Zhang. 2009. Credit Contagion from Counterparty Risk. *The Journal of Finance* 64 (5): 2053-2087.
Kaplan, R. S. 2011. Accounting Scholarship that Advances Professional Knowledge and Practice. *The Accounting Review* 86 (2): 367-383.
Kim, J.-B., B. Y. Song, and L. Zhang. 2011. Internal Control Weakness and Bank Loan Contracting: Evidence from SOX Section 404 Disclosures. *The Accounting Review* 86 (4): 1157-1188.
Kim, S., P. Kraft, and S. Ryan. 2013. Financial Statement Comparability and Credit Risk. *Review of Accounting Studies* 18 (3): 783-823.
Kothari, S. P., K. Ramanna, and D. J. Skinner. 2010. Implications for GAAP from an Analysis of Positive Research in Accounting. *Journal of Accounting and Economics* 50 (2–3): 246-286.
Kraft, P. 2015. Rating Agency Adjustments to GAAP Financial Statements and Their Effect on Ratings and Credit Spreads. *The Accounting Review* 90 (2): 641-674.
Kraft, P., and W. R. Landsman. 2017. Effect of Mandatory IFRS Adoption on Accounting-Based Prediction Models for CDS Spreads. Working paper, New York University.
Kravet, T., and V. Muslu. 2013. Textual Risk Disclosures and Investors' Risk Perceptions. *Review of Accounting Studies* 18 (4): 1088-1122.
Lang, M. 1991. Time-Varying Stock Price Response to Earnings Induced by Uncertainty about the Time-Series Process of Earnings. *Journal of Accounting Research* 29 (2): 229-257.
Li, F. 2008. Annual Report Readability, Current Earnings, and Earnings Persistence. *Journal of Accounting and Economics* 45 (2–3): 221-247.
Li, F. 2010. Textual Analysis of Corporate Disclosures: A Survey of the Literature. *Journal of Accounting Literature* 29: 143-165.
Longstaff, F. A., S. Mithal, and E. Neis. 2005. Corporate Yield Spreads: Default Risk or Liquidity? New Evidence from the Credit Default Swap Market. *The Journal of Finance* 60 (5): 2213-2253.
Malone, S. 2005. Refco Risks Boiler-Plate Disclosure. *Reuters*, October 21, http://w4.stern.nyu.edu/news/news.cfm?doc_id=5094, retrieved 01/28/2011.

Merton, R. C. 1974. On the Pricing of Corporate Debt: The Risk Structure of Interest Rates. *The Journal of Finance* 29 (2): 449-470.

Merton, R. C. 1987. A Simple Model of Capital Market Equilibrium with Incomplete Information. *The Journal of Finance* 42 (3): 483-510.

Qiu, J., and F. Yu. 2012. Endogenous Liquidity in Credit Derivatives. *Journal of Financial Economics* 103 (3): 611-631.

Sengupta, P. 1998. Corporate Disclosure Quality and the Cost of Debt. *The Accounting Review* 73 (4): 459-474.

Shivakumar, L., O. Urcan, F. Vasvari, and L. Zhang. 2011. The Debt Market Relevance of Management Earnings Forecasts: Evidence from Before and During the Credit Crisis. *Review of Accounting Studies* 16 (3): 464-486.

Tang, D. Y., F. Tian, and H. Yan. 2015. Internal Control Quality and Credit Default Swap Spreads. *Accounting Horizons* 29 (3): 603-629.

Watts, R. L. 2003. Conservatism in Accounting Part I: Explanations and Implications. *Accounting Horizons* 17 (3): 207-221.

Wittenberg-Moerman, R. 2009. The Impact of Information Asymmetry on Debt Pricing and Maturity. Working paper, University of Southern California.

Yu, F. 2005. Accounting Transparency and the Term Structure of Credit Spreads. *Journal of Financial Economics* 75 (1): 53-84.

Zhang, B. Y., H. Zhou, and H. Zhu. 2009. Explaining Credit Default Swap Spreads with the Equity Volatility and Jump Risks of Individual Firms. *Review of Financial Studies* 22 (12): 5099-5131.

Zhang, X. F. 2006. Information Uncertainty and Stock Returns. *The Journal of Finance* 61 (1): 105-137.

APPENDIX 1: Examples of RFDs in Item 1A of the 10-K

The Goodyear Tire & Rubber Company

https://www.sec.gov/Archives/edgar/data/42582/000095015207001224/l24626ae10vk.htm

Our long term ability to meet our obligations and to repay maturing indebtedness is dependent on our ability to access capital markets in the future and to improve our operating results.

The adequacy of our liquidity depends on our ability to achieve an appropriate combination of operating improvements, financing from third parties, access to capital markets and asset sales. Although we completed a major refinancing of our senior secured credit facilities on April 8, 2005, and issued $1 billion in senior unsecured notes in November 2006, we may undertake additional financing actions in the capital markets in order to ensure that our future liquidity requirements are addressed. These actions may include the issuance of additional equity.

