

VOLUNTARY RISK-RELATED DISCLOSURES

by

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(Under the Direction of Stephen P. Baginski)

ABSTRACT

This study investigates two related questions: 1) What are the properties of voluntary market risk-related disclosures outside of the annual report? and 2) What firm characteristics are associated with voluntary disclosure of information about market risk outside of the annual report? I examine disclosures in press releases relating to foreign exchange and interest rate fluctuations from 2001 to 2003.

Despite calls for increased voluntary risk-related disclosures, I find that only 12% of firms issue voluntary foreign exchange and interest rate risk-related disclosures during the sample period. Most of these disclosures accelerate (rather than expand) information that subsequently appears in the mandated risk disclosures in the annual report. However, I also document that voluntary risk disclosures are less precise and more likely to contain upside risk-related information than mandated risk disclosures.

I find that large firms with high exposure to foreign exchange and interest rate risk, significant institutional ownership, and low information asymmetry are more likely to issue voluntary risk disclosures. These firms are most likely to benefit from transparent risk disclosure. On the other hand, firms with an earnings decrease, firms with higher systematic risk, higher risk of litigation, those in technology industries and firms issuing equity are less

likely to issue risk disclosures. These firms are likely concerned about drawing investor attention to external market risks beyond management control. As standard setters continue to reform market risk-related disclosure requirements, evidence on the incidence and characteristics of voluntary risk disclosures informs standard setters of what disclosures firms choose to make or accelerate within the period.

INDEX WORDS: Voluntary disclosure, Risk, Interest rate, Foreign exchange rate

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DEDICATION

To Shayne: I could not have done this without your support and encouragement. Thank you for sharing all of life's adventures with me.

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CHAPTER 1

INTRODUCTION

Limitations of mandated risk-related disclosures create demand for voluntary disclosures of risk-related information. Whether and how firms respond to this demand is of interest to managers, investors, researchers, and policy makers, but the limited empirical evidence to date focuses only on mandated disclosures in annual reports. To address this void in the literature, I investigate two questions: “What are the properties of voluntary disclosures about market risk outside of the annual report?” and “What characteristics are associated with voluntary disclosure of information about market risk outside of the annual report?”¹

After the market suffered several risk-related scandals (e.g., Barings and Procter & Gamble), investors began demanding additional risk-related disclosures (Schrand and Elliott, 1998). While a few firms were providing some qualitative disclosures about risk within the annual report, firms seemed reluctant to issue quantitative risk-related disclosures (Roulstone, 1999). As a result of the increasing demand for risk information in financial reports, Scholes (1996) encouraged accountants to develop an accounting system focused on risk exposures, emphasizing how the financial position changes as a result of foreign exchange, interest rate, and commodity risks.

¹ Consistent with definitions of risk used by the Securities and Exchange Commission and Linsmeier, Thornton, Venkatachalam, and Welker (2002), I define market risk as the distribution around expected earnings caused by changes in market rates (e.g., fluctuations in foreign exchange and interest rates). I define voluntary risk disclosures as disclosures that can help reduce investor uncertainty about market risk either in general or with respect to firm performance measures (e.g., earnings).

In an initial move toward a more risk-focused accounting system, in 1997 the SEC issued Financial Reporting Release (FRR) No. 48, which mandates qualitative and quantitative *ex ante* disclosures about risk of *loss* due to adverse changes in market rates (e.g., exchange rates and interest rates) or prices.² Even after FRR No. 48, investors still had little information about the specific impact of financial instruments on earnings (Roulstone, 1999). Although FRR No. 48 requires *ex ante* risk disclosures, financial statements provided little information on *ex post* risk realization. The Financial Accounting Standards Board (FASB) subsequently issued Statement of Financial Accounting Standard (SFAS) No. 133, which requires managers to report audited *ex post* (i.e., realized) risk information in the financial statements and footnotes.³

Although Schrand and Elliott (1998) question whether managers have incentives to issue voluntary risk-related disclosures (because there is no archival evidence that risk disclosure reduces cost of capital), Jorgensen and Kirschenheiter's (2003) analytical model suggests that managers have incentives (e.g., decreased beta and increased stock price) to voluntarily disclose information about firm-specific risk. Moreover, investors continue to complain that risk disclosures under FRR No. 48 and SFAS No. 133 are not transparent (Centre for Financial Market Integrity, 2005), and Graham, Harvey, and Rajgopal's (2005) survey of corporate executives suggests that managers issue voluntary disclosures to address deficiencies in

² Linsmeier, Thornton, Venkatachalam, and Welker (2002) and Koonce, Lipe, and McAnally (2005) show that investors use these mandatory FRR No. 48 *ex ante* disclosures. While FRR No. 48 requires downside risk disclosures, it permits upside risk disclosures. Managers must report unaudited risk information in the Management's Discussion and Analysis (MD&A) section of the annual report.

³ In June 1998, FASB issued SFAS No. 133, which became effective for fiscal years beginning after June 15, 2000. SFAS No. 133 was amended by SFAS No. 137, SFAS No. 138, SFAS No. 140, SFAS No. 141, SFAS No. 149, SFAS No. 150, and SFAS No. 155. These standards require all derivative instruments be carried on the balance sheet at fair value and any changes in fair value be recognized in income, unless the instrument qualifies for hedge accounting. In December 2006, the FASB issued a Proposed Statement of Financial Accounting Standards, "Disclosures about Derivative Instruments and Hedging Activities – an amendment of FASB Statement No. 133" to further address risk disclosure. The FASB decided that firms need to inform investors about how they account for financial instruments and why financial instruments are used. Also, the FASB wants more transparency of the overall impact of derivatives on firms' financial position, earnings, and cash flows.

mandatory reporting. I therefore expect firms to respond to investors' continued demands for information about firm risk by issuing voluntary disclosures outside of the annual report.

Voluntary disclosure allows firms to construct risk-related disclosures to trade off firm-specific costs and benefits of disclosure. Firms are not restricted to orientation of the disclosure (*ex ante* or *ex post*), asymmetric disclosure (i.e., *ex ante* disclosures of downside risk as in FRR No. 48), particular forms of disclosure (e.g., quantitative as called for by investors and regulators versus qualitative as discovered by Roulstone (1999) in pre-FRR No. 48 annual report disclosures), and object of disclosure (e.g., free-standing information about risk or explanations of how risk affects earnings). Evidence on the incidence, properties, and determinants of voluntary risk disclosures informs standard setters of firms' disclosure in an unregulated press-release environment.⁴ Knowledge of these disclosures should help standard setters focus risk regulation revisions on disclosures firms are capable of providing under the current accounting system.

I focus on voluntary disclosure about two specific risks: foreign exchange and interest rate fluctuations. Other than beta, firms list exchange rate risk, interest rate risk, business cycle risk, and inflation risk as the most important sources of risk (Graham and Harvey, 2001). The economic importance of foreign exchange and interest rate risk is obvious given that, in 2003, foreign exchange and interest rate instruments comprised \$27 trillion of the worldwide notional or contract amounts for non-financial firms' risk instruments (Bank for International Settlements, 2004). Furthermore, variation in foreign exchange rates and interest rates ultimately affects firm

⁴ My evidence relates to choices managers make in unregulated disclosures but not in an unregulated system. Mandated risk disclosures exist, and thus, managers' choices about risk disclosures in an unregulated venue (i.e., press releases) are made within a regulated system.

earnings. Prior literature has shown that accounting earnings variability is the accounting variable most strongly related to systematic risk and total risk (Ryan, 1997).⁵

I hand-collect a sample of voluntary foreign exchange and interest rate risk-related disclosures using a keyword search of press releases from 2001 to 2003. Only 12% of firms issue voluntary foreign exchange and interest rate risk-related disclosures during the sample period. (In contrast, Anilowski, Feng, and Skinner (2007) find that roughly 25% of firms issue management earnings forecasts during my sample period.) My study informs standard setters that despite calls for increased voluntary risk disclosure, few firms provide additional information beyond the required disclosures.

To investigate how firms manage disclosures to influence investor perceptions about how foreign exchange and interest rate fluctuations ultimately affect earnings, I investigate four properties of these voluntary risk-related disclosures: orientation (i.e., whether disclosures are *ex ante* or *ex post*), type of news, precision, and link to firm operations. First, I find that most voluntary risk disclosures (67%) provide *ex post* information, consistent with the focus of SFAS No. 133's *historical* disclosures, and Ryan's (1997) view that the accounting system's comparative advantage is providing *ex post* risk realizations that are verifiable and auditable. He notes that evidence on existing risk disclosures can help standard setters as they continue to revise risk disclosure requirements, by focusing attention on risk disclosures the accounting system is best able to provide. Second, FRR No. 48 requires downside risk disclosures, while permitting upside disclosures. However, in Jorgensen and Kirschenheiter's (2003) analytical model, firms are more likely to voluntarily disclose favorable risk information. I find that voluntary risk disclosures in press releases include both upside (47%) and downside (53%) risk

⁵ Mandated risk disclosures predominantly focus on risks associated with derivative instruments. My study encompasses both derivative users and non-derivative users that are affected by interest rate changes and foreign exchange rate fluctuations.

information, which indicates that disclosing firms are willing to provide fairly symmetric risk-related disclosures outside the annual report. I find no association between disclosure orientation (*ex ante* versus *ex post*) and disclosure news (good versus bad), indicating that voluntary disclosures provide more symmetric *ex ante* risk-related information than firms must provide under FFR No. 48 within the MD&A. Third, current standards require quantitative risk disclosures, and investors continue to demand increased quantitative risk disclosures (Centre for Financial Market Integrity, 2005). However, managers may instead prefer to issue unauditable, qualitative disclosures of uncontrollable risks. Consistent with Roulstone's (1999) finding that firms seem reluctant to voluntarily issue quantitative risk disclosures in annual reports, I find that managers are reluctant to issue quantitative disclosures in voluntary press releases: 70% of voluntary risk disclosures are qualitative. Finally, the Centre for Financial Market Integrity (2005, 47) states that investors want information to help them understand, "how the company's risk exposures ... might affect the company's operations and financial position." I find that firms usually issue voluntary risk-related disclosures as part of an earnings announcement press release (42% of voluntary risk disclosures), a management earnings forecast press release (10%), or both (38%). Only 10% of voluntary risk disclosures are free-standing. This finding suggests that firms provide risk disclosures to help market participants interpret the reported results of firm operations.

I also investigate determinants of voluntary risk disclosure. If risk information is important to investors, firms that issue these disclosures could distinguish themselves as transparent risk disclosers. Consistent with Jorgensen and Kirschenheiter's (2003) analytical prediction that disclosing firms have lower betas *ex post* than non-disclosing firms, I find that voluntary risk disclosers with greater exposure to interest rate and foreign exchange risk enjoy

lower betas. Risk disclosing firms are also larger, with more institutional ownership and lower information asymmetry. These firms are most likely to benefit from transparent risk disclosure that could help maintain low information asymmetry and beta, while meeting the demands of institutional owners. On the other hand, firms with an earnings decrease, firms with higher systematic risk, higher risk of litigation, and in technology industries are less likely to issue foreign exchange and interest rate risk-related disclosures. Firms attempting to obtain external financing through equity issuance are also less likely to issue risk disclosures. These firms are likely concerned about drawing investor attention to external market risks beyond management control, even though risk disclosures by these firms would likely be useful to investors.

My study contributes to the literature in several ways. First, prior voluntary disclosure research focuses on why managers provide and how investors use voluntary disclosures about the first moment of the earnings distribution (the level of expected earnings). This study is the first to document the incidence and determinants of disclosures relating to the second moment of the earnings distribution, the risk of earnings realization. Second, investors expect managers to identify and manage risk exposures (Bodnar and Gebhardt, 1999), and my study extends the risk literature by showing how managers have voluntarily responded to calls for increased transparency about risk within the accounting system (Scholes, 1996). Despite calls for increased transparency, I find that few firms issue voluntary foreign exchange and interest rate risk disclosures. Although my results suggest similarities between determinants of voluntary risk disclosures and voluntary earnings forecasts (i.e., firm size, institutional ownership, and leverage are positively associated with risk disclosure), I find several differences as well. Firms with an earnings decrease, firms issuing equity, high-tech firms, and firms with higher litigation risk are more likely to issue voluntary earnings forecasts but less likely to issue voluntary risk

disclosures, as if these firms' managers do not want to draw investor attention to additional risks that are largely outside their control.

