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Three Essays in Empirical Finance

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Abstract

This thesis includes three essays in mutual funds, empirical finance, and asset pricing.

The first essay explores the relation between mutual fund ownership and how it affects firms' corporate social responsibility (CSR) engagements. The essay classifies mutual funds into CSR-friendly and CSR-unfriendly funds using a holdings-based, value-weighted mutual fund corporate social rating (MFCSR). The empirical results show that firms with higher CSR-friendly ownership are associated with increased future levels of CSR and the firms with higher CSR-unfriendly ownership are associated with decreased future levels of CSR. This result is robust after controlling for many observable firm characteristics and firm-specific unobservable characteristics and suggests that mutual fund shareholders' CSR beliefs are important determinants of a firm's social performance.

The second essay examines whether credit markets react to linguistic tone of accounting disclosures. The essay uses event study analyses and finds that high levels of uncertain tone in the 10-Q/K filings lead to a significant increase in credit default swap (CDS) spreads around the disclosure date. This finding is consistent with uncertainty in language, increasing perceived default risk. The magnitude of this effect monotonically decreases with maturity of CDS contracts. Moreover, this effect is robust to earnings surprises, management guidance, special firm-specific events, and alternative proxies of uncertainty. Overall, the results imply that the tone of accounting disclosures provides valuable, incremental information to the CDS markets.

The third essay studies whether the type of organizational structure in mutual funds affects the likelihood of window dressing. Using U.S. equity mutual fund data, I find that, conditional on inferior performance, team-managed funds have lower levels of window dressing and deceive significantly less than single-managed funds. The negative relation between team-managed funds and window dressing is not driven by various fund characteristics that differ between single- and team-managed funds. This relation is especially significant when other forms of fund governance mechanisms are low. Thus,

the findings support the notion that the team form of organization helps reduce the incentive to deceive.

Keywords

Mutual Funds; Corporate Social Responsibility; Window Dressing; Organizational Structure; Deception; Textual Analysis; Default Risk; Uncertainty, Tone; Accounting Disclosure

Co-Authorship Statement (by Saurin Patel and Hitesh Doshi)

In Chapter 3 (Are Credit Markets Tone Deaf? Evidence from Credit Default Swaps), the Ph.D. student co-authored with us and contributed to defining the research questions, proposed different empirical designs, collected the data, and estimated the results. The student wrote many parts of the draft version and revised them with additions from co-authors and comments from seminar and conference participants.

The co-authors defined the overall research topics and helped focus the research questions along with the Ph.D. student. The co-authors reviewed drafts, helped explain results more clearly, and provided various refinements.

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Table of Contents

List of Tables

List of Figures

List of Appendices

Chapter 1

1 Introduction

The thesis includes three essays (Chapter 2, Chapter 3, and Chapter 4) in various areas in empirical finance covering mutual funds, corporate social responsibility, and the impact of uncertainty in financial statements.

The first essay explores the impact of mutual fund ownership on the corporate social responsibility (CSR) commitments of their holding firms. The literature on the role of CSR falls either into the value maximization view (e.g., Besley and Ghatak, 2007; Edmans, 2011; Deng, Kang, and Low, 2013) or into the agency problem view (Jensen, 2001; Masulis and Reza, 2015; Bénabou and Tirole, 2010). Therefore, a CSR-friendly shareholder (one who believes in the value maximization view) would support increasing CSR spending and a CSR-unfriendly investor (one who believes in the agency view) would support decreasing CSR spending. The essay specifically investigates whether increases in CSR-friendly ownership result in increases in the CSR commitments of a firm, and subsequently, if CSR-unfriendly ownership results in decreases in the CSR commitments of a firm.

I calculate a holdings-based, value-weighted CSR score for every mutual fund in a year and identify them as CSR-friendly (CSR-unfriendly) if it belongs to the top (bottom) tercile for three consecutive years. Subsequently, I calculate the total amount of CSR-friendly and CSR-unfriendly ownership in a firm in each year. I find that increases in CSR-friendly ownership in a firm are positively associated with future increases in the CSR of the firm. Likewise, I also find that increases in CSR-unfriendly ownership are negatively associated with future changes in the CSR of the firm. Furthermore, I find that the influence of CSR-friendly or CSR-unfriendly ownership depends on the firm's current level of CSR. When a firm's CSR commitments are below average, CSR-friendly ownership has a larger positive impact on CSR and CSR-unfriendly investors have a smaller negative impact on the CSR of the firm. This pattern holds when examining their impact on the CSR strengths and CSR weaknesses of a firm separately. CSR-friendly

ownership increases the CSR strengths and reduces the CSR weaknesses of a firm. CSR-unfriendly ownership reduces the CSR strengths of a firm, but also reduces the CSR weaknesses of a firm, albeit not statistically significant at conventional levels. This shows that even CSR-unfriendly investors recognize some benefits of CSR and do not oppose implementing some CSR reforms.