Our access to the capital markets cannot be assured and is dependent on, among other things, the degree of success we have in implementing our cost reduction plans and improving the results of our North American Tire Segment. Future liquidity requirements also may make it necessary for us to incur additional debt. A substantial portion of our assets is subject to liens securing our indebtedness. As a result, we are limited in our ability to pledge our remaining assets as security for additional secured indebtedness. Our failure to access the capital markets or incur additional debt in the future could have a material adverse effect on our liquidity and operations, and could require us to consider further measures, including deferring planned capital expenditures, reducing discretionary spending, selling additional assets and restructuring existing debt.

Amkor Technology, Inc.

http://www.sec.gov/Archives/edgar/data/1047127/000095015307000403/p73489e10vk.htm

High Leverage and Restrictive Covenants — Our Substantial Indebtedness Could Adversely Affect Our Financial Condition and Prevent Us from Fulfilling Our Obligations.

Substantial Leverage. We now have, and for the foreseeable future will continue to have, a significant amount of indebtedness. As of December 31, 2006, our total debt balance was $2,005.3 million, of which $185.4 million was classified as a current liability. In addition, despite current debt levels, the terms of the indentures governing our indebtedness allow us or our subsidiaries to incur more debt, subject to certain limitations. If new debt is added to our consolidated debt level, the related risks that we now face could intensify.

Covenants in the agreements governing our existing debt, and debt we may incur in the future, may materially restrict our operations, including our ability to incur debt, pay dividends, make certain investments and payments, and encumber or dispose of assets. The agreements also impose affirmative covenants on us including financial reporting obligations. In addition, financial covenants contained in agreements relating to our existing and future debt could lead to a default in the event our results of operations do not meet our plans and we are unable to amend such financial covenants. Bondholder groups may be aggressive and may attempt to call defaults for technical violations of covenants that have little or nothing to do with our financial performance in an effort to extract consent fees from us or to force a refinancing. A default and acceleration under one debt instrument may also trigger cross-acceleration under our other debt instruments. A default or event of default under one or more of our revolving credit facilities would also preclude us from borrowing additional funds under such facilities. An event of default under any debt instrument, if not cured or waived, could have a material adverse effect on us.

For example, on August 11, 2006, we received a letter dated August 10, 2006 from U.S. Bank National Association ("US Bank") as trustee for the holders of our 5% Convertible Subordinated Notes due 2007, 10.5% Senior Subordinated Notes due 2009, 9.25% Senior Notes due 2008, 9.25% Senior Notes due 2016, 6.25% Convertible Subordinated Notes Due 2013, 7.75% Senior Notes due 2013 and 2.5% Convertible Senior Subordinated Notes due 2011 stating that US Bank, as trustee, had not received our financial statements for the quarter ended June 30, 2006, and that we have 60 days from the date of the letter to file our Quarterly Report on Form 10-Q for the fiscal quarter ended June 30, 2006 or it will be considered an "Event of Default" under the indentures governing each of the above-listed notes. On the same day, we received a letter from Wells Fargo Bank National Association ("Wells Fargo"), as trustee for our 7.125% Senior Notes due 2011, stating that we failed to file our Quarterly Report on Form 10-Q for the fiscal quarter ended June 30, 2006, demanding that we immediately file such quarterly report and indicating that

unless we file a Form 10-Qwithin 60 days after the date of such letter, it will ripen into an "Event of Default" under the indenture governing our 7.125% Senior Notes due 2011.

We cured the alleged defaults described in the US Bank and Wells Fargo letters by filing our Quarterly Report for the quarter ended June 30, 2006 within the 60 day period and avoided the occurrence of an alleged "Event of Default." However, had we not filed our Quarterly Report on Form 10-Q for the quarter ended June 30, 2006 within the requisite period, the bondholders may have been able to accelerate all outstanding amounts under the above listed notes and trigger acceleration under our other debt agreements, which could have resulted in a material adverse effect.

Our substantial indebtedness could:
- make it more difficult for us to satisfy our obligations with respect to our indebtedness;
- increase our vulnerability to general adverse economic and industry conditions;
- limit our ability to fund future working capital, capital expenditures, research and development and other general corporate requirements;
- require us to dedicate a substantial portion of our cash flow from operations to service payments on our debt;
- limit our flexibility to react to changes in our business and the industry in which we operate;
- place us at a competitive disadvantage to any of our competitors that have less debt; and
- limit, along with the financial and other restrictive covenants in our indebtedness, among other things, our ability to borrow additional funds.

Motorola, Inc.

https://www.sec.gov/Archives/edgar/data/68505/000095013707003011/c11830e10vk.htm

We purchase a large amount of credit insurance to mitigate some of our credit risks.

Our ability to sell certain of our receivables could be negatively impacted if we are not able to continue to purchase credit insurance in certain countries and in sufficient quantities. In addition, our success in certain countries may be dependent on our ability to obtain sufficient credit insurance.

We may provide financing and financial guarantees to our customers, some of which may be for significant amounts.

The competitive environment in which we operate may require us to provide long-term customer financing to a customer in order to win a contract. Customer financing arrangements may include all or a portion of the purchase price for our products and services. In some circumstances, these loans can be very large. We may also assist customers in obtaining financing from banks and other sources and may also provide financial guarantees on behalf of our customers. Our success, particularly in our infrastructure businesses, may be dependent, in part, upon our ability to provide customer financing on competitive terms and on our customers' creditworthiness.