Finally, the results of my study inform both the FASB and the International Accounting Standards Board (IASB) that few firms provide voluntary risk disclosures. Voluntary risk disclosures outside of annual reports are similar to mandated disclosures in annual reports in terms of *ex post* orientation and link to firm operations. This finding suggests that voluntary risk disclosure is more likely intended to accelerate disclosure of the (especially, *ex post*) effects of market risks on current period operations than to remedy deficiencies in the substance of the mandated disclosures. However, there are two substantive differences between voluntary risk disclosures vis-à-vis mandatory risk disclosures in the annual report: (1) Most voluntary risk disclosures are qualitative, whereas mandatory risk disclosures are generally quantitative, and (2) management is more willing to provide *ex ante* good news disclosures outside the annual report.

The remainder of this paper is organized as follows. In section 2, I document the properties of voluntary risk disclosure. In section 3, I use the voluntary disclosure and risk management literature to suggest determinants of voluntary risk disclosures and I develop tests relating to these determinants. In section 4, I present my results. In section 5, I include sensitivity tests, and Section 6 concludes the paper.

CHAPTER 2

PROPERTIES OF VOLUNTARY RISK DISCLOSURE

Given the importance of risk-related disclosure to the capital markets and the paucity of evidence on the extent and nature of voluntary risk disclosure, this section documents the properties of voluntary risk disclosure. Each of the questions examined in this section addresses how firms voluntarily create a disclosure system to influence investor perception about how foreign exchange and interest rate fluctuations ultimately affect earnings. The results directly inform policymakers whether and how companies voluntarily utilize risk disclosure.

2.1 Sample Selection and Data

I collect voluntary risk disclosures for non-financial, non-energy firms⁶ in press releases from Dow Jones News Service (DJNS) for 2001 to 2003.⁷ I select 2001 to 2003 because FRR No. 48, Regulation Fair Disclosure (Reg FD) (SEC, 2000), and SFAS No. 133 were implemented prior to 2001.⁸ My DJNS search keywords are: “foreign exchange,” “exchange rate,” “foreign currency,” and “interest rate”.⁹

I read each press release to determine if a voluntary risk-related disclosure is present, noting the precision of the risk disclosure. I record a risk disclosure as quantitative if it provides

⁶ I exclude financial institutions and real estate firms (“Banking/Credit,” “Insurance,” “Investing/Securities,” and “Construction/Real Estate”) because regulators require additional risk disclosures in these industries. I also exclude energy firms because they often trade in the commodity derivatives market, and I am not examining commodity disclosures. Studying these industries is beyond the scope of this paper.

⁷ Dow Jones News Service includes Dow Jones Newswires and Press Release Wires.

⁸ In 2000, the SEC issued Reg FD to ensure that all market participants have access to any material disclosures. Prior to Reg FD, firms often provided private disclosures to certain market participants (e.g., analysts). After Reg FD, if material information is disclosed, it must be disclosed to all market participants.

⁹ I also use wildcard terms to capture variations of these keywords. For example, I use the term “foreign curren*” which captures “foreign currency” and “foreign currencies”.

a point, range, or open-ended numerical value for the effect foreign exchange or interest rate risk has on earnings, revenue, or another income statement component. I code other disclosures as qualitative.

I also identify whether the voluntary risk-related disclosures included in each press release provide upside risk (good news) or downside risk (bad news) information. I classify a qualitative or a quantitative risk disclosure as good news if it (1) refers to a decrease of foreign exchange or interest rate volatility or (2) has a positive effect on either explained or forecasted earnings. Likewise, I classify a risk disclosure as bad news if it (1) refers to an increase in volatility or (2) has a negative effect on earnings. I eliminated 35 ambiguous disclosures made by 29 firms.¹⁰ The Appendix includes examples of voluntary risk disclosures.

I gather forward-looking (*ex ante*) risk disclosures that allow investors to understand how risk *might* change a company's operating and financial positions.¹¹ I also gather historical (*ex post*) risk disclosures that explain how risk *has* affected a firm. Finally, I record whether the voluntary risk disclosure is bundled with a management earnings forecast and/or an earnings announcement.

2.2 Incidence of Voluntary Risk Disclosure

I first document the tendency for firms to issue voluntary foreign exchange and/or interest rate risk-related disclosures. All firms are affected by movements in currency and interest rates. Deficiencies in timing and/or substance of mandatory disclosure requirements create investor demand for voluntary risk-related disclosures. Even though FRR No. 48 requires

¹⁰ Ambiguous disclosures did not fall into any of these coding categories. For example, if a company just mentioned that interest rates affect their firm but did not specify the effect or discuss the changes in interest rates, it is removed from the sample.

¹¹ *Ex ante* disclosures refer to how future earnings will be affected by rate changes and/or expectations about future rates and their effect on earnings.

ex ante risk disclosures in the annual report, the disclosures may not be sufficient for investors to understand the effects of market risk on current quarterly earnings (e.g., third quarter earnings of the year following the FRR No. 48 disclosures). Furthermore, SFAS No. 133 *ex post* disclosures may not be sufficiently timely in providing risk information investors want for current firm valuation. If managers believe the disclosure standards have substantive deficiencies (e.g., FRR No. 48 does not require *ex ante* upside risk information), then I expect managers to voluntarily issue risk disclosures outside of the annual report.

Table 2.1, Panel A presents evidence on the incidence of voluntary risk disclosure. After excluding firms with missing Compustat cusips, the sample selection yielded 537 unique firms that issue voluntary risk-related disclosures. There are 3,884 unique remaining risk non-disclosing firms (excluding financial and energy firms) with sufficient information from Compustat. Thus, during my 2001 to 2003 sample period, approximately 12% of firms voluntarily disclosed risk information. To investigate if firms with higher foreign exchange and interest rate exposures are more likely to issue voluntary risk disclosures, I narrow my sample to firms with higher foreign exchange and interest rate risks. I classify firms as having higher foreign exchange risk if foreign sales are greater than the sample mean foreign sales. Likewise, I classify firms as having higher interest rate risk if leverage is greater than the sample mean leverage. I find that 17% of firms with both high foreign exchange and interest rate risk issue voluntary risk disclosures. I find that 12% of firms with higher foreign exchange exposure and 8% of firms with higher interest rate risk exposure issue voluntary risk disclosures. Thus, although firms with higher market risk are more likely to issue voluntary risk disclosures than other firms, voluntary risk-related disclosures remain infrequent.

Panel B reports the number of voluntary risk disclosures per firm during the sample period. Most risk-disclosing firms (56%) issue only one voluntary risk disclosure from 2001 to 2003. Panel C shows disclosing firms issued 1,291 risk disclosures during the sample period.¹² The Panel C “TOTAL” column shows that the majority of risk disclosures relate to foreign exchange risk (71%). Firms issue fewer interest rate risk disclosures (29%).

Managers’ sporadic voluntary risk disclosure is consistent with sporadic voluntary disclosure of earnings and cash flow forecasts. In fact, Anilowski, Feng, and Skinner (2007) find that roughly 25% of firms issue management earnings forecasts during my sample period. Wasley and Wu (2006) find that only approximately 2% of firms issue cash flow forecasts during my sample period. Thus, voluntary disclosure of risk information occurs about half as often as voluntary disclosure of earnings forecasts but far more often than voluntary disclosure of cash flow forecasts.

2.3 Ex Ante and Ex Post Voluntary Risk Disclosure

Second, I examine the incidence of *ex ante* versus *ex post* voluntary risk disclosures. Ryan (1997, 85) considers whether the accounting system should “provide *ex post* realizations of current investment and past performance or *ex ante* distributions of future values.” The current accounting system is almost entirely *ex post*, and both Ryan (1997) and Schrand and Elliott (1998) argue that the comparative advantage of an *ex post* system is its verifiability and auditability. Also, Roulstone (1999) notes that investors want information about *ex post* risk realizations, and firms were not providing this information within the annual report. Without *historical* disclosures, investors are not able to evaluate management’s overall risk strategy and

¹² For each press release, I separately code unique risk disclosures. For example, a press release might contain an *ex ante*, foreign exchange risk disclosure and an *ex post*, interest rate risk disclosure. The coding scheme counts this as two disclosures.

determine if management's strategies have been successful in the past. *Ex post* disclosures allow investors to understand how risk has affected a firm and might likely affect the firm in the future.

However, Schrand and Elliott (1998) argue that optimal risk disclosure would include both *ex ante* and *ex post* risk information. Although Ryan (1997) questions the comparative advantage of *ex ante* risk disclosures, *ex ante* risk disclosures help investors understand risks a firm expects to face and how future earnings will be affected. Thus, when the SEC issued FRR No. 48 in 1997, the focus was on providing market participants with forward-looking or *ex ante* information about a firm's risk of loss due to changes in market rates, even though *ex ante* disclosures are more subject to error than *ex post* disclosures, simply because they are forward-looking. I document the incidence of *ex ante* disclosures (more closely aligned with FRR No. 48) and *ex post* disclosures (more closely aligned with SFAS No. 133) to describe disclosure choices in an unregulated venue.

As shown in the "TOTAL" column in Table 2.2, 430 (33%) of the 1,291 risk disclosures are *ex ante* disclosures and 861 (67%) are *ex post* disclosures. The majority of foreign exchange risk disclosures are *ex post* (75% in total, significantly greater than 50% in each sample year, $p < 0.0001$). In contrast, just over half (54%) of the interest rate risk disclosures are *ex ante*, driven by a large proportion of *ex ante* interest rate risk disclosures in 2001 (64%, $p = 0.0018$). *Ex ante* interest rate risk disclosures often refer to a firm's expectation that falling interest rates will allow the firm to refinance at a lower interest rate, and interest expense will fall. During 2001, the prime rate fell from 9.5% to 5.0% and remained at low levels in 2002 and 2003 (Federal Reserve Board, 2006b).

These voluntary disclosure patterns are consistent with the belief that a relevance versus reliability tradeoff favors *ex post* risk-related disclosure. However, firms' disclosure of *ex ante*

information in more timely (and unregulated) press releases combined with the fact that mandated *ex ante* disclosure is asymmetric motivates further analysis of the type of *ex ante* information in these disclosures.

2.4 Voluntary Risk Disclosure News

FRR No. 48 requires firms to disclose *ex ante downside* risk whereas SFAS No. 133 requires firms to provide *ex post symmetric* (both good and bad news) disclosures. Therefore, I examine whether firms engage in downside or symmetric voluntary disclosures of risk-related information. Consistent with managers' tendency to provide more bad than good news *ex ante* (i.e., forecasted) earnings (Anilowski, Feng, and Skinner, 2007; Bamber and Cheon, 1998; and Skinner, 1994), Koonce, Lipe, and McAnally (2005) note that managers do not voluntarily provide *ex ante*, good news risk-related information in the MD&A risk disclosures. However, Jorgensen and Kirschenheiter's (2003) model suggests that firms are more likely to disclose future cash flows with low variance (favorable information) than future cash flows with high variance. Thus, in Jorgensen and Kirschenheiter's setting, managers are more likely to disclose favorable than unfavorable risk-related information. If managers wish to disclose favorable risk-related information but are hesitant to provide good news risk disclosures in the MD&A, which is examined by both auditors and regulators, managers may choose another venue in which to make the favorable disclosures.

Interestingly, in contrast to firms' reluctance to voluntarily disclosing good news in the annual report, firms provide good news outside the annual report. Table 2.3, Panel A "TOTAL" column shows that 47% of the risk disclosures voluntarily provided outside of the annual report

is good news. However, the majority of voluntary risk disclosures still convey bad news or downside risk (53%, difference significant at $p = 0.0194$ in a binomial test).