Chapter 3 examines the role of linguistic tone of accounting disclosures in the pricing of Credit Default Swap (CDS) contracts. In credit markets, researchers use a variety of accounting variables such as financial ratios, earnings, management forecasts, and analyst reports to price credit securities such as CDS. Little attention is given to the impact of qualitative or "soft" information, such as linguistic tone, in these accounting disclosures on CDS spreads. The essay investigates whether 10-Q/K filings with higher proportions of uncertain words (e.g., approximate, uncertain, indefinite, possible) affect investors' beliefs about the firm's default risk as captured by CDS spreads. The uncertain word list from the dictionaries developed by Loughran and McDonald, (2011) is used to measure disclosure tone. We argue that the tone of 10-Q/K filings reflects the management's confidence in the firm's business strategy, competitive position within the industry, and future financial wellbeing. Any uncertainty expressed through the tone of these disclosures should influence investors' evaluations of the firm's future value. Therefore, we hypothesize that the higher the usage of uncertain words in these disclosures, the greater the uncertainty in investors' beliefs about the firm's value and thus, the higher the CDS spreads. We also investigate the impact of uncertain disclosure tone on the term structure of CDS spreads across maturities. Duffie and Lando, (2001) predict that firms with "noisy" accounting reports have significantly higher credit spreads at shorter maturities compared to longer maturities. Therefore, we postulate that the effect of disclosure uncertainty varies across the term structure of credit spreads, with relatively higher impact for shorter maturities.

The empirical results in Chapter 3 show a positive relation between uncertain disclosure tone and changes in CDS spreads. Firms with greater uncertainty in the tone of 10-Q/K disclosure experience a significant increase in their CDS spreads following the public disclosure. We find that one standard deviation increase in uncertain tone

increases the CDS spreads by 1.4 basis points (bps) relative to the mean change across all firms of around 0.47 bps. Our finding is robust to controlling for equity returns, market volatility, spot rate, aggregate default, and term premium. Consistent with Duffie and Lando, (2001), we also find that CDS spreads with short-term maturities have greater sensitivity to uncertain tone than long-term maturities. In fact, uncertain tone sensitivities decline monotonically with maturity. This finding suggests that disclosure tone contains useful default risk information for investors in valuation of CDS contracts, particularly with short-term maturity.

In Chapter 4, I study the effect of organizational structure of mutual funds on an important agency problem in mutual funds— "window dressing." Window dressing is a form of portfolio manipulation where some managers sell poorly performing stocks and buy stocks that performed well over the reporting period to hide their true managerial ability from investors (Lakonishok, Shleifer, Thaler, and Vishny, 1991; Agarwal, Gay, and Ling, 2014; Meier and Schaumburg, 2004). This practice is looked upon unfavourably as it affects portfolio value through unnecessary trading costs and potentially priming the portfolio for lower future returns. Prior research shows that team-managed organizations can lower the inclination to engage in deceptive behaviour (Arnott and Stiglitz, 1991; Mas and Moretti, 2009) and teams increase the cost of deception by greater peer monitoring, higher guilt aversion (Charness and Dufwenberg, 2006), and by dividing the output among several members (Acemoglu, Kremer, and Mian, 2008). In this essay, I particularly look at whether team-managed funds (mutual funds with two or more fund managers) window dress less than single-managed funds (mutual funds with only one fund manager) when they have inferior performance.

The results of Chapter 4 show that, conditional on inferior performance, team-managed funds window dress less by almost 20 basis points per quarter when compared to single-managed funds. These differences are highly significant. I also investigate the circumstances under which team-managed funds are effective in curtailing deceptive behaviour. Larger fund families tend to have more resources and better internal governance mechanisms (Khoranna, 1996). Chevalier and Ellison, (1999) also show that the career concerns and incentives differ vastly among more experienced, older managers

vs younger managers and that more experienced managers are more likely to engage in deceptive behaviour. Thus, I postulate that team-managed funds will have a greater impact in reducing window dressing among smaller fund families and also among older, more experienced managers. I find exactly this result, as team-managed funds do not differ from single-managed funds in the levels of window dressing among large fund families. However, among smaller fund families where internal governance mechanisms are weaker, team-managed funds window dress less when compared to single-managed funds. I also find that team-managed funds window dress considerably less than their single-managed counterparts among older, more experienced managers. Overall, the findings from this chapter show different situations where managerial structure is very effective in curtailing window dressing behaviour in the mutual fund industry.

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Chapter 2

2 Do Mutual Funds Affect Corporate Social Responsibility?

2.1 Introduction

Investment funds incorporating social criteria have enjoyed tremendous growth over the past two decades. The U.S. Social Investment Forum (USSIF) reports that assets managed using environmental, social, and governance (ESG) issues totalled $6.57 trillion at the start of 2014. Investment companies respond to this demand by pivoting some of their existing funds to incorporate ESG criteria and by introducing new mutual funds with ESG criteria. Despite such growth in socially responsible investments, it is unclear to what extent these funds, along with other shareholders, have the capability or interest to influence the corporate social responsibility (CSR) commitments of their holding firms and this essay investigates exactly that.[1]