We also provide revolving, short-term financing to certain customers and distributors that purchase our equipment. Our success may be dependent, in part, on our ability to provide this financing. Our financial results could be negatively impacted if our customers or distributors fail to repay this revolving, short-term debt and/or our sales to such customers or distributors could be reduced in the event of real or perceived issues about the credit quality of the customer or distributor.

When we lend our customers money in connection with the sale of our equipment, we are at risk of not being repaid.

While we have generally been able to place a portion of our customer financings with third-party lenders, a portion of these financings are supported directly by us. There can be higher risks of default associated with some of these financings, particularly when provided to start-up operations such as local network providers, customers in developing countries, or customers in specific financing-intensive areas of the industry (such as 3G wireless operators). Should customers fail to meet their obligations on new or existing loans, losses could be incurred and such losses could negatively impact our financial results.

Ford Motor Company

https://www.sec.gov/Archives/edgar/data/37996/000095012407001201/k12522e10vk.htm

Substantial negative Automotive operating-related cash flows for the near- to medium-term affecting our ability to

meet our obligations, invest in our business or refinance our debt.
During the next few years, we expect substantial negative operating-related cash outflows. Future borrowings may not be available to us under our credit facilities or otherwise in amounts sufficient to enable us to pay our indebtedness and to fund our other liquidity needs. For example, if we are unable to meet certain covenants of our $11.5 billion secured credit facility established in December 2006 (e.g., if the value of assets pledged do not exceed outstanding borrowings), we will not be able to borrow under the facility. If our cash flow is worse than expected due to an economic recession, work stoppages, increased pension contributions or otherwise, or if we are unable to borrow under our credit facilities or otherwise for these purposes, we may need to refinance or restructure all or a portion of our indebtedness on or before maturity, reduce or delay capital investments, or seek to raise additional capital. We may not be able to implement one or more of these alternatives on terms acceptable to us, or at all. The terms of our existing or future debt agreements may restrict us from pursuing any of these alternatives. Should our cash flow be worse than anticipated or we fail to achieve any of these alternatives, this could materially adversely affect our ability to repay our indebtedness and otherwise have a substantial adverse effect on our financial condition and results of operations. For further information on our liquidity and capital resources, see "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations — Liquidity and Capital Resources" and Note 15 of the Notes to the Financial Statements.

Substantial levels of Automotive indebtedness adversely affecting our financial condition or preventing us from fulfilling our debt obligations (which may grow because we are able to incur substantially more debt, including additional secured debt).
As a result of our recent financing actions and our other debt, we are a highly leveraged company. Our significant Automotive debt service obligations could have important consequences, including the following: our high level of indebtedness could make it difficult for us to satisfy our obligations with respect to our outstanding indebtedness; our ability to obtain additional financing for working capital, capital expenditures, acquisitions, if any, or general corporate purposes may be impaired; we must use a substantial portion of our cash flow from operations to pay interest on our indebtedness, which will reduce the funds available to us for operations and other purposes; and our high level of indebtedness makes us more vulnerable to economic downturns and adverse developments in our business. The more leveraged we become, the more we become exposed to the risks described herein. See "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations — Liquidity and Capital Resources" and Note 15 of the Notes to the Financial Statements for additional information regarding our indebtedness.

Xerox Corporation

https://www.sec.gov/Archives/edgar/data/108772/000119312507034083/d10k.htm

We need to maintain adequate liquidity in order to have sufficient cash to meet operating cash flow requirements and to repay maturing debt and other obligations. If we fail to comply with the covenants contained in our various borrowing agreements, it may adversely affect our liquidity, results of operations and financial condition.
Our liquidity is a function of our ability to successfully generate cash flows from a combination of efficient operations and improvement therein, access to capital markets, securitizations, funding from third parties and borrowings secured by our finance receivables portfolios. As of December 31, 2006, total cash, cash equivalents and short-term investments was $1.5 billion, and our borrowing capacity under our 2006 Credit Facility was $1.235 billion, reflecting no outstanding borrowings and $15 million of letters of credit that have been utilized. We also have funding available through various secured borrowing arrangements. We believe our liquidity (including operating and other cash flows that we expect to generate) will be sufficient to meet operating requirements as they occur; however, our ability to maintain sufficient liquidity going forward depends on our ability to generate cash from operations and access to the capital markets, secured borrowings, securitizations and funding from third parties, all of which are subject to general economic, financial, competitive, legislative, regulatory and other market factors that are beyond our control.