Risk disclosure news patterns can either reflect changes in market rates or how successful risk management has counteracted changes in market rates. As Table 2.3, Panel A shows, on average, the foreign exchange rate disclosure news is negative (55%). However, the news changes from 2001, where the disclosures are predominantly bad news (92%), to 2003, where the disclosures are predominantly good news (88%). The Federal Reserve Bank's Broad Index which tracks the value of the U.S. dollar shows that the U.S. dollar strengthens during 2001, which is bad news for U.S. exporters (Federal Reserve Board, 2006a). I find significantly more bad news foreign exchange risk disclosures in 2001 (92%). The U.S. dollar weakens in 2002 and 2003; thus, there are fewer bad news risk disclosures than in 2001. This finding suggests that firms choosing to voluntarily disclose foreign exchange risk information likely export U.S. goods and services and that their disclosure news patterns follow changing market rates.¹³

Interest rate risk-related disclosure news exhibits no overall difference between good news and bad news interest rate risk, and the differences between good news and bad news are insignificant during each sample year. The prime rate fell during 2001 and remained at historically low levels during 2002 and 2003 (Federal Reserve Board, 2006b).¹⁴

Policymakers have created a system where *ex ante* good news disclosure is not required although *ex ante* bad news and *ex post* symmetric disclosures are required. Given this asymmetry in disclosure requirements, I examine the relation between risk disclosure orientation (*ex ante* or *ex post*) and disclosure news. As shown in Panel B, there is no association between disclosure orientation and news ($p = 0.8904$ in a χ^2 test of independence). Thus, outside the

¹³ In Section 3, I find that firms with more foreign sales are more likely to issue voluntary risk disclosures.

¹⁴ Interest rate risk is likely associated with leverage. In Section 3, I find that firms with higher leverage are more likely to issue voluntary risk disclosures.

annual report's MD&A, firms are willing to issue good news *ex ante* and *ex post* risk information in the same proportion they issue bad news *ex ante* and *ex post* risk information.

Even though firms are willing to provide symmetric *ex ante* voluntary risk disclosures, only approximately 7% (untabulated) of my voluntary risk disclosure sample are forward-looking, quantitative disclosures. As shown in Table 2.3, Panel C, the majority of quantitative *ex ante* risk disclosures are negative (72%, $p < 0.0001$). My results imply that managers are willing to provide *ex ante* symmetric voluntary risk disclosures as long as they can issue qualitative disclosures for good news. However, if firms report bad earnings news, perhaps they will issue a quantitative risk disclosure to blame a specific external market force, similar to what occurs when firms use external attributions with management earnings forecasts (Baginski, Hassell, and Kimbrough, 2004).

In summary, voluntary risk-related disclosures are predominantly negative, especially quantitative, *ex ante* disclosures and disclosures about foreign exchange risk. This finding is consistent with FRR No. 48 disclosure requirements. However, firms are willing to provide symmetric *ex ante* voluntary risk disclosure outside the annual report but only if they can issue qualitative disclosures. Most quantitative *ex ante* voluntary risk disclosures convey bad news.

2.5 Precision of Voluntary Risk Disclosure

Given that managers cannot control foreign exchange and interest rate fluctuations, they may issue unauditable, qualitative disclosures to explain current earnings or to provide context for future earnings. Issuing qualitative disclosures allows managers to avoid making quantitative disclosures that turn out to be inaccurate, *ex post*. On the other hand, qualitative disclosures convey a lack of knowledge about how risks specifically have affected or will affect the firm. If

a firm issues a quantitative disclosure, it may be more likely to issue *ex post* disclosures than *ex ante* disclosures. Accordingly, I provide evidence on the precision of risk-related disclosures issued outside of the annual report.¹⁵

Voluntary disclosures range in specificity from general impressions to quantitative, point forecasts. Table 2.4, Panel A “TOTAL” column shows that only 30% of voluntary risk disclosures are quantitative, while 70% are qualitative ($p < 0.0001$). Panel B reports that 23% of *quantitative* disclosures are *ex ante*; whereas, 77% of *quantitative* disclosures are *ex post*. Thus, managers are more willing to disclose *ex post*, quantitative risk information than they are *ex ante*, quantitative risk information. Similarly, 341 *ex ante* disclosures are qualitative; whereas, 89 *ex ante* disclosures are quantitative, suggesting that managers are more willing to provide forward-looking, qualitative risk disclosures than they are to provide forward-looking, quantitative risk disclosures. The orientation of the risk disclosure (*ex ante* or *ex post*) is associated with disclosure precision ($p < 0.0001$ in a χ^2 test of independence).

Recently, Hutton, Miller, and Skinner (2003) show that managers provide verifiable forward-looking disclosures with some good news earnings forecasts. On the other hand, they find that the information provided with bad news earnings tends to be soft, suggesting that managers change the precision of supplemental disclosures based on disclosure news. However, in a risk setting, Panel C shows that the majority of quantitative risk disclosures are bad news disclosures (61%); whereas, qualitative disclosures are evenly divided between bad news (50%) and good news (50%) disclosures.¹⁶ A chi-square test of independence shows that the news in quantitative and qualitative risk disclosures is proportionally different ($p = 0.0002$), suggesting

¹⁵ Previous risk disclosure research has focused on mandatory risk disclosures in the financial statements, which include detailed, quantitative risk information (e.g., Linsmeier, Thornton, Venkatachalam, and Welker, 2002; Koonce, Lipe, and McAnally, 2005; Koonce, McAnally, and Mercer, 2005; and Ahmed, Kilic, and Lobo, 2006).

¹⁶ Qualitative risk disclosure news is more subject to judgment in the coding process, which could potentially bias the comparison of qualitative and quantitative disclosure news.

that perhaps managers are more willing to use quantitative disclosures to place blame on an adverse external economic condition.

Panel D reports that the majority of quantitative risk disclosures (94%) are point disclosures that provide a specific dollar amount for the foreign exchange or interest rate risk effect on a particular financial statement item. Panel E shows that the majority of quantitative disclosures discuss the effect of risk on earnings (73%). Quantitative voluntary risk disclosures relate to revenue 23% of the time.

In summary, the majority of voluntary risk disclosures are qualitative or soft disclosures. However, if a firm issues a quantitative disclosure, it likely provides historical, bad news risk information about earnings.

2.6 Additional Information Bundled with Voluntary Risk Disclosure

Finally, what additional information is included with voluntary risk disclosures? Francis, Schipper, and Vincent (2002) find that earnings announcements have become more detailed over time, including more supplemental data. Managers may want to explain how their risk management policies have affected earnings. Also, Baginski, Hassell, and Kimbrough (2004) find that earnings forecasts are often accompanied by attributions, and voluntary foreign exchange and interest rate risk disclosures can be viewed as external management earnings forecast attributions. Managers can influence investor perceptions regarding how external forces affect earnings by using voluntary risk disclosures.

As shown in Table 2.5, “TOTAL” column, voluntary risk disclosures are included with earnings announcements 42% of the time, management earnings forecasts 10% of the time, and both management earnings forecasts and earnings announcements 38% of the time. Thus, the

majority of voluntary risk disclosures (80%) are included with earnings announcements and almost half (48%) are included with management earnings forecasts. Only 10% of voluntary risk disclosures are free-standing disclosures. Free-standing risk disclosures are more common for interest rate risk disclosures (24%) than for foreign exchange risk disclosures (5%). The results suggest that managers use voluntary risk disclosures to help investors interpret how external interest rate and foreign exchange fluctuations affected earnings or will affect future earnings.

2.7 Summary of Disclosure Properties

In summary, although investors continue to demand increased risk disclosure and standard setters have requested that firms voluntarily provide additional information beyond required disclosures, only 12% of firms issue voluntary foreign exchange and interest rate risk disclosures from 2001 to 2003. I find that firms' voluntary risk disclosure systems typically report qualitative, *ex post* risk-related information, often with earnings forecasts and announcements. Voluntary *ex ante* disclosures in press releases include good news which makes them more symmetric than the bad news disclosures made in the MD&A in accordance with FRR No. 48.

TABLE 2.1
Incidence of Voluntary Risk Disclosure

Panel A: Percentage of Firms Issuing Voluntary Risk Disclosures

	Risk-Disclosing Firms	Non-Disclosing Firms	Total Firms	% Disclosing
Total Sample	537	3,884	4,421	12%
Firms with Both Higher FX and IR Fluctuation Risk	110	531	641	17%
Firms with Higher Foreign Exchange Fluctuation Risk ^a	167	1,186	1,353	12%
Firms with Higher Interest Rate Fluctuation Risk ^b	180	2,033	2,213	8%

^aI classify a firm as having higher foreign exchange fluctuation risk when foreign sales are higher than the average total sample firm foreign sales.

^bI classify a firm as having higher interest rate fluctuation risk when firm leverage is higher than the average total sample firm leverage.

Panel B: Firms' Number of Voluntary Risk Disclosures Issued

	TOTAL	
	Firms	(%)
One Disclosure	301	(56%)
Two Disclosures	97	(18%)
Three Disclosures	47	(9%)
Four Disclosures	38	(7%)
Five Disclosures	16	(3%)
Six or More Disclosures	38	(7%)
	537	(100%)

Panel C: Firms' Risk Disclosures per Year

	2001		2002		2003		TOTAL	
	VRD	(%)	VRD	(%)	VRD	(%)	VRD	(%)
Foreign Exchange	344	(72%)	223	(59%)	346	(79%)	913	(71%)
Interest Rate	135	(28%)	153	(41%)	90	(21%)	378	(29%)
	479	(100%)	376	(100%)	436	(100%)	1,291	(100%)

TABLE 2.2
Ex Ante and Ex Post Voluntary Risk Disclosure

	2001		2002		2003		TOTAL	
Total								
Ex Ante	188	(39%)	141	(38%)	101	(23%)	430	(33%)
Ex Post	291	(61%)	235	(62%)	335	(77%)	861	(67%)
	479	(100%)	376	(100%)	436	(100%)	1,291	(100%)
<i>p-value*</i>	<i><0.0001</i>		<i><0.0001</i>		<i><0.0001</i>		<i><0.0001</i>	
Foreign Exchange								
Ex Ante	102	(30%)	66	(30%)	56	(16%)	224	(25%)
Ex Post	242	(70%)	157	(70%)	290	(84%)	689	(75%)
	344	(100%)	223	(100%)	346	(100%)	913	(100%)
<i>p-value*</i>	<i><0.0001</i>		<i><0.0001</i>		<i><0.0001</i>		<i><0.0001</i>	
Interest Rate								
Ex Ante	86	(64%)	75	(49%)	45	(50%)	206	(54%)
Ex Post	49	(36%)	78	(51%)	45	(50%)	172	(46%)
	135	(100%)	153	(100%)	90	(100%)	378	(100%)
<i>p-value*</i>	<i>0.0018</i>		<i>0.8716</i>		<i>1.0000</i>		<i>0.0891</i>	

**p*-value from a two-tailed binomial test that the frequency of *ex ante/ex post* is different from 50%.

TABLE 2.3
Voluntary Risk Disclosure News

Panel A: All Disclosures

	2001		2002		2003		TOTAL	
Total								
Good News	101	(21%)	158	(42%)	344	(79%)	603	(47%)
Bad News	378	(79%)	218	(58%)	92	(21%)	688	(53%)
	479	(100%)	376	(100%)	436	(100%)	1,291	(100%)
<i>p-value*</i>	<i><0.0001</i>		<i>0.0023</i>		<i><0.0001</i>		<i>0.0194</i>	
Foreign Exchange								
Good News	29	(8%)	80	(36%)	305	(88%)	414	(45%)
Bad News	315	(92%)	143	(64%)	41	(12%)	499	(55%)
	344	(100%)	223	(100%)	346	(100%)	913	(100%)
<i>p-value*</i>	<i><0.0001</i>		<i><0.0001</i>		<i><0.0001</i>		<i>0.0054</i>	
Interest Rate								
Good News	72	(53%)	78	(51%)	39	(43%)	189	(50%)
Bad News	63	(47%)	75	(49%)	51	(57%)	189	(50%)
	135	(100%)	153	(100%)	90	(100%)	378	(100%)
<i>p-value*</i>	<i>0.4913</i>		<i>0.8716</i>		<i>0.2461</i>		<i>1.0000</i>	