The literature on the role of CSR in corporations can be broadly classified into two views. The first view argues that CSR is in line with value maximization (Besley and Ghatak, 2007; Edmans, 2011; Deng, Kang, and Low, 2013). The second view is that CSR is a manifestation of agency problems inside a firm and benefits the managers at the expense of the shareholders (Masulis and Reza, 2015; Bénabou and Tirole, 2010). Additionally, managers who are engaged in CSR can lose focus on their primary responsibility of operating the firm (Jensen, 2001). So, according to the agency view, firms should not engage in CSR, as it is not in the interest of shareholders. The views of institutional owners and shareholders on the role of CSR can fall into either the value maximization view (CSR-friendly) or the agency cost view (CSR-unfriendly). Therefore, a CSR-friendly shareholder would support increasing CSR spending and a CSR-unfriendly shareholder would support decreasing CSR spending. This essay specifically

[1] Corporate social responsibility (CSR) in this paper refers to the Environmental and Social issues and does not include the traditional Governance issues.

investigates whether increases in CSR-friendly ownership result in increases in the CSR commitments of a firm, and subsequently, if CSR-unfriendly ownership results in decreases in the CSR commitments of a firm.

The research questions above are examined using a sample of actively managed U.S. domestic equity mutual funds. I focus on actively managed mutual funds, as they can be classified as CSR-friendly and CSR-unfriendly by observing their detailed holdings data. Active mutual funds do not have to keep holding on to a stock if it has a very high or low CSR. They can add or drop a stock from their portfolio at any point in time. Even though passive indexed funds can influence CSR, they cannot add or drop a stock from their portfolio as they please. This makes it difficult to infer from their holdings if they are CSR-friendly or CSR-unfriendly. The mutual fund holding data from Morningstar are combined with firm-level CSR data from the MSCI ESG KLD database from WRDS. This enables me to calculate a Mutual Fund CSR score (MFCSR), which is the value-weighted average of the CSR ratings (total CSR strengths less total CSR concerns) of all the stocks held by the mutual fund at the end of the year.[2] Using a holdings-based measure allows for the inclusion of all mutual funds instead of focusing only on a small sample of self-declared socially responsible funds (SRI). Using this measure, I identify a mutual fund as CSR-friendly (CSR-unfriendly) if it belongs to the top (bottom) tercile for three consecutive years.[3] Subsequently, I calculate the total amount of CSR-friendly and CSR-unfriendly ownership in a firm in each year.

Using a sample of 3,803 unique firms and 21,849 firm-year observations, I find that increases in CSR-friendly ownership in a firm are positively associated with future increases in the CSR commitments of the firm. Likewise, I find that increases in CSR-unfriendly ownership are negatively associated with future changes in the CSR of the firm. I also find that the influence of CSR-friendly or CSR-unfriendly ownership depends

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[2] Borgers, Derwall, Koedijk, and Horst, (2015) and El Ghoul and Karoui, (2017) use similar measures.

[3] Classifying CSR-friendly and CSR-unfriendly funds based on top and bottom quintiles do not qualitatively change the results.

on the firm's current level of CSR. When a firm's CSR commitments are below average, CSR-friendly ownership has a larger positive impact and CSR-unfriendly investors have a smaller negative impact on the CSR of the firm. Furthermore, I find that CSR-friendly ownership increases the CSR strengths and reduces the CSR weaknesses of a firm. CSR-unfriendly ownership reduces the CSR strengths of a firm, but also reduces the CSR weaknesses of a firm, albeit not statistically significant at conventional levels. This shows that even CSR-unfriendly investors recognize some benefits of CSR and do not oppose implementing some CSR reforms.

I also show a direct mechanism through which CSR-friendly ownership and CSR-unfriendly ownership can affect the CSR of a firm. Previous research shows that under certain circumstances, CSR-contingent compensation to executives can constitute optimal contracting (e.g., Holmstrom, 1979; Feltham and Xie, 1994; Ittner, Larcker, and Rajan, 1997). I find that firms with higher CSR-friendly (unfriendly) ownership are positively (negatively) associated with having executive compensation linked to CSR-related outcomes. Other alternative explanations, such as corporate governance and managerial incentives that may explain the results, are also ruled out. Jo and Harjoto, (2012) show that corporate governance is positively associated with the CSR of a firm. I add two governance variables to the regression: board size and percentage of independent directors, which reflect the effectiveness of board governance. I find that CSR-friendly and CSR-unfriendly ownership still have an influence on CSR beyond that explained by changes in governance. Prior studies also examine the relationship between executive compensation incentives and CSR, but the results are inconclusive (Mahoney and Thorne, 2005; Berrone, Makri, and Gomez-Mejia, 2008). I add two variables related to executive compensation: the sensitivity of the CEO's wealth to changes in stock price (CEO delta) and the sensitivity of the CEO's wealth to changes in stock return volatility (CEO vega). However, the effect of CSR-friendly and CSR-unfriendly ownership on the future CSR of the firm remains the same.

The essay contributes to the growing literature on the role of investors on the corporate social responsibility of a firm. Dimson, Karakaş, and Li, (2015) use private institutional data and show how private engagements can be used to improve CSR. Dyck,

Lins, Roth, and Wagner, (2016) use international data and show that institutional ownership originating from countries with higher social norms are positively associated with a firm's CSR performance. In this essay, I make four important contributions: This is one of the first essays to classify mutual fund shareholder ownership in a firm as CSR-friendly and CSR-unfriendly. Second, I show that the changes in CSR-friendly and CSR-unfriendly ownership are important determinants of a firm's CSR and that responsible funds influence them in a positive way. Third, I show that CSR-friendly and CSR-unfriendly ownership affect the likelihood of executives' compensations being contracted on CSR. Finally, I show that the support and opposition to CSR from the shareholders are very dependent on the firm's current level of CSR and are very different for CSR strengths and CSR weaknesses.