The 2006 Credit Facility contains affirmative and negative covenants including limitations on: (i) liens of Xerox and certain of our subsidiaries securing debt, (ii) certain fundamental changes to corporate structure, (iii) changes in nature of business and (iv) limitations on debt incurred by certain subsidiaries. The 2006 Credit Facility contains financial maintenance covenants, including maximum leverage (debt for borrowed money divided by consolidated EBITDA, as defined) and a minimum interest coverage ratio (consolidated EBITDA divided by consolidated interest expense, as defined). The indentures governing our outstanding senior notes contain affirmative and negative covenants including limitations on: issuance of secured debt and preferred stock; investments and acquisitions; mergers; certain

transactions with affiliates; creation of liens; asset transfers; hedging transactions; payment of dividends and certain other payments. They do not, however, contain any financial maintenance covenants, except the fixed charge coverage ratio applicable to certain types of payments. Our U.S. Loan Agreement with General Electric Capital Corporation ("GECC") (effective through 2010) relating to our customer financing program (the "Loan Agreement") provides for loans secured by eligible finance receivables up to $5 billion outstanding at any one time. As of December 31, 2006, $1.5 billion was outstanding under the Loan Agreement, including similar loan agreements with GE in the U.K. and Canada. These agreements incorporate the financial maintenance covenants contained in the 2006 Credit Facility and contains other affirmative and negative covenants.

At December 31, 2006, we were in full compliance with the covenants and other provisions of the 2006 Credit Facility, the senior notes and the Loan Agreement. Any failure to be in compliance with any material provision or covenant of the 2006 Credit Facility or the senior notes could have a material adverse effect on our liquidity, results of operations and financial condition. Failure to be in compliance with the covenants in the Loan Agreement, including the financial maintenance covenants incorporated from the 2006 Credit Facility, would result in an event of termination under the Loan Agreement and in such case GECC would not be required to make further loans to us. If GECC were to make no further loans to us, and assuming a similar facility was not established and that we were unable to obtain replacement financing in the public debt markets, it could materially adversely affect our liquidity and our ability to fund our customers' purchases of our equipment and this could materially adversely affect our results of operations.

The Coca-Cola Company

https://www.sec.gov/Archives/edgar/data/21344/000104746907001328/a2176230z10-k.htm

We rely on our bottling partners for a significant portion of our business. If we are unable to maintain good relationships with our bottling partners, our business could suffer.

We generate a significant portion of our net operating revenues by selling concentrates and syrups to bottlers in which we do not have any ownership interest or in which we have a noncontrolling ownership interest. In 2006, approximately 83 percent of our worldwide unit case volume was produced and distributed by bottling partners in which the Company did not have controlling interests. As independent companies, our bottling partners, some of which are publicly traded companies, make their own business decisions that may not always align with our interests. In addition, many of our bottling partners have the right to manufacture or distribute their own products or certain products of other beverage companies. If we are unable to provide an appropriate mix of incentives to our bottling partners through a combination of pricing and marketing and advertising support, they may take actions that, while maximizing their own short-term profits, may be detrimental to our Company or our brands, or they may devote more of their energy and resources to business opportunities or products other than those of the Company. Such actions could, in the long run, have an adverse effect on our profitability. In addition, the loss of one or more major customers by one of our major bottling partners, or disruptions of bottling operations that may be caused by strikes, work stoppages or labor unrest affecting such bottlers, could indirectly affect our results.

If our bottling partners' financial condition deteriorates, our business and financial results could be affected.

The success of our business depends on the financial strength and viability of our bottling partners. Our bottling partners' financial condition is affected in large part by conditions and events that are beyond our control, including competitive and general market conditions in the territories in which they operate and the availability of capital and other financing resources on reasonable terms. While under our bottlers' agreements we generally have the right to unilaterally change the prices we charge for our concentrates and syrups, our ability to do so may be materially limited by the financial condition of the applicable bottlers and their ability to pass price increases along to their customers. In addition, because we have investments in certain of our bottling partners, which we account for under the equity method, our operating results include our proportionate share of such bottling partners' income or loss. Also, a deterioration of the financial condition of bottling partners in which we have investments could affect the carrying values of such investments and result in write-offs. Therefore, a significant deterioration of our bottling partners' financial condition could adversely affect our financial results.

APPENDIX 2: Variable definitions

Variable	Definition
Dependent variables	
SPRD	Natural logarithm of the CDS spread (in basis points) on the first trading day after the SEC filing date of the current quarter.
Δ*SPRD*	Change in CDS spreads during the current quarter, calculated as the CDS spread on the first trading day after the SEC filing date of the current quarter divided by the spread on the first trading day after the SEC filing date of the previous quarter minus one.
Test variable	
MAN	Indicator variable that equals one after the firm complies with the SEC mandate to include the risk factor section (Item 1A – Risk Factors) in 10-K/10-Q filings, and zero otherwise.
Control variables	
ROA	Return on assets, defined as income before extraordinary items divided by total assets.
Δ*ROA*	Change in *ROA*, measured as *ROA* for the current quarter minus *ROA* in the same quarter of the previous year.
LEV	Leverage, calculated as long-term debt scaled by total assets.
Δ*LEV*	Change in *LEV*, measured as *LEV* for the current quarter minus *LEV* in the same quarter of the previous year.
SPOT	One-year T-bill rate.
Δ*SPOT*	Change in *SPOT* during the current quarter.
STDRET	Stock return volatility, measured as the standard deviation of the firm's daily stock returns.
Δ*STDRET*	Change in *STDRET* during the current quarter.
RATE	S&P credit rating on a numerical basis (the lower value represents the higher rating).
POSRATE	Indicator variable equal to one if the firm has experienced an increase in the S&P rating during the current quarter, and zero otherwise.
NEGRATE	Indicator variable equal to one if the firm has experienced a decrease in the S&P rating during the current quarter, and zero otherwise.
SIZE	Firm size, defined as the natural logarithm of the market value of equity.
Δ*SIZE*	Change in *SIZE*, measured as *SIZE* for the current quarter minus *SIZE* in the previous quarter.
DRISK	Probability of default, calculated using the Black-Scholes-Merton formula following Hillegeist et al. (2004).
Δ*DRISK*	Change in *DRISK* during the current quarter.
ILLIQUID	Liquidity, computed as the residual from the regression of the log of the bid-ask spread on firm size, stock return volatility, credit rating, and leverage.
Δ*ILLIQUID*	Change in liquidity during the current quarter.
Lagged SPRD	Lagged value of *SPRD*.