**p*-value from a two-tailed binomial test that the frequency of good news/bad news is different from 50%.

TABLE 2.3
Voluntary Risk Disclosure News
(continued)

Panel B: Ex Ante and Ex Post Risk Disclosures

	Good News		Bad News		TOTAL	
Ex Ante	202	(33%)	228	(33%)	430	(33%)
Ex Post	401	(67%)	460	(67%)	861	(67%)
	603	(100%)	688	(100%)	1,291	(100%)
<i>p-value of X^2 test of independence</i>	<i>0.8904</i>					

Panel C: Quantitative, Ex Ante Disclosures

Good News	25	(28%)
Bad News	64	(72%)
	89	(100%)
<i>p-value*</i>	<i><0.0001</i>	

**p*-value from a two-tailed binomial test that the frequency of good news/bad news is different from 50%.

TABLE 2.4
Voluntary Risk Disclosure Precision

Panel A: Quantitative and Qualitative Voluntary Risk Disclosure

	2001		2002		2003		TOTAL	
Total								
Quantitative	155	(32%)	107	(28%)	128	(29%)	390	(30%)
Qualitative	324	(68%)	269	(72%)	308	(71%)	901	(70%)
	479	(100%)	376	(100%)	436	(100%)	1,291	(100%)
<i>p-value*</i>	<0.0001		<0.0001		<0.0001		<0.0001	
Foreign Exchange								
Quantitative	128	(37%)	78	(35%)	104	(30%)	310	(34%)
Qualitative	216	(63%)	145	(65%)	242	(70%)	603	(66%)
	344	(100%)	223	(100%)	346	(100%)	913	(100%)
<i>p-value*</i>	<0.0001		<0.0001		<0.0001		<0.0001	
Interest Rate								
Quantitative	27	(20%)	29	(19%)	24	(27%)	80	(21%)
Qualitative	108	(80%)	124	(81%)	66	(73%)	298	(79%)
	135	(100%)	153	(100%)	90	(100%)	378	(100%)
<i>p-value*</i>	<0.0001		<0.0001		<0.0001		<0.0001	

**p*-value from a two-tailed binomial test that the frequency of quantitative/qualitative is different from 50%.

TABLE 2.4
Voluntary Risk Disclosure Precision
(continued)

Panel B: Ex Ante and Ex Post Risk Disclosure

	Quantitative		Qualitative	
Ex Ante	89	(23%)	341	(38%)
Ex Post	301	(77%)	560	(62%)
	390	(100%)	901	(100%)
<i>p-value of X^2 test of independence</i>	<i><0.0001</i>			

Panel C: Quantitative and Qualitative Disclosure News

	Quantitative		Qualitative	
Good News	152	(39%)	451	(50%)
Bad News	238	(61%)	450	(50%)
	390	(100%)	901	(100%)
<i>p-value of X^2 test of independence</i>	<i>0.0002</i>			

Panel D: Quantitative Disclosure Precision

Point	367	(94%)
Range	23	(6%)
Other	0	(0%)
	390	(100%)

Panel E: Income Statement Item Affected by Quantitative Disclosures

Earnings	284	(73%)
Revenue	91	(23%)
Other	15	(4%)
	390	(100%)

TABLE 2.5
Additional Information Bundled with Voluntary Risk Disclosures

	2001		2002		2003		TOTAL	
Total								
VRD bundled only with EA	209	(44%)	150	(40%)	180	(41%)	539	(42%)
VRD bundled only with MEF	58	(12%)	42	(11%)	30	(7%)	130	(10%)
VRD with both MEF & EA	164	(34%)	140	(37%)	188	(43%)	492	(38%)
VRD with neither MEF or EA	48	(10%)	44	(12%)	38	(9%)	130	(10%)
	479	(100%)	376	(100%)	436	(100%)	1,291	(100%)
Foreign Exchange								
VRD bundled only with EA	156	(45%)	86	(39%)	155	(45%)	397	(43%)
VRD bundled only with MEF	37	(11%)	26	(12%)	20	(6%)	83	(9%)
VRD with both MEF & EA	136	(40%)	99	(44%)	157	(45%)	392	(43%)
VRD with neither MEF or EA	15	(4%)	12	(5%)	14	(4%)	41	(5%)
	344	(100%)	223	(100%)	346	(100%)	913	(100%)
Interest Rate								
VRD bundled only with EA	53	(39%)	64	(42%)	25	(28%)	142	(38%)
VRD bundled only with MEF	21	(16%)	16	(10%)	10	(11%)	47	(12%)
VRD with both MEF & EA	28	(21%)	41	(27%)	31	(34%)	100	(26%)
VRD with neither MEF or EA	33	(24%)	32	(21%)	24	(27%)	89	(24%)
	135	(100%)	153	(100%)	90	(100%)	378	(100%)

CHAPTER 3

DETERMINANTS OF VOLUNTARY RISK DISCLOSURE

In this section, I investigate the determinants of voluntarily risk-related disclosures outside of the annual report. I draw upon studies of voluntary disclosure and risk management to identify likely determinants of voluntary risk disclosure. I assume that a primary driver of exchange and interest rate disclosure is the materiality of the effect of these risks on earnings.

I compare my sample of *risk disclosers* to all *risk non-disclosers*. The risk non-discloser sample includes the population of all remaining non-financial, non-energy firms with available information on Compustat. I estimate the following logistic regression model, where each observation is a year in which a voluntary risk disclosure could occur.

$$VOL_RISK_DISC_i = \alpha_0 \quad (1)$$

Foreign Exchange Fluctuations:	$+\alpha_1 FRGN_SALES_i$
Interest Rate Fluctuations:	$+\alpha_2 LEV_i$
External Financing:	$+\alpha_3 EQ_OFF_i + \alpha_4 DEBT_OFF_i$
Systematic Risk:	$+\alpha_5 BETA_i$
Information Asymmetry:	$+\alpha_6 SPREAD_i$
Firm Size:	$+\alpha_7 SIZE_i$
Institutional Ownership:	$+\alpha_8 INST_OWN_i$
Litigation:	$+\alpha_9 HIGHTECH_i + \alpha_{10} LITIGATION_i$
Earnings Change Sign:	$+\alpha_{11} SIGN_EARN\Delta_i$
Year Variables:	$+\alpha_{12} YEAR2002_i + \alpha_{13} YEAR2003_i + \varepsilon_i$

My initial sample yields 884 firm-years in which a disclosure of risk-related information occurs. I exclude observations with insufficient data (which reduces the sample by 144 observations of risk disclosure and 36,523 observations with no risk disclosure), leaving a

sample of 740 observations of a risk disclosure and 10,436 observations with no risk disclosure. I estimate equation (1) where VOL_RISK_DISC equals 1 for an observation with either an interest rate disclosure or a foreign exchange disclosure in a sample year and 0 otherwise.¹⁷ Then, I estimate this model for each type of voluntary risk disclosure (i.e., interest rate risk and foreign exchange rate risk) separately.

The first two variables in the model proxy for a firm's exposure to fluctuations in foreign exchange and interest rates. The remaining variables are well-known determinants of issuing management earnings forecasts and/or relate to risk management literature. I describe each variable and its measurement in the following sections.¹⁸

3.1 Foreign Exchange Fluctuations

Firms with international operations are more likely to be affected by fluctuations in foreign currency (Barton, 2001). Therefore, I expect that these firms issue more foreign exchange risk-related disclosures. I use foreign sales (FRGN_SALES) as a proxy for foreign exchange rate risk. I measure foreign sales as foreign segment sales divided by total segment sales.

3.2 Interest Rate Fluctuations

In general, firms largely financed through debt are more likely to be affected by fluctuations in interest rates. I expect that highly levered firms issue more voluntary risk-related

¹⁷ A firm can be included twice in one year if it has both a foreign exchange and an interest rate risk disclosure. Forty-three disclosing firms are included twice in one year and 157 firms disclose in two or more years. A non-disclosing firm can be included each year it does not disclose. Given the sample size, I do not expect multiple observations for the same firm to cause substantial dependence. As a result of possible low time-series variation in firm-specific variables, I reran the logit models on a subsample of firms where all but one observation per firm is discarded. The unique observations in the subsample were selected by sorting the output from a random number generator. My conclusions are robust to this additional test.

¹⁸ I winsorize the continuous variables at the first and ninety-ninth percentiles to reduce the influence of outliers.

disclosures, specifically interest rate risk disclosures. I measure leverage as long-term debt plus any debt in current liabilities divided by total assets (Cohen, 2003).

3.3 External Financing

Equity Offerings

Frankel, McNichols, and Wilson (1995) and Lang and Lundholm (2000) find that firms that access capital markets issue more voluntary earnings disclosures during the same period. Managers have incentives to decrease information risk to lower the costs of an equity offering or to hype the stock and increase proceeds from the equity offering (Lang and Lundholm, 2000). To the extent that risk-related voluntary disclosure is indicative of voluntary disclosure, in general, I expect to find a positive association between equity offerings and risk disclosure. However, the inverse relation between risk and firm value suggests a potential alternative prediction; firms issuing equity may not want to clearly link uncontrollable market risks to the firm. Thus, I do not make a directional prediction. I measure equity offerings (EQ_OFF) as the cumulative proceeds for each year found in the Statement of Cash Flows obtained from Compustat, scaled by average total assets.

Debt Offerings

Likewise, managers have an incentive to decrease information risk to lower the cost of a debt offering. Lenders and underwriters examine a firm's disclosures when determining their default risk (Sengupta, 1998). Sengupta finds an inverse relation between a firm's disclosure policy and its interest cost of issuing debt. His argument suggests a positive association between debt offerings and risk information disclosure. However, given the potential adverse

consequences of highlighting risk pursuant to a financing activity, managers may not wish to disclose market risks (given their lack of control over such risks) before a debt offering. Therefore, I do not make a directional prediction for the association between debt offerings and voluntary risk disclosures. I measure DEBT_OFF as long-term debt issuance listed in the Statement of Cash Flows obtained from Compustat, scaled by average total assets.

3.4 Systematic Risk

Jorgensen and Kirschenheiter (2003) find that firms' betas decrease *after* voluntary risk disclosure. A cross-sectional test of this inherently time-series prediction is problematic and necessitates a non-directional hypothesis. If high beta firms disclose to reduce beta, then beta is positively associated with risk disclosure. If prior voluntary risk disclosure has already reduced beta and disclosing firms have lower betas *ex post* than non-disclosing firms, all else held equal, voluntary risk disclosers will have lower betas. I estimate beta using the market model and require a minimum of 30 out of 60 monthly returns and a market index return equal to the value-weighted NYSE/AMEX return.

3.5 Information Asymmetry

In Jorgensen and Kirschenheiter's (2003) model, firms have incentives to voluntarily issue market risk disclosures to reduce information asymmetry. DeMarzo and Duffie (1995) find that disclosing hedge positions helps reduce information asymmetry. Voluntary risk disclosure could lower information asymmetry and/or help maintain a lower level of information asymmetry (Jorgensen and Kirschenheiter, 2003). For reasons analogous to those provided for beta, I am unable to directly test the time-series hypothesis that voluntary risk disclosure reduces

information asymmetry with cross-sectional tests. Accordingly, I do not make a directional prediction for information asymmetry. Consistent with prior literature, I use the bid-ask spread to proxy for information asymmetry (e.g., Leuz and Verrecchia, 2000 and Collier and Yohn, 1997). I measure SPREAD as the average percentage bid-ask spread for the firm's fiscal year, scaled by average price.