The remainder of the essay is organized as follows: Section 2.2 provides an overview of the related literature. In Section 2.3, we describe the sample and the variables used in all the tests. Section 2.4 presents the results of the regressions between CSR-friendly mutual fund ownership and a firm's CSR commitments, and Section 2.5 concludes.

2.2 Prior Research and Hypotheses Development

2.2.1 Corporate Social Responsibility, Responsible Investing, and Firm Value

A large number of literature explores the link between responsible investing and fund performance. While some studies show a positive relationship (Barnett and Salomon, 2006), and others show a negative relationship (Hong and Kacperczyk, 2009; Borgers, Derwall, Koedijk, and Horst, 2015), the majority of studies finds no significant differences between responsible funds and conventional funds (Renneboog, Ter Horst, and Zhang, 2008). On the link between CSR and firm value, Bénabou and Tirole, (2010) summarize the literature and offer two views. The first view argues that CSR is in line with value maximization as it enables the management to take a long-term perspective (Edmans, 2011). This view also states that by implementing CSR, firms can increase product differentiation, build reputation, increase customer loyalty, and premium pricing

(Besley and Ghatak, 2007; Brekke and Nyborg, 2008). The second view is that CSR is a manifestation of agency problems inside a firm and is value-destroying (Masulis and Reza, 2015); Freidman, 1970).[4]

2.2.2 Institutional Ownership and Corporate Social Responsibility

The effect of institutional ownership on corporate governance is well-documented. Higher institutional ownership is positively associated with better governance. Examples from the literature include Agrawal and Mandelker, (1992); Del Guercio and Hawkins, (1999); Gillan and Starks, (2000); and Hartzell and Starks, (2003). This monitoring effect is achieved by two methods: voicing opinions and the threat of exit. In the first method, the investor chooses to engage with the firm by having meetings, discussions, and phone calls with the firm's executives (Goldstein, 2011, 2014) or by introducing shareholder proposals (Gillan and Starks, 2000). Dissatisfied shareholders can also use the exit option and express their opinions by selling company shares. For example, Parrino, Sias, and Starks, (2003) show that large sell-offs by institutional investors increase the probability of the CEO being replaced. The influence of the institutional investors on environmental and social issues also happens in similar ways to corporate governance; however, there is limited research in this area. Dimson, Karakaş, and Li, (2015) use data from a large, institutional investor and examine engagements related to CSR issues. They find that CSR activism increases shareholder value when the engagements are successful and does not decrease shareholder value when unsuccessful. Dyck, Lins, Roth, and Wagner, (2016) use international data and show that institutional ownership originating from countries with higher social norms are positively associated with a firm's CSR performance.

[4] Bénabou and Tirole, (2010) also specify a third view where firms use CSR as an efficient channel to express their values on behalf of the stakeholders. This view can be argued to be in line with value maximization as it can result in higher motivation among employees, lower turnover, and higher reputation.

2.2.3 Hypotheses Development

This essay contributes to the existing literature by using a panel data of firms and examining the impact of certain types of institutional ownership on the CSR performance of their holding firms. Instead of looking at the overall level of institutional ownership or mutual fund ownership, I look at both the levels and changes in CSR-friendly and CSR-unfriendly mutual fund ownership in a firm. At first glance, it seems obvious that CSR-friendly ownership will positively influence the holdings of their firms, but this need not be the case. Literature shows that socially conscious investors have longer investment horizons and are willing to accept lower financial performance (Riedl and Smeets, 2017); and that fund outflows in socially responsible funds are less sensitive to performance compared to conventional funds (Benson, Brailsford, and Humphrey, 2006; Renneboog, Ter Horst, and Zhang, 2011). Also, as consumers and investors become more socially responsible, investment firms introduce new fund types to generate subsequent capital inflows and incremental revenue. In short, investment firms can use CSR as an advertising tool to attract socially conscious investors. This leads to the first two hypotheses.

***H1a*:** CSR-friendly ownership has a positive influence on a firm's future CSR.

H1b: CSR-unfriendly ownership has a negative influence on a firm's future CSR.

The influence of CSR-friendly and CSR-unfriendly ownership on firms also depends on the firm's current level of CSR. If a firm has poor CSR compared to its peers, then it can lead to higher turnover, lower customer satisfaction, and can face a loss of reputation (Kotchen and Moon, 2012). In these scenarios, the firm is more likely to face pressure from CSR-friendly shareholders to increase CSR. CSR-unfriendly shareholders are also less likely to oppose CSR spending, as the benefits of CSR spending are more visible and CSR projects are more likely to have positive net present value. Whereas, if a firm already has good CSR, then CSR-unfriendly shareholders are more likely to oppose CSR spending, as the benefits of CSR are less visible. Di Giuli and Kostovetsky (2014) show that companies with better stakeholder relations also have higher selling, general,

and administrative expenses and that firms do not recover these expenditures through increases in sales. Krüger, (2015) finds that investors react negatively to the arrival of negative CSR news, and slightly negatively to the release of positive CSR news. This shows that there are significant costs associated with social irresponsibility, but unconditionally, investors do not appreciate the implementation of CSR policies. This leads to the next two hypotheses.