TABLE 1
Sample distribution

Panel A: Sample distribution by year

Year	Frequency	Percent
2003	289	3.85
2004	1,604	21.38
2005	2,031	27.07
2006	2,012	26.81
2007	1,568	20.90
Total	7,504	100.00

Panel B: Sample distribution by industry

Industry	Frequency	Percent
Agriculture, forestry, and fishing	14	0.19
Mining	492	6.56
Construction	160	2.13
Manufacturing	3,033	40.42
Transportation, communications, electric, gas, and sanitary services	1,116	14.87
Trade	687	9.16
Finance, insurance, and real estate	1,367	18.22
Services	604	8.05
Public administration	31	0.41
Total	7,504	100.00

TABLE 2
Descriptive statistics

	Pre-disclosure period (*MAN*=0; N=3,570)					Post-disclosure period (*MAN*=1; N=3,934)				
	Mean	Median	Std. Dev.	Q1	Q3	Mean	Median	Std. Dev.	Q1	Q3
SPRD	4.004	3.813	0.953	3.325	4.472	3.917***	3.726***	1.026	3.190	4.542
ROA	0.013	0.011	0.014	0.004	0.021	0.014***	0.012***	0.015	0.005	0.022
LEV	0.257	0.224	0.161	0.143	0.345	0.247***	0.207***	0.164	0.126	0.333
SPOT	3.020	3.290	1.045	2.090	3.900	4.735***	4.910***	0.518	4.750	5.020
STDRET	0.016	0.014	0.006	0.011	0.018	0.016***	0.015***	0.007	0.011	0.020
RATE	8.568	9.000	2.974	6.000	10.000	8.757***	9.000***	3.008	7.000	10.000
SIZE	8.970	8.875	1.247	8.093	9.725	9.098***	9.052***	1.267	8.178	9.879
DRISK	0.091	0.000	0.285	0.000	0.000	0.113***	0.000***	0.314	0.000	0.000
ILLIQUID	0.018	0.012	0.386	-0.246	0.248	-0.016***	-0.061***	0.411	-0.290	0.197
Lagged SPRD	4.018	3.823	0.959	3.326	4.504	3.889***	3.704***	1.011	3.178	4.490

*** represents a significance level of 0.01 (two-tailed) for the difference between the pre- and post-disclosure periods. All continuous variables are winsorized at the 1st and 99th percentiles. Variables are as defined in Appendix 2.

TABLE 3
The relation between CDS spreads and the mandate of RFDs

Panel A: Level analysis		**Panel B:** Change analysis	
Dependent variable: *SPRD*		Dependent variable: Δ*SPRD*	
Intercept	0.724***	*Intercept*	0.056**
	(0.068)		(0.026)
MAN	-0.091***	*MAN*	-0.175***
	(0.013)		(0.015)
ROA	-2.091***	Δ*ROA*	-1.045***
	(0.324)		(0.362)
LEV	0.205***	Δ*LEV*	-0.031
	(0.042)		(0.068)
SPOT	-0.091***	Δ*SPOT*	-0.015
	(0.008)		(0.046)
STDRET	2.432***	Δ*STDRET*	1.953*
	(0.874)		(1.079)
RATE	0.027***	*POSRATE*	-0.012
	(0.004)		(0.029)
SIZE	-0.027***	*NEGRATE*	0.002
	(0.005)		(0.028)
DRISK	0.048**	Δ*SIZE*	-0.396***
	(0.019)		(0.040)
ILLIQUID	0.045***	Δ*DRISK*	0.141**
	(0.010)		(0.059)
Lagged SPRD	0.815***	Δ*ILLIQUID*	0.034**
	(0.012)		(0.017)
Year fixed effects	Included	Year fixed effects	Included
Industry fixed effects	Included	Industry fixed effects	Included
Adjusted R^2	0.919	Adjusted R^2	0.142
N	7,504	N	7,504

*, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors clustered by firm are shown in parentheses. The coefficients on year and industry indicators are suppressed for brevity. Variables are as defined in Appendix 2.