3.6 Firm Size

Guay (1999) suggests that economies of scale drive larger firms to manage risks more actively. Prior literature has found a positive association between firm size and risk management (e.g., Allayannis and Ofek, 2001 and Geczy, Minton, and Schrand, 1997). Similarly, large firms are more likely to have accounting systems designed to produce detailed information and to more easily facilitate disclosure. Also, previous research has found a positive association between firm size and voluntary disclosure (e.g., Cox, 1985; Lang and Lundholm, 1993; Kasznik and Lev, 1995; and Cohen, 2003), perhaps because larger firms have more investors and a greater number of analysts following the firm, which creates a higher demand for disclosure. Therefore, I expect that voluntary disclosure of risk information is increasing in firm size. I measure firm size by taking the log of the market value of equity at the end of the year.

3.7 Institutional Ownership

Institutional investors with large investments in a given firm will be concerned about how external risks affect the firm, and they will likely demand increased risk disclosures. Institutional ownership is positively associated with the issuance of management earnings forecasts (Ajinkya, Bhojraj, and Sengupta, 2005). If institutional owners also demand increased

public disclosures about risk, I expect a positive association with voluntary risk disclosures in press releases. I measure institutional ownership (INST_OWN) as the average percentage of shares held by institutional investors for each sample year. I obtain this information from Thompson Financial.

3.8 Litigation Incentives

High-technology firms

Prior research suggests that high-tech firms issue more earnings forecasts to help prevent litigation (Kasznik and Lev, 1995). Firms in high-technology industries are generally associated with greater risk and may be more likely to keep market participants informed of changes in their risk. On the other hand, high-technology firms may choose not to draw attention to how external risk has affected or will affect the firm, especially since they are already viewed as high risk. I do not make a directional prediction for high-technology firms. Consistent with Baginski, Hassell, and Kimbrough (2002, 2004), I classify the following firms as HIGHTECH firms: Biotechnology (SIC codes 2833-2836), Computers (3570-3577), Electronics (3600-3674), Programming (7371-7379), and R&D (8731-8734).

Litigation

Prior research has found that firms in industries with higher litigation risk and bad earnings news are more likely to issue voluntary earnings disclosures (Skinner, 1994, 1997; Kasznik and Lev, 1995; and Baginski, Hassell, and Kimbrough, 2002). High litigation risk firms may issue voluntary risk-related disclosures to help inform market participants of ongoing risk and to help keep information asymmetry among investors low. On the other hand, given the

uncontrollable nature of interest and exchange rates, high litigation risk firms may not choose to draw attention to how risk has affected or will affect the firm. I do not make a directional prediction for the association between high litigation risk firms and voluntary risk disclosures. Consistent with Francis, Philbrick, and Schipper (1994), I classify high technology firms that experienced an earnings decrease of more than 20% during the year in the following industries as high litigation firms: Biotechnology (SIC codes 2833-2836), Computers (3570-3577), Electronics (3600-3674), Programming (7371-7379), and R&D (8731-8734).

3.9 Sign of Earnings Change

Prior research has found that firms with bad earnings news are more likely to issue management earnings forecasts (Baginski, Hassell, and Kimbrough, 2002). Firms with bad earnings news may issue voluntary risk disclosures to attribute bad earnings news to external market risks. However, firms with bad earnings news may not want to draw market participant attention to additional risks. Thus, I do not make a directional prediction. I designate the sign of earnings change ($SIGN_EARN\Delta$) as 1 if current year earnings less prior year earnings are positive and 0 otherwise.

3.10 Year Variables

The sample year variables capture macroeconomic effects of specific years. During my sample period, the U.S. dollar weakened against other foreign currencies and U.S. interest rates fell and remained at historically low levels. Rate fluctuations will likely affect voluntary risk disclosure behavior.

CHAPTER 4

RESULTS

4.1 Descriptive Statistics

Table 4.1 reports descriptive statistics for each continuous determinant. Disclosing firms are larger, with more institutional owners, lower information asymmetry, and have lower systematic risk. However, disclosing firms also have higher levels of foreign sales and leverage. Non-disclosing firms are more likely to issue equity during the sample period.

Table 4.2 presents correlation statistics. Pearson correlations are presented in the upper right corner and Spearman correlations are presented in the lower left corner. Both institutional ownership (INST_OWN) and information asymmetry (SPREAD) show a marked correlation with firm size (SIZE) (Spearman correlation coefficients of 0.6711 and -0.8137, respectively). Institutional ownership (INST_OWN) and information asymmetry (SPREAD) are also highly correlated (Spearman correlation coefficient of -0.6335), and leverage (LEV) and debt offerings (DEBT_OFF) show moderate correlation (Spearman correlation coefficient of 0.5363). HIGHTECH and LITIGATION are highly correlated (Spearman correlation coefficient of 0.6133) because LITIGATION firms are those in a high-tech industry with a greater than 20% earnings decline. HIGHTECH is also moderately correlated with BETA (Spearman correlation coefficient of 0.4031). Highly correlated variables will likely be less significant in the multiple logistic regression.

4.2 Primary Results

The results of estimating equation (1) appear in Table 4.3. Panel A reports results for all sample firms. As expected, firms with more market risk exposure are more likely to voluntarily disclose risk-related information. Foreign sales (FRGN_SALES) are associated with more voluntary risk disclosure ($p < 0.0001$ in both the simple and multiple regression specifications). Also, leverage (LEV) is positively associated with voluntary risk disclosure ($p < 0.0001$).

Firms engaged in equity (but not debt) offerings (EQ_OFF) are less likely to voluntarily disclose risk information ($p < 0.0001$ and 0.0024), consistent with the notion that firms issuing equity do not want to directly link uncontrollable market risks to their firm. BETA is negatively associated with voluntary risk disclosure ($p < 0.0001$). Thus, less risky firms are more likely to issue voluntary risk disclosures, which suggests that issuing voluntary risk disclosures helps maintain a lower beta. The simple regression results show that firms with lower levels of information asymmetry (SPREAD) are more likely to voluntarily disclose information about risk ($p < 0.0001$). Firms with lower information asymmetry can benefit from voluntary risk disclosure, which helps investors better understand risks and, in turn, can help maintain lower transaction costs and information risk. However, in the multiple regression, SPREAD becomes significantly positive. The correlation between SPREAD with SIZE helps explain this change. When I remove SIZE from the model, SPREAD is significantly negative ($p = <0.0001$, untabulated). Firm size (SIZE) and institutional ownership (INST_OWN) are positively related to voluntary risk disclosures ($p < 0.0001$), as expected if larger firms have more developed risk management policies in place that include voluntary risk disclosure and higher information demands from investors. In the simple regression, firms included in HIGHTECH are less likely to issue voluntary risk disclosures ($p < 0.0001$), suggesting that these firms do not want to draw

attention to how external risks affect the firm. However, in the multiple regression, HIGHTECH becomes insignificant ($p = 0.6900$). When I remove the correlated variables LITIGATION and BETA, HIGHTECH is significantly negative ($p < 0.0001$, untabulated). Firms with higher litigation risks (LITIGATION) are less likely to voluntarily disclose risk information ($p < 0.0001$ and 0.0007), suggesting that firms subject to litigation risk do not want to directly link uncontrollable market risks to their firm. The simple regression results show that firms with bad earnings news (SIGN_EARNΔ) are less likely to voluntarily disclose risk information ($p < 0.0001$), indicating that firms with an earnings decrease do not want to highlight external market risks. SIGN_EARNΔ becomes insignificant in the multiple regression model ($p = 0.7581$). Panel B reports logistic results for foreign exchange risk disclosing and risk non-disclosing firms, and Panel C reports logistic results for interest rate risk disclosing firms. The results are similar to those found in Panel A.¹⁹

In summary, firms with higher foreign sales and leverage are more likely to issue voluntary risk disclosures. Risk disclosing firms are larger, have significant institutional ownership, lower beta and lower levels of information asymmetry than non-disclosing firms. These firms are most likely to benefit from issuing disclosures that can meet the demands of institutional owners and help maintain a lower beta and information asymmetry. On the other hand, firms with an earnings decrease, higher risk of litigation, those in technology industries,

¹⁹ The significant determinants are significant incrementally to FRGN_SALES and LEV, which control for foreign exchange and interest rate exposure. I reran the logit model for firms with higher foreign exchange risk and for firms with higher interest rate risk. I classify firms as having higher foreign exchange risk if foreign sales are greater than the sample mean and as having higher interest rate risk if leverage is greater than the sample mean. HIGHTECH becomes significant in the multivariate model for firms with high foreign exchange fluctuation exposure, and EQ_OFF and SPREAD become insignificant in the multivariate model. DEBT_OFF becomes significantly positive in the univariate model for firms with high foreign exchange exposure and for firms with high interest rate exposure. The remaining results are consistent with the results presented in Table 4.3.

and those issuing equity are less likely to issue voluntary risk disclosures. These firms are least likely to benefit from discussing external market risks beyond management control.²⁰

²⁰ The variables in the model explain approximately 23% of the variation in voluntary risk disclosure. This is similar to other voluntary disclosure papers. For example, Wasley and Wu (2006) find that their logistic model explains approximately 28% of the variation in voluntary cash flow forecasts. I use the Cox and Snell (1989) Pseudo R^2 : $\text{Pseudo } R^2 = 1 - \exp\{2[\log L(M) - \log L(0)]/n\}$, where $\log L(M)$ and $\log L(0)$ are the maximized log likelihood for the fitted model and the “null” model containing only an intercept term, and n is the sample size. The Cox-Snell Pseudo R^2 cannot reach the maximum of one. I use the Nagelkerke (1991) rescaled Pseudo R^2 , which adjusts the Cox-Snell measure so that a maximum value of one can be achieved: $\text{Pseudo } R^2 - \text{adjusted} = \text{Pseudo } R^2 / [1 - \exp(2\log L(0)/n)]$.

TABLE 4.1
Descriptive Statistics

Disclosing Firms Compared with Non-Disclosing Firms

Continuous Variables ^a	N	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile	t-test p-value Wilcoxon p-value ^b
FRGN_SALES							
Without a VRD	10,436	0.1512	0.2693	0.0000	0.0000	0.2062	<0.0001
With a VRD	740	0.3213	0.2961	0.0000	0.3035	0.4934	<0.0001
LEV							
Without a VRD	10,436	0.2262	0.2400	0.0108	0.1718	0.3559	<0.0001
With a VRD	740	0.2943	0.2044	0.1580	0.2711	0.3968	<0.0001
EQ_OFF							
Without a VRD	10,436	0.0557	0.1644	0.0004	0.0051	0.0214	<0.0001
With a VRD	740	0.0178	0.0552	0.0005	0.0047	0.0135	0.0095
DEBT_OFF							
Without a VRD	10,436	0.0926	0.2131	0.0000	0.0000	0.0829	0.2734
With a VRD	740	0.1014	0.1848	0.0000	0.0286	0.1202	<0.0001
BETA							
Without a VRD	10,436	1.2332	1.0300	0.4808	0.9673	1.7552	<0.0001
With a VRD	740	0.8570	0.6809	0.4016	0.7288	1.1307	<0.0001
SPREAD							
Without a VRD	10,436	0.0294	0.0371	0.0060	0.0151	0.0380	<0.0001
With a VRD	740	0.0133	0.0218	0.0031	0.0061	0.0134	<0.0001
SIZE (in millions)							
Without a VRD	10,436	5,044.14	2,215.23	3,472.60	5,061.15	6,601.57	<0.0001
With a VRD	740	7,267.65	2,165.86	6,064.20	7,326.98	8,789.47	<0.0001
INST_OWN							
Without a VRD	10,436	0.3653	0.3003	0.0644	0.3331	0.6361	<0.0001
With a VRD	740	0.5880	0.2562	0.4704	0.6485	0.7810	<0.0001

^aVariables are defined as follows: FRGN_SALES is foreign segment sales divided by total segment sales; LEV is long-term debt plus short-term debt divided by total assets; EQ_OFF is the cumulative proceeds of equity issuances for each year scaled by average total assets; DEBT_OFF is the long-term debt issuance for each year scaled by average total assets; BETA is estimated using the market model with a minimum of 30 out of 60 monthly returns and a market index equal to the value weighted NYSE/AMEX return; SPREAD is the average percentage bid-ask spread for the firm's fiscal year, scaled by average price; SIZE is the log of the market value of equity at the end of the year; INST_OWN is the average percentage of shares held by institutional investors during each sample year.