H2a: The positive effect of CSR-friendly mutual funds is higher in firms with poor CSR.

H2b: The negative effect of CSR-unfriendly mutual funds is higher in firms with good CSR.

2.3 Data, Summary Statistics, and Methodology

2.3.1 Measure of CSR, MFCSR, and Other Variables

The CSR rating of a firm is obtained from the MSCI ESG KLD STATS database (henceforth KLD). KLD's database includes more than 650 companies from 1991 and more than 3,000 companies comprised of the Russell 3000 index since 2003. Analysts from KLD use publicly available information, company filings, government data, non-governmental organization data, and media sources and single out relevant information to measure a firm's environmental, social, and governance performance (ESG). Each firm is evaluated on a set of strengths and weaknesses in each of the following dimensions: community, diversity, employee relations, environment, human rights, and product safety.[5] If a firm performs a good (bad) deed deemed by KLD, it gains one point in strengths (weaknesses). I calculate the overall CSR rating for a firm as the sum of the total number of strengths less the total number of concerns across all categories.[6]

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[5] KLD also evaluates a firm on corporate governance. As the focus of this paper is strictly on the role of mutual fund on CSR, I exclude the corporate governance measure when calculating the CSR score.

[6] The simple KLD score can have a drawback as it is not possible to compare scores across time as the number of strengths and concerns vary considerably every year. All our regressions use time fixed effects

The data on mutual funds come from Morningstar Direct and cover all actively managed U.S. domestic equity mutual funds from 1996 to 2012. The sample used includes funds that belong to the following investment objectives: aggressive growth, growth, growth and income, and equity income. The sample excludes sector, international, balanced, and index funds from the analysis. The data on firm-specific variables such as firm size, return on assets (ROA), leverage, market-to-book ratio (M/B), research and development (R&D) spending, and advertising expenses are obtained from COMPUSTAT. These control variables have been shown to be important determinants of corporate social performance (Hong, Li, and Minor, 2016; Yermack, 2009). For example, larger firms are expected to engage in more CSR spending and return on assets is also very likely correlated with CSR spending, as less profitable firms are less likely to engage in CSR (Masulis and Reza, 2015). Similarly, CSR can be viewed as a form of advertising and controlling for it is important (Campbell, 2007). Appendix 2-1 lists the definitions and measurement of all variables.

2.3.2 CSR-Friendly Ownership and CSR-Unfriendly Ownership

I identify a mutual fund as CSR-friendly or CSR-unfriendly based on its mutual fund level CSR score (MFCSR). To construct a mutual fund level CSR score, I first match the annual data from Morningstar Direct to the CSR scores of firms from KLD. Some stocks are not assigned a rating by KLD. To address this problem, I follow Cremers and Petajisto, (2009) and El Ghoul and Karoui, (2017) and require that the sum of the equity weights with a CSR rating accounts for at least 67% of the portfolio. For a more complete and reliable dataset, I exclude a fund if it holds less than 10 firms in its portfolio and has total net assets of less than $5 million (Kacperczyk, Sialm, and Zheng, 2008). The MFCSR score is calculated as the value-weighted average of the CSR ratings of all the stocks held by the mutual fund at the end of the year. I then sort all mutual

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to address this problem. I also use adjusted CSR scores similar to Deng, Kang and Low (2013) and find similar results.

funds each year according to its MFCSR score every year and classify them as CSR-friendly if they belong to the top tercile for three consecutive years.[7] Similarly, a mutual fund is classified as CSR-unfriendly if it belongs to the bottom tercile for three consecutive years.[8] Finally, each year, I compute the total percentage of CSR-friendly and CSR-unfriendly mutual fund ownership in a firm.

The final combined sample consists of 3,803 unique firms and 21,849 firm-year observations from 1996 to 2012. The book leverage of a firm is capped between 0 and 1. To remove the effect of extremely small firms, I remove a firm from the sample if it has a market capitalization of less than $5 million USD. I also winsorize all variables at 1% and 99% levels to reduce the effect of outliers. Table 2-1 presents the Fama-French 48 industry and year distributions for the whole sample.

2.4 Results

2.4.1 Descriptive Statistics

Panel A of Table 2-2 presents the summary statistics of all the firm-year observations in the sample. The average firm in a year has a CSR rating of less than zero. This shows that the average firm has more concerns than strengths across its six CSR categories. The total mutual fund ownership in a firm is 10.95%, which is sub-classified into CSR-friendly ownership of 0.77% and CSR-unfriendly ownership of 4.89%. The rest of the mutual fund ownership is unclassified. Ownership by self-declared SRI funds amounts to a very small 0.18%. The rest of the variables are firm controls and the average value of: return on assets is 2.0%; log(Sales) is 6.914; book leverage is .222; market-to-book ratio is 1.51; research and development expenses are 4% of total assets; and advertising expenses are 1.2% of total assets.