TABLE 4
RFD content analysis

Dependent variable: Δ*SPRD*	(1) Total words	(2) Risk keywords	(3) Risk types
Intercept	0.043	0.137	0.265
	(0.737)	(0.724)	(0.566)
Δ*LENGTH1A*	0.585**		
	(0.269)		
Δ*RWORD1A*		0.566**	
		(0.275)	
Δ*RWORD1A_SYS*			-0.311**
			(0.149)
Δ*RWORD1A_IDIO*			0.454*
			(0.267)
Δ*RWORD1A_FIN*			1.001**
			(0.470)
Δ*RWORD1A_LIT*			-0.783
			(0.623)
Δ*RWORD1A_TAX*			-0.326
			(0.338)
Δ*LENGTH10K*	-0.038	-0.037	-0.027
	(0.183)	(0.180)	(0.179)
Δ*ROA*	-1.561	-1.601	-1.474
	(1.051)	(1.056)	(1.031)
Δ*LEV*	0.870	0.866	0.965
	(0.979)	(0.989)	(0.971)
Δ*SPOT*	-3.535***	-3.521***	-3.595***
	(0.421)	(0.424)	(0.418)
Δ*STDRET*	-2.439	-2.062	-2.483
	(5.422)	(5.412)	(5.373)
POSRATE	-0.175	-0.176	-0.226
	(0.168)	(0.167)	(0.169)
NEGRATE	0.220	0.234	0.191
	(0.149)	(0.149)	(0.149)
Δ*SIZE*	-1.315***	-1.305***	-1.308***
	(0.165)	(0.165)	(0.165)
Δ*DRISK*	-0.187	-0.195	-0.338
	(0.410)	(0.411)	(0.392)
Δ*ILLIQUID*	0.703***	0.701***	0.713***
	(0.213)	(0.213)	(0.212)
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
Adjusted R^2	0.419	0.419	0.422
N	1,505	1,505	1,505

*, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors clustered by firm are shown in parentheses. The coefficients on year and industry indicators are suppressed for brevity. Δ*LENGTH1A* is the change in the number of words in the risk factor section from the previous to the current 10-K divided by the number of words in the risk factor section of the previous 10-K. Δ*RWORD1A* is the change in the number of risk keywords in the risk factor section from the previous to the current 10-K divided by the number of risk keywords in the risk factor section of the previous 10-K. Risk keywords are as defined in Campbell et al. (2014). Δ*RWORD1A_SYS*, Δ*RWORD1A_IDIO*, Δ*RWORD1A_FIN*, Δ*RWORD1A_LIT*, and Δ*RWORD1A_TAX* is the change in the percentage of keywords related to systematic, idiosyncratic, financial, litigation, and tax risk in the risk factor section from the previous to the current 10-K, respectively. Δ*LENGTH10K* is the change in the number of total words from the previous to the current 10-K divided by the number of total words in the previous 10-K. Other variables are as defined in Appendix 2.

TABLE 5
Cross-sectional analysis based on information uncertainty

Dependent variable: Δ*SPRD*	(1) *FDISP*	(2) *SEG*	(3) *CDS DEPTH*
Intercept	0.045*	0.049*	0.050*
	(0.025)	(0.026)	(0.027)
MAN	-0.148***	-0.162***	-0.154***
	(0.017)	(0.016)	(0.017)
COND	0.018*	0.011	-0.002
	(0.010)	(0.010)	(0.010)
MAN×COND	-0.030*	-0.024*	-0.045***
	(0.015)	(0.014)	(0.015)
Δ*ROA*	-1.210***	-1.051***	-1.030***
	(0.378)	(0.361)	(0.361)
Δ*LEV*	-0.088	-0.033	-0.039
	(0.073)	(0.068)	(0.068)
Δ*SPOT*	-0.005	-0.016	-0.019
	(0.045)	(0.046)	(0.046)
Δ*STDRET*	2.708**	1.946*	1.903*
	(1.112)	(1.080)	(1.078)
POSRATE	-0.018	-0.011	-0.011
	(0.031)	(0.029)	(0.029)
NEGRATE	0.022	0.002	0.000
	(0.030)	(0.028)	(0.028)
Δ*SIZE*	-0.383***	-0.395***	-0.393***
	(0.037)	(0.040)	(0.040)
Δ*DRISK*	0.160**	0.141**	0.145**
	(0.066)	(0.059)	(0.059)
Δ*ILLIQUID*	0.038**	0.034**	0.035**
	(0.017)	(0.017)	(0.017)
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
Adjusted R^2	0.140	0.142	0.144
N	6,890	7,504	7,504

*, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors clustered by firm are shown in parentheses. The coefficients on year and industry indicators are suppressed for brevity. *COND* is one of the following three measures: *FDISP*, *SEG*, and *CDS DEPTH*. *FDISP* is an indicator variable that equals one if the analysts' forecast dispersion for the firm is above the sample median, and zero otherwise. *SEG* is an indicator variable that equals one if the number of business segments that the firm has in different 3-digit SIC industries is above the sample median, and zero otherwise. *CDS DEPTH* is an indicator variable that equals one if the number of quote contributors for the firm's CDS contract is below the sample median, and zero otherwise. Other variables are as defined in Appendix 2.