^bp-values are from two-tailed tests for a difference between the two subsamples.

TABLE 4.2
Correlation Matrix

	FRGN_ SALES	LEV	EQ_ OFF	DEBT_ OFF	BETA	SPREAD	SIZE	INST_ OWN	HIGH TECH	LITIG_ ATION	SIGN_ EARNA	YEAR 2002	YEAR 2003
FRGN SALES	1.0000	-0.0617	-0.0434	-0.0557	0.1551	-0.1441	0.1986	0.1700	0.0442	0.0812	-0.0374	-0.0007	0.0577
		(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.9382)	(<0.0001)
LEV	-0.0373	1.0000	-0.1017	0.3124	-0.1488	0.1565	-0.0360	-0.0355	-0.2145	-0.1303	0.0051	0.0054	-0.0567
	(<0.0001)		(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0001)	(0.0002)	(<0.0001)	(<0.0001)	(0.5911)	(0.5660)	(<0.0001)
EQ OFF	0.0595	-0.2474	1.0000	-0.0247	0.1573	-0.0116	-0.0486	-0.0974	0.1723	0.0472	0.0360	-0.0561	0.0569
	(<0.0001)	(<0.0001)		(0.0092)	(<0.0001)	(0.2188)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
DEBT OFF	0.0014	0.5363	-0.0849	1.0000	-0.0860	0.0107	0.0083	0.0176	-0.0933	-0.0673	0.0244	-0.0329	-0.0004
	(0.8838)	(<0.0001)	(<0.0001)		(<0.0001)	(0.2586)	(0.3786)	(0.0628)	(<0.0001)	(<0.0001)	(0.0099)	(0.0005)	(0.9632)
BETA	0.1229	-0.2314	0.2385	-0.1765	1.0000	0.0043	-0.0861	-0.0833	0.4084	0.3430	-0.1267	0.0227	0.0494
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)		(0.6496)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0164)	(<0.0001)
SPREAD	-0.2308	0.0697	-0.3144	-0.0466	0.0113	1.0000	-0.6965	-0.5225	-0.0053	0.0542	-0.1206	-0.0088	-0.2057
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.2333)		(<0.0001)	(<0.0001)	(0.5748)	(<0.0001)	(<0.0001)	(0.3524)	(<0.0001)
SIZE	0.2710	0.0518	0.2506	0.1465	-0.0793	-0.8137	1.0000	0.6658	-0.0388	-0.0966	0.1491	-0.0849	0.1382
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)		(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
INST OWN	0.2197	0.0082	0.1622	0.0845	-0.0620	-0.6335	0.6711	1.0000	-0.0505	-0.0898	0.1053	0.0009	0.0893
	(<0.0001)	(0.3882)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)		(<0.0001)	(<0.0001)	(<0.0001)	(0.9231)	(<0.0001)
HIGHTECH	0.0032	-0.2739	0.2557	-0.1892	0.4031	-0.0160	-0.0442	-0.0511	1.000	0.6133	-0.0312	0.0083	0.0085
	(0.7386)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0907)	(<0.0001)	(<0.0001)		(<0.0001)	(0.0010)	(0.3819)	(0.3707)

TABLE 4.2
Correlation Matrix
(continued)

	FRGN_ SALES	LEV	EQ_ OFF	DEBT_ OFF	BETA	SPREAD	SIZE	INST_ OWN	HIGH TECH	LITIG ATION	SIGN_ EARNA	YEAR 2002	YEAR 2003
LITIGATION	0.0541	-0.1687	0.1066	-0.1288	0.3201	0.0736	-0.1011	-0.0874	0.6133	1.0000	-0.4208	0.0079	0.0108
	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)		(<0.0001)	(0.4054)	(0.2558)
SIGN_EARNA	-0.0304	0.0116	0.1015	0.0275	-0.1252	-0.1677	0.1523	0.1006	-0.0312	-0.4208	1.0000	0.0219	0.0189
	(0.0013)	(0.2207)	(<0.0001)	(0.0037)	(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)	(0.0010)	(<0.0001)		(0.0206)	(0.0461)
YEAR2002	0.0008	0.0016	-0.0359	-0.0271	0.0186	0.0286	-0.0850	0.0009	0.0083	0.0079	0.0219	1.0000	-0.4932
	(0.9318)	(0.8687)	(0.0001)	(0.0042)	(0.0496)	(0.0025)	(<0.0001)	(0.9242)	(0.3819)	(0.4054)	(0.0206)		(<0.0001)
YEAR2003	0.0580	-0.0567	0.0845	-0.0104	0.0289	-0.3068	0.1368	0.0916	0.0085	0.0108	0.0189	-0.4932	1.0000
	(<0.0001)	(<0.0001)	(<0.0001)	(0.2717)	(0.0023)	(<0.0001)	(<0.0001)	(<0.0001)	(0.3707)	(0.2558)	(0.0461)	(<0.0001)	

The table presents Pearson correlation coefficients (probabilities) in the upper right and Spearman correlation coefficients (probabilities) in the lower left corner.

Variables are defined as follows: FRGN_SALES is foreign segment sales divided by total segment sales; LEV is long-term debt plus short-term debt divided by total assets; EQ_OFF is the cumulative proceeds of equity issuances for each year scaled by average total assets; DEBT_OFF is the long-term debt issuance for each year scaled by average total assets; BETA is estimated using the market model with a minimum of 30 out of 60 monthly returns and a market index equal to the value weighted NYSE/AMEX return; SPREAD is the average percentage bid-ask spread for the firm's fiscal year, scaled by average price; SIZE is the log of the market value of equity at the end of the year; INST_OWN is the average percentage of shares held by institutional investors during each sample year; HIGHTECH firms belong to the following industries: biotechnology (2833-2836), computers (3570-3577), electronics (3600-3674), programming (7371-7379), and R&D (8731-8734); LITIGATION equals 1 if earnings have decreased more than 20% during the year and the firm belongs to one of the following industries: biotechnology (2833-2836), computers (3570-3577), electronics (3600-3674), programming (7371-7379), and R&D (8731-8734), otherwise, LITIGATION equals 0; SIGN_EARNA equals 1 if current year earnings less prior year earnings is positive and 0 otherwise; YEAR2002 equals 1 if a risk disclosing or risk non-disclosing firm is included in 2002 and 0 otherwise; YEAR2003 equals 1 if a risk disclosing or risk non-disclosing firm is included in 2003 and 0 otherwise.

TABLE 4.3
Determinants of Voluntary Risk Disclosure

Panel A: All Sample Firms

		Simple Logistic Regressions^b		Multiple Logistic Regression^a	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-5.9408	<0.0001
FRGN_SALES	+	1.6668	<0.0001	1.7696	<0.0001
LEV	+	1.0344	<0.0001	1.3613	<0.0001
EQ_OFF	?	-3.9401	<0.0001	-2.3333	0.0024
DEBT_OFF	?	0.1852	0.2736	-0.2157	0.3509
BETA	?	-0.4653	<0.0001	-0.4027	<0.0001
SPREAD	?	-27.3100	<0.0001	7.2598	0.0010
SIZE	+	0.4761	<0.0001	0.4011	<0.0001
INST_OWN	+	2.5592	<0.0001	1.0451	<0.0001
HIGHTECH	?	-0.6361	<0.0001	0.0474	0.6900
LITIGATION	?	-1.0307	<0.0001	-0.6264	0.0007
SIGN_EARNΔ	?	0.3560	<0.0001	-0.0280	0.7581
YEAR2002	?	-0.1266	0.1224	-0.0570	0.5794
YEAR2003	?	0.1191	0.1366	-0.0840	0.4128
# Disclosers		740		740	
# Non-Disclosers		10,436		10,436	
Model X ²				1,052	<0.0001
Pseudo R ²				0.0898	
Pseudo R ² - rescaled				0.2328	

TABLE 4.3
Determinants of Voluntary Risk Disclosure
(continued)

Panel B: Foreign Exchange Risk Disclosers and Risk Non-Disclosers

		Simple Logistic Regressions^b		Multiple Logistic Regression^a	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-7.3094	<0.0001
FRGN SALES	+	2.2356	<0.0001	2.5792	<0.0001
LEV	+	0.5824	0.0013	0.6705	0.0114
EQ OFF	?	-3.3483	<0.0001	-1.2842	0.1325
DEBT OFF	?	-0.1100	0.6362	-0.3657	0.2810
BETA	?	-0.5325	<0.0001	-0.5896	<0.0001
SPREAD	?	-49.1255	<0.0001	7.6608	0.0289
SIZE	+	0.6070	<0.0001	0.5292	<0.0001
INST OWN	+	2.9825	<0.0001	1.1247	<0.0001
HIGHTECH	?	-0.6111	<0.0001	0.0339	0.8202
LITIGATION	?	-1.0747	<0.0001	-0.6676	0.0046
SIGN EARNΔ	?	0.4190	<0.0001	-0.0839	0.4675
YEAR2002	?	-0.3515	0.0010	-0.2151	0.1125
YEAR2003	?	0.3448	0.0004	0.0236	0.8537
# Disclosers		470		470	
# Non-Disclosers		10,436		10,436	
Model X ²				1,039	<0.0001
Pseudo R ²				0.0908	
Pseudo R ² - rescaled				0.3037	

TABLE 4.3
Determinants of Voluntary Risk Disclosure
(continued)

Panel C: Interest Rate Risk Disclosers and Risk Non-Disclosers

		Simple Logistic Regressions^a		Multiple Logistic Regression^b	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-5.6834	<0.0001
FRGN SALES	+	0.3136	0.0080	0.2483	0.1500
LEV	+	1.6362	<0.0001	1.9024	<0.0001
EQ OFF	?	-5.4882	0.0004	-4.3824	0.0068
DEBT OFF	?	0.5689	0.0148	-0.0554	0.8518
BETA	?	-0.3496	<0.0001	-0.1712	0.0426
SPREAD	?	-11.2082	<0.0001	3.0684	0.2927
SIZE	+	0.2840	<0.0001	0.2242	<0.0001
INST OWN	+	1.8808	<0.0001	1.0905	<0.0001
HIGHTECH	?	-0.6803	<0.0001	0.0024	0.9898
LITIGATION	?	-0.9587	<0.0001	-0.5032	0.0809
SIGN EARNΔ	?	0.2466	0.0456	-0.0193	0.8895
YEAR2002	?	0.2270	0.0723	0.1242	0.4038
YEAR2003	?	-0.3189	0.0238	-0.3219	0.0539
# Disclosers		270		270	
# Non-Disclosers		10,436		10436	
Model X ²				233	<0.0001
Pseudo R ²				0.0215	
Pseudo R ² - rescaled				0.1024	

TABLE 4.3
Determinants of Voluntary Risk Disclosure
(continued)

The p -values are one-tailed when a sign expectation is provided.