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[7] As a robustness measure, I also sort funds each year within its style (objective) category to avoid potential correlations between fund style and MFCSR.

[8] Many funds happen to have a high MFCSR score in one year and normal or low MFCSR score in another year. I look at three years of information to avoid misclassifying such funds.

2.4.2 Correlations and Cross-sectional Regressions

Panel B of Table 2-2 presents the correlation table. As hypothesized, the total mutual fund ownership and CSR-unfriendly ownership are negatively related to the CSR ratings of a firm, but the CSR-friendly ownership is positively related to the CSR ratings of a firm. The sign of correlation for the rest of the control variables is as expected: ROA, size, M/B ratio, R&D, and advertising are all positively correlated with CSR and leverage is negatively correlated with CSR. However, correlations do not control for firm-specific characteristics and therefore, I conduct numerous multivariate analyses in the next sections. Table 2-3 shows the results of a population averaged cross-sectional regression. After controlling for firm-specific characteristics, firms with higher CSR ratings are positively associated with CSR-friendly ownership and firms with lower CSR ratings are positively associated with CSR-unfriendly ownership. Total mutual fund ownership is negatively associated with the CSR rating of a firm.

2.4.3 Fixed Effect Regressions and Change Regressions

The previous cross-sectional regression results do not tell us if CSR-friendly or CSR-unfriendly ownership has any influence on its holding firms. I run the following panel data fixed effect regression:

$$\boldsymbol{CSR_{i,t+1} = \beta_0 + \beta_1 ownershiptype_t + \eta Controls_{it} + \delta_i + \gamma_t + \epsilon_{it}} \qquad (\mathbf{2.1})$$

where the dependent variable is the CSR rating in the following year and the variable of interest is the type of ownership, which can be either overall mutual fund ownership, CSR-friendly ownership, or CSR-unfriendly ownership depending on the specification. The firm fixed effect is δ_i and the year fixed effect γ_t is added to ensure that the estimates are not driven by an upward trend in the increase of CSR across all firms. The standard errors are clustered at the firm level.

Table 2-4 shows the results of the fixed effects regression. CSR-friendly ownership is positively and significantly related to a firm's future CSR and CSR-unfriendly ownership is negatively and significantly related to a firm's future CSR. The results also show how the heterogeneity of "CSR friendliness" among mutual funds

affects its holding firms' CSR. Even though the coefficients from the fixed effects regression are very significant, the CSR ratings of firms could potentially be serially correlated over time and reverse causality cannot be ruled out. I conduct first difference (change) regressions to check how changes in CSR-friendly and CSR-unfriendly ownership lead to changes in CSR ratings in the following year. Apart from running the regression for the full sample, I also split the data into two subsamples: one where the CSR rating of the firm is below the median and one where the CSR rating of the firm is above the median. The regression specification is as below.

$$\Delta CSR_{i,t+1} = \beta_0 + \beta_1 \Delta ownershiptype_t + \eta \Delta Controls_{it} + \delta_i + \epsilon_{it} \quad (2.2)$$

where the variables are the same as in equation 2.1 except that both the left-hand side and the right-hand side variables reflect the change from the previous year. In this equation, δ_i represents the industry fixed effect. Table 2-5 shows the results of the above regression specification. In all the regressions, the change in CSR-friendly ownership has a positive and significant relation with the change in a firm's future CSR, and the change in CSR-unfriendly ownership has a negative and significant relation with the change in a firm's future CSR. As expected in hypotheses 2, the coefficient on the change in CSR-friendly ownership is larger when the firm's CSR is poor (below median). Similarly, the coefficient on the change in CSR-unfriendly ownership is larger when the firm's CSR is good (above median). These results show that the influence of CSR-friendly ownership is stronger when the firm has poor CSR. Even shareholders who do not have favourable opinions of CSR do not oppose CSR very strongly when the firm's CSR is poor relative to when the firm's CSR is good.

2.4.4 Likelihood of Firm Offering CSR-Linked Compensation

One channel through which shareholder ownership can influence the CSR of a firm is by linking executive compensation to CSR improvements. Academic research shows that under certain circumstances, CSR-contingent compensation to executives can constitute optimal contracting (e.g., Holmstrom, 1979; Feltham and Xie, 1994; Ittner, Larcker, and Rajan, 1997). However, critics of CSR contracts argue that they could create perverse incentives and that CSR benchmarks are easy to manipulate and difficult to verify. So, I postulate that firms with higher CSR-friendly ownership are more likely to

have executives with CSR-contingent compensation and that firms with higher CSR-unfriendly ownership are less likely to have executives with CSR-contingent compensation.

I identify the S&P 500 companies from 2009–2013 and examine their proxy statements for each year. In going through these statements, I note whether executives were offered any compensation contingent on measures such as "safety," "pollution," "customer satisfaction," "social responsibility," etc. Specifically, to code the compensation as CSR-linked**,** I use a collection of keywords based on guidance from a sustainability consulting firm.[9] I differentiate between firms that grant a CSR-contingent compensation contract and those that do not by using a dummy variable *CSR Contract Dummy*, which takes a value of 1 if the firm's proxy statement indicates that one or more of its executive's pay is tied to achievement of CSR-related outcomes, 0 otherwise.