TABLE 6
CDS volatility analysis

Panel A: Level analysis		**Panel B:** Change analysis	
Dependent variable: *CDSVOL*		Dependent variable: Δ*CDSVOL*	
Intercept	-0.128***	*Intercept*	-0.056***
	(0.033)		(0.010)
MAN	-0.010*	*MAN*	-0.021***
	(0.005)		(0.006)
ROA	-1.023***	Δ*ROA*	-0.273
	(0.205)		(0.221)
LEV	0.153***	Δ*LEV*	0.025
	(0.023)		(0.035)
SPOT	-0.016***	Δ*SPOT*	-0.140***
	(0.004)		(0.022)
STDRET	3.742***	Δ*STDRET*	1.033**
	(0.508)		(0.517)
RATE	0.005***	*POSRATE*	0.003
	(0.002)		(0.010)
SIZE	0.000	*NEGRATE*	-0.010
	(0.003)		(0.013)
DRISK	0.059***	Δ*SIZE*	-0.069***
	(0.014)		(0.020)
ILLIQUID	0.012**	Δ*DRISK*	-0.012
	(0.005)		(0.042)
Lagged CDSVOL	0.535***	Δ*ILLIQUID*	0.009
	(0.036)		(0.007)
Year fixed effects	Included	Year fixed effects	Included
Industry fixed effects	Included	Industry fixed effects	Included
Adjusted R^2	0.523	Adjusted R^2	0.072
N	7,372	N	7,372

*, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors clustered by firm are shown in parentheses. The coefficients on year and industry indicators are suppressed for brevity. *CDSVOL* is the standard deviation of CDS spreads from the first day after the SEC filing date of the current quarter to the first day after the SEC filing date of the next quarter. Δ*CDSVOL* is the difference between *CDSVOL* and lagged *CDSVOL*. Other variables are as defined in Appendix 2.

TABLE 7
CDS spread-maturity relation around the RFD mandate

Dependent variable: *SPRD*	All maturities		Maturities of five years or less	
	(1)	(2)	(3)	(4)
Intercept	1.843***	1.958***	1.411***	1.575***
	(0.205)	(0.252)	(0.240)	(0.312)
MAN		-0.275***		-0.285***
		(0.077)		(0.091)
MATURITY	0.195***	0.166***	0.553***	0.470***
	(0.016)	(0.019)	(0.036)	(0.049)
MAN×MATURITY		0.053***		0.127**
		(0.020)		(0.054)
$MATURITY^2$	-0.005***	-0.004***	-0.044***	-0.038***
	(0.000)	(0.000)	(0.002)	(0.003)
$MAN×MATURITY^2$		-0.001***		-0.007*
		(0.001)		(0.004)
ROA	-5.936***	-5.938***	-6.836***	-6.789***
	(2.086)	(2.087)	(2.583)	(2.579)
LEV	0.758***	0.763***	0.892***	0.892***
	(0.196)	(0.195)	(0.231)	(0.232)
SPOT	-0.175***	-0.171**	-0.259***	-0.256**
	(0.067)	(0.076)	(0.092)	(0.107)
STDRET	19.296***	19.391***	23.287***	23.466***
	(1.698)	(1.589)	(1.917)	(1.900)
RATE	0.197***	0.197***	0.213***	0.213***
	(0.009)	(0.009)	(0.011)	(0.011)
SIZE	-0.100***	-0.099***	-0.110***	-0.111***
	(0.024)	(0.024)	(0.028)	(0.028)
DRISK	0.232***	0.234***	0.286***	0.286***
	(0.061)	(0.061)	(0.072)	(0.072)
ILLIQUID	0.050	0.049	0.048	0.048
	(0.033)	(0.033)	(0.033)	(0.033)
Year fixed effects	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included
Adjusted R^2	0.798	0.802	0.807	0.810
N	69,400	69,400	38,232	38,232

*, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors clustered by firm and year are shown in parentheses. The coefficients on year and industry indicators are suppressed for brevity. *MATURITY* is the maturity of the CDS contract. $MATURITY^2$ is the squared maturity of the CDS contract. Other variables are as defined in Appendix 2.