^aModel:

$$\begin{aligned} VOL_RISK_DISC_i = & \alpha_0 + \alpha_1 FRGN_SALES_i + \alpha_2 LEV_i + \alpha_3 EQ_OFF_i + \alpha_4 DEBT_OFF_i \\ & + \alpha_5 BETA_i + \alpha_6 SPREAD_i + \alpha_7 SIZE_i + \alpha_8 INST_OWN_i + \alpha_9 HIGHTECH_i + \alpha_{10} LITIGATION_i \\ & + \alpha_{11} SIGN_EARN\Delta_i + \alpha_{12} YEAR2002_i + \alpha_{13} YEAR2003_i + \varepsilon_i \end{aligned}$$

^bModel: $VOL_RISK_DISC_i = \alpha_0 + \alpha_1 (\text{the single indicated independent variable})_i + \varepsilon_i$

^cVariables are defined as follows: VOL_RISK_DISC equals 1 if the firm issues a foreign exchange or an interest rate risk disclosure and 0 otherwise; FRGN_SALES is foreign segment sales divided by total segment sales; LEV is long-term debt plus short-term debt divided by total assets; EQ_OFF is the cumulative proceeds of equity issuances for each year scaled by average total assets; DEBT_OFF is the long-term debt issuance for each year scaled by average total assets; BETA is estimated using the market model with a minimum of 30 out of 60 monthly returns and a market index equal to the value weighted NYSE/AMEX return; SPREAD is the average percentage bid-ask spread for the firm's fiscal year, scaled by average price; SIZE is the log of the market value of equity at the end of the year; INST_OWN is the average percentage of shares held by institutional investors during each sample year; HIGHTECH firms belong to the following industries: biotechnology (2833-2836), computers (3570-3577), electronics (3600-3674), programming (7371-7379), and R&D (8731-8734); LITIGATION equals 1 if earnings have decreased more than 20% during the year and the firm belongs to one of the following industries: biotechnology (2833-2836), computers (3570-3577), electronics (3600-3674), programming (7371-7379), and R&D (8731-8734), otherwise, LITIGATION equals 0; SIGN_EARNΔ equals 1 if current year earnings less prior year earnings is positive and 0 otherwise; YEAR2002 equals 1 if a risk disclosing or risk non-disclosing firm is included in 2002 and 0 otherwise; YEAR2003 equals 1 if a risk disclosing or risk non-disclosing firm is included in 2003 and 0 otherwise.

CHAPTER 5

SENSITIVITY TESTS

5.1 Earnings Sensitivity to Foreign Exchange and Interest Rate Risk

The results reported in Table 4.3 document that firms with higher levels of foreign sales and leverage are more likely to issue voluntary risk disclosures. Regressing a firm's earnings on foreign exchange and interest rate risks to assess earnings sensitivity to these risks is an alternative measure for the effect these risks have on the firm. However, proxies using regression estimation to measure sensitivity over a long time period are subject to measurement error. Therefore, these measures may not be better than using actual foreign sales and leverage during the same period I examine risk disclosures.

To test the sensitivity of my results to alternative risk proxies, I replace FRGN_SALES with FX_SENS, which is the absolute value of the slope coefficient of a regression of earnings changes on foreign exchange rate changes on a firm by firm basis for up to 20 years. In a like manner, I obtain IR_SENS from regressing earnings changes on interest rate changes and use it instead of LEV in the logistic regression.²¹ I estimate the following model:

$$\begin{aligned}
 VOL_RISK_DISC_i = & \alpha_0 + \alpha_1 FX_SENS_i + \alpha_2 IR_SENS_i \\
 & + \alpha_3 EQ_OFF_i + \alpha_4 DEBT_OFF_i + \alpha_5 BETA_i + \alpha_6 SPREAD_i \\
 & + \alpha_7 SIZE_i + \alpha_8 INST_OWN_i + \alpha_9 HIGHTECH_i + \alpha_{10} LITIGATION_i \\
 & + \alpha_{11} SIGN_EARN\Delta_i + \alpha_{12} YEAR2002_i + \alpha_{13} YEAR2003_i + \varepsilon_i
 \end{aligned} \tag{2}$$

Table 5.1 reports the results of estimating equation (2). Panel A reports results for all sample firms. The simple regression results show that firms where earnings are sensitive to

²¹ I use the Federal Reserve Bank's Broad Index to measure foreign exchange rates and the prime rate for interest rates (Federal Reserve Board, 2006a, 2006b).

changes in foreign exchange (FX_SENS) and interest rates (IR_SENS) are more likely to issue voluntary risk disclosures ($p = 0.0021$ and 0.0006 , respectively). In the multiple regression, IR_SENS becomes insignificant ($p = 0.1375$). FX_SENS and IR_SENS are moderately correlated (Spearman correlation coefficient of 0.3359 , untabulated). When I remove FX_SENS from the regression, IR_SENS becomes significant ($p = 0.0852$, untabulated). The remaining results are consistent with Table 4.3, Panel A. Panel B reports logistic results for foreign exchange risk disclosing and risk non-disclosing firms. Again, FX_SENS and IR_SENS are significantly positive in the simple regression results ($p = 0.0271$ and 0.0327 , respectively). They are both insignificant in the multiple regression results ($p = 0.1094$ and 0.4548 , respectively). When I remove IR_SENS from the regression, FX_SENS becomes significant at the 0.10 level ($p = 0.1035$, untabulated). Panel C reports logistic results for interest rate risk disclosing and risk non-disclosing firms. FX_SENS and IR_SENS are both significantly positive in the simple regression results ($p = 0.0108$ and 0.0012 , respectively). FX_SENS becomes insignificant in the multiple regression results ($p = 0.1066$). Overall, the results using earnings sensitivity to foreign exchange and interest rate fluctuations support the conclusion that firms with more exposure to foreign exchange rate fluctuation and interest rate fluctuation are more likely to issue voluntary risk disclosures.

5.2 Results Using Ranked Continuous Variables

To ensure that any remaining skewness in the continuous variables is not driving the results found in Table 4.3, I rank all continuous variables and re-estimate equation (1) using the ranked variables. Table 5.2 reports the results.²² Overall, the results are similar to those found in Table 4.3 with one notable exception. DEBT_OFF becomes significantly positive in all of the

²² Ranked coefficient estimates are multiplied by 10,000 to better compare to previous results.

simple regression results. When I remove correlated LEV (Spearman correlation coefficient of 0.5363, untabulated) from the multiple regression model, DEBT_OFF becomes significantly positive ($p = 0.0033$, untabulated). This result indicates that firms issuing debt are more likely to issue voluntary risk disclosures even though firms issuing equity are less likely to issue voluntary risk disclosures. The results in Panels B and C are similar to those presented in Panel A.

TABLE 5.1
Determinants of Voluntary Risk Disclosure – Alternative Risk Measures

Panel A: All Sample Firms

		Simple Logistic Regressions^b		Multiple Logistic Regression^a	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-5.7181	<0.0001
FX_SENS	+	0.0562	0.0021	0.0358	0.0502
IR_SENS	+	0.2146	0.0006	0.0788	0.1375
EQ_OFF	?	-3.9401	<0.0001	-2.7991	0.0004
DEBT_OFF	?	0.1852	0.2736	0.1104	0.5868
BETA	?	-0.4653	<0.0001	-0.2581	<0.0001
SPREAD	?	-27.3100	<0.0001	8.9101	<0.0001
SIZE	+	0.4761	<0.0001	0.4445	<0.0001
INST_OWN	+	2.5592	<0.0001	1.0481	<0.0001
HIGHTECH	?	-0.6361	<0.0001	-0.1732	0.1331
LITIGATION	?	-1.0307	<0.0001	-0.4583	0.0118
SIGN_EARNΔ	?	0.3560	<0.0001	-0.0759	0.3940
YEAR2002	?	-0.1266	0.1224	-0.0269	0.7907
YEAR2003	?	0.1191	0.1366	-0.0429	0.6696
# Disclosers		740		740	
# Non-Disclosers		10,436		10,436	
Model X ²				850	<0.0001
Pseudo R ²				0.0732	
Pseudo R ² - rescaled				0.1898	

TABLE 5.1
Determinants of Voluntary Risk Disclosure – Alternative Risk Measures
(continued)

Panel B: Foreign Exchange Risk Disclosers and Risk Non-Disclosers

		Simple Logistic Regressions^b		Multiple Logistic Regression^a	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-6.8994	<0.0001
FX_SENS	+	0.0470	0.0271	0.0338	0.1094
IR_SENS	+	0.1527	0.0327	0.0104	0.4548
EQ_OFF	?	-3.3483	<0.0001	-1.7944	0.0361
DEBT_OFF	?	-0.1100	0.6362	-0.2805	0.3432
BETA	?	-0.5325	<0.0001	-0.3228	<0.0001
SPREAD	?	-49.1255	<0.0001	6.8216	0.0458
SIZE	+	0.6070	<0.0001	0.5546	<0.0001
INST_OWN	+	2.9825	<0.0001	1.1649	<0.0001
HIGHTECH	?	-0.6111	<0.0001	-0.1769	0.2113
LITIGATION	?	-1.0747	<0.0001	-0.4373	0.0561
SIGN_EARNΔ	?	0.4190	<0.0001	-0.1162	0.2955
YEAR2002	?	-0.3515	0.0010	-0.1814	0.1684
YEAR2003	?	0.3448	0.0004	0.0794	0.5198
# Disclosers		470		470	
# Non-Disclosers		10,436		10,436	
Model X ²				785	<0.0001
Pseudo R ²				0.0694	
Pseudo R ² - rescaled				0.2322	

TABLE 5.1
Determinants of Voluntary Risk Disclosure – Alternative Risk Measures
(continued)

Panel C: Interest Rate Risk Disclosers and Risk Non-Disclosers

		Simple Logistic Regressions^a		Multiple Logistic Regression^b	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-5.5341	<0.0001
FX_SENS	+	0.0716	0.0108	0.0415	0.1066
IR_SENS	+	0.3177	0.0012	0.1953	0.0364
EQ_OFF	?	-5.4882	0.0004	-4.9502	0.0037
DEBT_OFF	?	0.5689	0.0148	0.5133	0.0482
BETA	?	-0.3496	<0.0001	-0.1489	0.0790
SPREAD	?	-11.2082	<0.0001	6.6983	0.0160
SIZE	+	0.2840	<0.0001	0.2491	<0.0001
INST_OWN	+	1.8808	<0.0001	1.0309	0.0002
HIGHTECH	?	-0.6803	<0.0001	-0.1908	0.3063
LITIGATION	?	-0.9587	<0.0001	-0.4787	0.0943
SIGN_EARN Δ	?	0.2466	0.0456	-0.0389	0.7792
YEAR2002	?	0.2270	0.0723	0.1399	0.3473
YEAR2003	?	-0.3189	0.0238	-0.3316	0.0468
# Disclosers		270		270	
# Non-Disclosers		10,436		10436	
Model X ²				189	<0.0001
Pseudo R ²				0.0175	
Pseudo R ² - rescaled				0.0836	

TABLE 5.1
Determinants of Voluntary Risk Disclosure – Alternative Risk Measures
(continued)

The p -values are one-tailed when a sign expectation is provided.

^aModel:

$$\begin{aligned} VOL_RISK_DISC_i = & \alpha_0 + \alpha_1 FRGN_SALES_i + \alpha_2 LEV_i + \alpha_3 EQ_OFF_i + \alpha_4 DEBT_OFF_i \\ & + \alpha_5 BETA_i + \alpha_6 SPREAD_i + \alpha_7 SIZE_i + \alpha_8 INST_OWN_i + \alpha_9 HIGHTECH_i + \alpha_{10} LITIGATION_i \\ & + \alpha_{11} SIGN_EARN\Delta_i + \alpha_{12} YEAR2002_i + \alpha_{13} YEAR2003_i + \varepsilon_i \end{aligned}$$

^bModel: $VOL_RISK_DISC_i = \alpha_0 + \alpha_1 (the\ single\ indicated\ independent\ variable)_i + \varepsilon_i$

^cVariables are defined as follows: VOL_RISK_DISC equals 1 if the firm issues a foreign exchange or an interest rate risk disclosure and 0 otherwise; FRGN_SALES is foreign segment sales divided by total segment sales; LEV is long-term debt plus short-term debt divided by total assets; EQ_OFF is the cumulative proceeds of equity issuances for each year scaled by average total assets; DEBT_OFF is the long-term debt issuance for each year scaled by average total assets; BETA is estimated using the market model with a minimum of 30 out of 60 monthly returns and a market index equal to the value weighted NYSE/AMEX return; SPREAD is the average percentage bid-ask spread for the firm's fiscal year, scaled by average price; SIZE is the log of the market value of equity at the end of the year; INST_OWN is the average percentage of shares held by institutional investors during each sample year; HIGHTECH firms belong to the following industries: biotechnology (2833-2836), computers (3570-3577), electronics (3600-3674), programming (7371-7379), and R&D (8731-8734); LITIGATION equals 1 if earnings have decreased more than 20% during the year and the firm belongs to one of the following industries: biotechnology (2833-2836), computers (3570-3577), electronics (3600-3674), programming (7371-7379), and R&D (8731-8734), otherwise, LITIGATION equals 0; SIGN_EARNΔ equals 1 if current year earnings less prior year earnings is positive and 0 otherwise; YEAR2002 equals 1 if a risk disclosing or risk non-disclosing firm is included in 2002 and 0 otherwise; YEAR2003 equals 1 if a risk disclosing or risk non-disclosing firm is included in 2003 and 0 otherwise.