Table 2-6 presents the results of a population averaged-logistic regression. The overall level of mutual fund ownership is negatively related and almost statistically significant at the 10% level, to the likelihood of firms offering CSR-linked compensation. The level of CSR-unfriendly ownership negatively relates to the likelihood of CSR-linked compensation and the coefficient is statistically very significant. Ikram, Li, and Minor, (2018) also show that socially responsible firms are more likely to have CSR-linked compensation contracts. To capture this effect, I run a regression where I interact CSR-friendly ownership and CSR-unfriendly ownership with the current level of CSR rating. The interaction term of *CSR F-own X CSR Rating* is not significant, but the interaction term of *CSR UF-own X CSR Rating* is negative and significant. This shows that when CSR-unfriendly ownership is high, and the current CSR level of a firm is high, the firm is very unlikely to have executive compensation linked to CSR. CSR-friendly ownership, however, is not significantly associated with *CSR Contract Dummy* in any of the regression specifications.

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[9] The complete collection of keywords is listed in Appendix 2-2.

2.4.5 CSR Strengths and Weaknesses

In many cases, CSR-related expenditure can be interpreted to mitigate the problems and negative publicity associated with social costs. If the social costs are large, it can be advantageous for companies to anticipate social pressure and reduce conflict by investing in CSR-related activities (Heal, 2005). Many papers have shown that firms invest in CSR-related activities to mitigate harm from certain other CSR weaknesses (Kotchen and Moon, 2012; Mueller and Kraussl, 2011). For the above reasons, I test if CSR-friendly ownership and CSR-unfriendly ownership differ in their impact on CSR strengths and CSR weaknesses separately instead of combining them into a single index. Table 2-7 presents the results of the regression. For CSR strengths, the results are qualitatively similar to Table 2-5. Total mutual fund ownership and CSR-unfriendly ownership are negatively related to future CSR strengths and CSR-friendly ownership is positively related to future CSR strengths. However, both CSR-friendly ownership and CSR-unfriendly ownership reduce the future CSR weaknesses of a firm. Although not statistically significant at conventional levels, this shows that even CSR-unfriendly investors recognize some benefits of CSR and do not oppose implementing some CSR reforms.

2.4.6 Corporate Governance and Executive Incentives

Hong, Li, and Minor, (2016) and Jo and Harjoto, (2012) show that corporate governance improvements have an influence on the CSR ratings of firms. I use two variables to proxy for improvements in corporate governance: change in board size and change in percentage of independent directors.[10] The data for board size and board independence are obtained from COMPUSTAT. These variables are added to the same regression specification as equation 2.2. Table 2-8 presents the results of the regression with these additional controls. The coefficient on change in board size is not significant and the coefficients on change in percentage of independent directors is significant at the

[10] In unreported results, I also use changes in governance index (G-index) created by Gompers and Meshi (2006) from 2003–2006 and find qualitatively similar results.

10% level only in the full sample. The coefficients on CSR-friendly ownership and CSR-unfriendly ownership are very similar to Table 2-5 and influence the future changes in the CSR of a firm even after controlling for corporate governance.

Another explanation for the changes in CSR could be due to changes in CEO incentives (Hartzell and Starks, 2003; (Coles and Li, 2012). I use two variables from the Execucomp database to control for CEO's incentives: CEO delta (sensitivity of CEO's wealth to changes in stock price) and CEO vega (sensitivity of CEO's wealth to changes in stock return volatility). The changes in CEO delta and CEO vega are added as controls to equation 2.2. None of the coefficients are significantly related to the future change in CSR.

2.5 Conclusion

Responsible investments have grown tremendously over the past decade and shareholders are increasingly paying attention to the CSR commitments of the firm. As different shareholders have different views on CSR, it is important to know the extent to which shareholders influence the CSR policies of a firm.

In this essay, I study a sample of all equity domestic U.S. mutual funds and employ a novel procedure of measuring CSR-friendly and CSR-unfriendly mutual fund ownership in a firm every year. I conduct a series of tests to see if they have any influence on the future CSR of a firm. The results also show that CSR-friendly and CSR-unfriendly ownership are important determinants of a firm's CSR. Further investigation has revealed that CSR-friendly ownership is associated with future increases in CSR strengths and future decreases in CSR weaknesses of a firm. Likewise, CSR-unfriendly ownership is associated with future decreases in CSR strengths, but has no effect on the future CSR weaknesses of a firm. The study also shows a direct channel through which mutual funds can affect the CSR of a firm. Firms with higher CSR-unfriendly ownership are less likely to have executive compensation contracts linked to social performance. Overall, the results show that the CSR policies of a firm are dependent on the composition of CSR-friendly and CSR-unfriendly shareholder ownership.