TABLE 8
Additional analysis based on the magnitude of new information

Panel A: Firms that do not provide voluntary risk disclosures before the mandate		**Panel B:** The first RFDs in 10-Ks provided by firms after the mandate	
Dependent variable: Δ*SPRD*		Dependent variable: Δ*SPRD*	
Intercept	0.056	*Intercept*	0.085***
	(0.025)		(0.026)
MAN	-0.172***	*FIRSTMAN*	-0.207***
	(0.064)		(0.015)
NONVOL	0.005	*MANADJ*	-0.042**
	(0.013)		(0.017)
MAN×NONVOL	-0.011*		
	(0.006)		
Δ*ROA*	-1.590**	Δ*ROA*	-1.057***
	(0.642)		(0.359)
Δ*LEV*	-0.051	Δ*LEV*	-0.042
	(0.099)		(0.067)
Δ*SPOT*	-0.000	Δ*SPOT*	0.001
	(0.241)		(0.046)
Δ*STDRET*	1.890	Δ*STDRET*	1.747
	(3.208)		(1.083)
POSRATE	-0.025	*POSRATE*	-0.015
	(0.049)		(0.029)
NEGRATE	-0.004	*NEGRATE*	0.002
	(0.049)		(0.028)
Δ*SIZE*	-0.409***	Δ*SIZE*	-0.403***
	(0.051)		(0.040)
Δ*DRISK*	0.124	Δ*DRISK*	0.144**
	(0.112)		(0.059)
Δ*ILLIQUID*	0.021	Δ*ILLIQUID*	0.035**
	(0.019)		(0.017)
Year fixed effects	Included	Year fixed effects	Included
Industry fixed effects	Included	Industry fixed effects	Included
Interaction of control variables with *NONVOL*	Included	*p*-value for *FIRSTMAN=MANADJ*	0.000
Adjusted R^2	0.142	Adjusted R^2	0.146
N	7,504	N	7,504

*, **, and *** represent significance levels of 0.10, 0.05, and 0.01 (two-tailed), respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors clustered by firm are shown in parentheses. The coefficients on year and industry indicators are suppressed for brevity. *NONVOL* is an indicator variable that equals one if the firm does not provide voluntary risk disclosures in 10-Ks before the SEC mandate, and zero otherwise. *FIRSTMAN* is an indicator variable that equals one for the first time that the firm includes the risk factor section in the 10-K after the SEC mandate, and zero otherwise. *MANADJ* is an indicator variable that equals one for firm-quarters following the first 10-K that contains the risk factor section after the SEC mandate, and zero otherwise. Other variables are as defined in Appendix 2.

TABLE 9
Event study analysis

Dependent variable: Δ*SPRD3D*	
Intercept	-0.004
	(0.003)
MAN	-0.008***
	(0.002)
UE	-0.102
	(0.073)
RET	-0.136***
	(0.025)
STDRET	-0.052
	(0.083)
SP500RET	-0.420***
	(0.056)
Δ*SPOT3D*	-0.047**
	(0.020)
Δ*VIX*	0.027***
	(0.009)
Year fixed effects	Included
Industry fixed effects	Included
Adjusted R^2	0.060
N	7,655

** and *** represent significance levels of 0.05 and 0.01 (two-tailed), respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors clustered by firm are shown in parentheses. The coefficients on year and industry indicators are suppressed for brevity. Δ*SPRD3D* is the change in CDS spreads during the three-day window centered on the SEC filing date, computed as the CDS spread on the last day of the window divided by the spread on the first day of the window minus one. *UE* is unexpected earnings, calculated as actual I/B/E/S earnings minus the median analysts' forecast, scaled by the stock price at the end of the quarter. *RET* is the stock return during the three-day window centered on the SEC filing date. *SP500RET* is the S&P 500 index return during the three-day window centered on the SEC filing date. Δ*SPOT3D* is the change in the one-year T-bill rates during the three-day window centered on the SEC filing date. Δ*VIX* is the change in the S&P 500 implied volatility index during the three-day window centered on the SEC filing date. Other variables are as defined in Appendix 2.

TABLE 10
Firm fixed effects and DiD analysis

Panel A: Firm fixed effect analysis		**Panel B:** DiD analysis	
Dependent variable: *SPRD*		Dependent variable: *SPRD*	
Intercept	3.530***	*Intercept*	4.232***
	(0.235)		(0.598)
MAN	-0.071***	*MAN*	-0.020
	(0.013)		(0.025)
		TREAT	0.131***
			(0.023)
		MAN×TREAT	-0.086***
			(0.028)
ROA	-1.882***	*ROA*	-0.264
	(0.407)		(0.661)
LEV	0.204**	*LEV*	0.197
	(0.098)		(0.203)
SPOT	-0.105***	*SPOT*	-0.127***
	(0.008)		(0.019)
STDRET	4.029***	*STDRET*	1.969
	(1.115)		(1.789)
RATE	0.016	*RATE*	0.032**
	(0.010)		(0.016)
SIZE	-0.214***	*SIZE*	-0.268***
	(0.020)		(0.040)
DRISK	0.030	*DRISK*	0.033
	(0.030)		(0.043)
ILLIQUID	0.043***	*ILLIQUID*	0.057
	(0.014)		(0.044)
Lagged SPRD	0.581***	*Lagged SPRD*	0.512***
	(0.016)		(0.053)
Year fixed effects	Included	Year fixed effects	Included
Firm fixed effects	Included	Firm fixed effects	Included
		p-value for *MAN*+*MAN*×*TREAT*=0	0.001
Adjusted R^2	0.927	Adjusted R^2	0.948
N	7,504	N	3,730

** and *** represent significance levels of 0.05 and 0.01 (two-tailed), respectively. All continuous variables are winsorized at the 1st and 99th percentiles. Robust standard errors clustered by firm are shown in parentheses. The coefficients on year and firm indicators are suppressed for brevity. *TREAT* is an indicator variable that equals one for U.S. firms (i.e., the treatment sample), and zero otherwise. Other variables are as defined in Appendix 2.

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