TABLE 5.2
Determinants of Voluntary Risk Disclosure – Ranked Continuous Variables

Panel A: All Sample Firms

		Simple Logistic Regressions^b		Multiple Logistic Regression^a	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-5.7023	<0.0001
FRGN_SALES	+	1.5800	<0.0001	1.3500	<0.0001
LEV	+	1.3100	<0.0001	1.1000	<0.0001
EQ_OFF	?	-0.2000	0.0266	-0.6000	<0.0001
DEBT_OFF	?	0.8100	<0.0001	-0.0497	0.6550
BETA	?	-1.100	<0.0001	-0.9000	<0.0001
SPREAD	?	-2.100	<0.0001	0.2800	0.2648
SIZE	+	3.4800	<0.0001	2.6000	<0.0001
INST_OWN	+	2.4100	<0.0001	0.8600	<0.0001
HIGHTECH	?	-0.6361	<0.0001	0.1885	0.1150
LITIGATION	?	-1.0307	<0.0001	-0.6197	0.0008
SIGN_EARNΔ	?	0.3560	<0.0001	0.0495	0.5870
YEAR2002	?	-0.1266	0.1224	-0.0885	0.3975
YEAR2003	?	0.1191	0.1366	-0.0725	0.5287
# Disclosers		740		740	
# Non-Disclosers		10,436		10,436	
Model X ²				1,030	<0.0001
Pseudo R ²				0.0881	
Pseudo R ² - rescaled				0.2282	

TABLE 5.2
Determinants of Voluntary Risk Disclosure – Ranked Continuous Variables
(continued)

Panel B: Foreign Exchange Risk Disclosers and Risk Non-Disclosers

		Simple Logistic Regressions^b		Multiple Logistic Regression^a	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-7.4089	<0.0001
FRGN_SALES	+	2.5400	<0.0001	2.4100	<0.0001
LEV	+	0.9500	<0.0001	0.5500	0.0124
EQ_OFF	?	0.0032	0.9810	-0.4000	0.0176
DEBT_OFF	?	0.7300	<0.0001	-0.0914	0.5269
BETA	?	-1.3000	<0.0001	-1.5000	<0.0001
SPREAD	?	-2.700	<0.0001	0.5400	0.1025
SIZE	+	4.7300	<0.0001	3.7500	<0.0001
INST_OWN	+	2.8200	<0.0001	0.8300	0.0001
HIGHTECH	?	-0.6111	<0.0001	0.2549	0.0882
LITIGATION	?	-1.0747	<0.0001	-0.6941	0.0030
SIGN_EARN Δ	?	0.4190	<0.0001	-0.0038	0.9741
YEAR2002	?	-0.3515	0.0010	-0.2305	0.0933
YEAR2003	?	0.3448	0.0004	0.0962	0.5077
# Disclosers		470		470	
# Non-Disclosers		10,436		10,436	
Model X ²				1,067	<0.0001
Pseudo R ²				0.0932	
Pseudo R ² - rescaled				0.3117	

TABLE 5.2
Determinants of Voluntary Risk Disclosure – Ranked Continuous Variables
(continued)

Panel C: Interest Rate Risk Disclosers and Risk Non-Disclosers

		Simple Logistic Regressions^a		Multiple Logistic Regression^b	
Dependent Variable: Voluntary Risk Disclosure ^c	Predicted Sign	Coefficient Estimate	p-value	Coefficient Estimate	p-value
Intercept	?	--	--	-5.8922	<0.0001
FRGN SALES	+	0.3600	0.0041	0.1300	0.1919
LEV	+	1.9700	<0.0001	1.7800	<0.0001
EQ OFF	?	-0.7000	0.0002	-0.8000	<0.0001
DEBT OFF	?	0.9400	<0.0001	0.0209	0.8999
BETA	?	-0.7000	0.0003	0.0066	0.9769
SPREAD	?	-1.2000	<0.0001	-0.0602	0.8751
SIZE	+	2.0400	<0.0001	1.4300	<0.0001
INST OWN	+	1.7700	<0.0001	1.0100	0.0002
HIGHTECH	?	-0.6803	<0.0001	0.0671	0.7263
LITIGATION	?	-0.9587	<0.0001	-0.4828	0.0934
SIGN EARNΔ	?	0.2466	0.0456	0.0491	0.7245
YEAR2002	?	0.2270	0.0723	0.1112	0.4641
YEAR2003	?	-0.3189	0.0238	-0.3526	0.0551
# Disclosers		270		270	
# Non-Disclosers		10,436		10,436	
Model X ²				246	<0.0001
Pseudo R ²				0.0228	
Pseudo R ² - rescaled				0.1085	

TABLE 5.2
Determinants of Voluntary Risk Disclosure – Ranked Continuous Variables
(continued)

The p -values are one-tailed when a sign expectation is provided.

^aModel:

$$\begin{aligned} VOL_RISK_DISC_i = & \alpha_0 + \alpha_1 FRGN_SALES_i + \alpha_2 LEV_i + \alpha_3 EQ_OFF_i + \alpha_4 DEBT_OFF_i \\ & + \alpha_5 BETA_i + \alpha_6 SPREAD_i + \alpha_7 SIZE_i + \alpha_8 INST_OWN_i + \alpha_9 HIGHTECH_i + \alpha_{10} LITIGATION_i \\ & + \alpha_{11} SIGN_EARN\Delta_i + \alpha_{12} YEAR2002_i + \alpha_{13} YEAR2003_i + \varepsilon_i \end{aligned}$$

^bModel: $VOL_RISK_DISC_i = \alpha_0 + \alpha_1 (\text{the single indicated independent variable})_i + \varepsilon_i$

^cVariables are defined as follows: VOL_RISK_DISC equals 1 if the firm issues a foreign exchange or an interest rate risk disclosure and 0 otherwise; FRGN_SALES is foreign segment sales divided by total segment sales; LEV is long-term debt plus short-term debt divided by total assets; EQ_OFF is the cumulative proceeds of equity issuances for each year scaled by average total assets; DEBT_OFF is the long-term debt issuance for each year scaled by average total assets; BETA is estimated using the market model with a minimum of 30 out of 60 monthly returns and a market index equal to the value weighted NYSE/AMEX return; SPREAD is the average percentage bid-ask spread for the firm's fiscal year, scaled by average price; SIZE is the log of the market value of equity at the end of the year; INST_OWN is the average percentage of shares held by institutional investors during each sample year; HIGHTECH firms belong to the following industries: biotechnology (2833-2836), computers (3570-3577), electronics (3600-3674), programming (7371-7379), and R&D (8731-8734); LITIGATION equals 1 if earnings have decreased more than 20% during the year and the firm belongs to one of the following industries: biotechnology (2833-2836), computers (3570-3577), electronics (3600-3674), programming (7371-7379), and R&D (8731-8734), otherwise, LITIGATION equals 0; SIGN_EARNΔ equals 1 if current year earnings less prior year earnings is positive and 0 otherwise; YEAR2002 equals 1 if a risk disclosing or risk non-disclosing firm is included in 2002 and 0 otherwise; YEAR2003 equals 1 if a risk disclosing or risk non-disclosing firm is included in 2003 and 0 otherwise.

CHAPTER 6

SUMMARY, LIMITATIONS, AND CONCLUSIONS

This paper documents the incidence and properties of voluntary risk-related disclosures and examines the determinants of voluntary risk-related disclosures. Regulators and market participants have become increasingly interested in risk-related disclosures (Linsmeier and Pearson, 1997). Recent standards such as FRR No. 48 and SFAS No. 133 mandate annual report risk disclosure. Most of the current risk literature examines mandatory risk disclosures. My study is the first to empirically examine voluntary risk-related disclosures outside of the annual report.

I find that 12% of firms voluntarily disclose foreign exchange and interest rate risk information from 2001 to 2003. Most risk disclosures are qualitative (soft talk) and help explain announced earnings. Unlike mandatory *ex ante* risk disclosures which predominantly focus on downside risk, voluntary *ex ante* risk disclosures provide both upside and downside risk information.

I find several similarities between characteristics of firms that provide voluntary earnings forecasts and voluntary risk-related disclosures. Foreign sales, leverage, firm size, and institutional ownership are positively associated with foreign exchange and interest rate risk disclosure. Also, I find that firms with lower beta are more likely to issue voluntary risk disclosures. Overall, these firms are likely to benefit from transparent disclosures that help meet the demands of investors.

I also find several differences between voluntary risk-related disclosures and voluntary earnings forecasts. Firms with an earnings decrease, firms issuing equity, high-technology firms, and firms with higher litigation risk are all more likely to issue voluntary earnings forecasts but less likely to issue voluntary risk disclosures, perhaps because they are concerned about drawing investor attention to market risks beyond management control even though risk disclosures would likely be useful to investors.

My results contribute to the literature on voluntary disclosure by providing information about the incidence and determinants of voluntary risk-related disclosures. Further, the FASB and IASB continue to work on risk disclosure requirements, and knowledge of the current voluntary risk disclosure environment should complement mandatory risk disclosure information to give standard setters an overall understanding of existing risk disclosure. Investors also benefit from understanding the properties and determinants of voluntarily risk disclosure, as risk information can be an important part of valuation.

My study has several limitations. I only examine interest rate and foreign exchange risk-related disclosures. My results might not generalize to other types of risk information. I rely on Dow Jones News Service keyword searches to obtain my sample. My keyword list may exclude words that apply to either foreign exchange or interest rate risk. Although I attempt to create an objective classification scheme, reading the articles remains subject to interpretation. Finally, because a general economic theory on the determinants of voluntary risk disclosure does not exist, I rely on past voluntary disclosure research as well as risk management research to select possible determinants of voluntary risk disclosure.

Future research can extend my study by examining the consequences of voluntary risk-related disclosures. As with other forms of voluntary disclosure, voluntary risk disclosures that

investors perceive as credible will affect stock prices, most likely through their effect on firm-specific expected earnings.

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APPENDIX A

EXAMPLES OF VOLUNTARY RISK DISCLOSURES

The following examples are actual voluntary risk disclosures included in press releases.

1. CSP Inc. provides the following foreign exchange rate risk information in its January 10, 2001 press release. The press release announces first quarter earnings for fiscal year ending August 31, 2001.

CSP Inc. (CSPI) said revenue was hurt by foreign currency exchange of \$1.5 million compared with first quarter 2000.

This is coded as quantitative, *ex post*, bad news, and bundled with an earnings announcement.

2. Harsco Corp. provides the following foreign exchange rate risk information in its July 17, 2001 press release. The press release announces second quarter earnings for fiscal year ending December 31, 2001.

The industrial services company said negative foreign exchange translation lowered pretax income by about \$1.5 million, or 2 cents a share.

This is coded as quantitative, *ex post*, bad news, and bundled with an earnings announcement.

3. Eastman Kodak Co. provides the following foreign exchange rate risk information in its September 18, 2002 press release. The press release also includes a forecast for third quarter earnings for fiscal year ending December 31, 2002.

Cost cutting and productivity improvements contributed to the expected third quarter earnings performance, while sales are expected to be up "slightly" due to benefits of the foreign exchange.

This is coded as qualitative, *ex ante*, good news, and bundled with a management earnings forecast.

4. Lakeland Industries Inc. provides the following interest rate risk information in its April 28, 2003 press release. The press release announces fourth quarter and annual earnings for fiscal year ending January 31, 2003.

Lakeland Industries Inc. (LAKE) attributed the improved annual earnings to a price increase in April 2002, lowering of interest rates and a decrease in labor overhead costs.

This is coded as qualitative, *ex post*, good news, and bundled with an earnings announcement.