References to Chapter 2

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Table 2-1: Sample Distribution by Industry and Year

Panel A. Sample Distribution by Industry

#	FF48 Industry Description	Number of Firms	%
1	Agriculture	59	0.27
2	Aircraft	174	0.80
3	Apparel	308	1.41
4	Automobiles and Trucks	359	1.64
5	Banking	479	2.19
6	Beer and Liquor	75	0.34
7	Business Services	2,597	11.89
8	Business Supplies	338	1.55
9	Candy and Soda	63	0.29
10	Chemicals	612	2.80
11	Coal	86	0.39
12	Computers	869	3.98
13	Construction	322	1.47
14	Consumer Goods	399	1.83
15	Construction Materials	413	1.89
16	Defence	60	0.27
17	Electrical Equipment	310	1.42
18	Electronic Equipment	1,467	6.71
19	Entertainment	316	1.45
20	Fabricated Products	17	0.08
21	Food Products	393	1.80
22	Healthcare	380	1.74
23	Insurance	305	1.40
24	Machinery	936	4.28
25	Measuring and Control Equipment	483	2.21
26	Medical Equipment	643	2.94
27	Mining	99	0.45
28	Other	302	1.38
29	Personal Services	308	1.41
30	Petroleum and Natural Gas	1,017	4.65
31	Pharmaceutical Products	1,347	6.17
32	Precious Metals	59	0.27
33	Printing and Publishing	217	0.99
34	Real Estate	15	0.07
35	Recreation	129	0.59
36	Restaurants, Hotels and Motels	399	1.83
37	Retail	1,469	6.72

38	Rubber and Plastic Products	108	0.49
39	Shipbuilding, Railroad Equipment	65	0.30
40	Shipping Containers	93	0.43
41	Steel Works	304	1.39
42	Telecommunication	793	3.63
43	Textiles	60	0.27
44	Tobacco	50	0.23
45	Trading	335	1.53
46	Transportation	657	3.01
47	Utilities	943	4.32
48	Wholesale	617	2.82
	Total	21,849	100

Panel B. Sample Distribution by Year

Year	Number of Firms	%
1996	300	1.37
1997	334	1.53
1998	334	1.53
1999	375	1.72
2000	336	1.54
2001	707	3.24
2002	727	3.33
2003	1397	6.39
2004	2043	9.35
2005	1830	8.38
2006	1859	8.51
2007	1840	8.42
2008	1910	8.74
2009	1940	8.88
2010	2036	9.32
2011	1945	8.90
2012	1936	8.86
Total	21,849	100

This table presents the Fama-French 48 industry and year distributions for the initial sample of 3,803 unique firms and 21,849 firm-year observations.

Table 2-2: Descriptive Statistics

Panel A	N	Mean	Median	SD	Min	Max
CSR Rating	21,849	-0.202	0.000	2.281	-9.000	18.000
MF own (%)	21,849	10.948	9.749	8.309	0.042	35.548
CSR F-own (%)	21,849	0.773	0.015	1.721	0.000	9.145
CSR UF-own (%)	21,849	4.895	2.415	5.924	0.000	25.463
SR own (%)	21,849	0.183	0.008	0.571	0.000	3.743
ROA	21,849	0.020	0.043	0.143	-0.717	0.292
Sales(Log)	21,849	6.914	6.894	1.811	0.000	13.055
Book Leverage	21,849	0.222	0.194	0.206	0.000	0.929
M/B Ratio	21,849	1.510	1.072	1.412	0.077	7.725
R&D	21,849	0.040	0.000	0.077	0.000	0.454
Advertising	21,849	0.012	0.000	0.031	0.000	0.191

Panel sample consists of 3,803 unique firms and 21,849 firm-year observations from 1996 to 2012. Firm-level data are obtained from COMPUSTAT and Center for Research in Security Prices (CRSP). This sample is matched with the MSCI ESG KLD stats database. CSR rating of a firm is defined as the #number of strengths - #number of weaknesses in the six categories: community, diversity, employee relations, environment, human rights, and product. *MF own* is the total mutual fund ownership in a firm. *CSR F-own* is the mutual fund ownership held by CSR-friendly mutual funds. *CSR UF-own* is the mutual fund ownership held by CSR-unfriendly mutual funds. *SR own* is the mutual fund ownership held by self-declared Socially Responsible Funds. ROA is Return on Assets. Size is the logarithm of the Sales. Book Leverage is the book value of debt divided by the market value of equity and is capped between 0 and 1. M/B is the market value of the firm scaled by total assets. R&D is the Research and Development expenses scaled by total assets. Advertising is the Advertising expenses scaled by total assets. A firm is removed from the sample if its market capitalization is less than $10 million.

Panel B: Correlation Table

	CSR	*MF own*	*CSR F-own*	*CSR UF-own*	*SR own*	*ROA*	*Size*	*Leverage*	*M/B*	*R&D*
CSR	1									
MF own	-0.0243	1								
CSR F-own	0.2346	.2672	1							
CSR UF-own	-0.2088	0.6497	-.2556	1						
SR own	.1005	.0548	.2135	-.1491	1					
ROA	0.0724	.1494	.0939	.0595	.0677	1				
Size	0.1772	.0392	.3385	-.2629	.2785	.3268	1			
Leverage	-0.0436	.1024	-.0316	-.1176	.0691	-.1239	.2254	1		
M/B	0.0998	.0662	.1383	-.0735	-.0387	.0847	-.2830	-.3468	1	
R&D	0.0466	-.0644	.0458	-.0771	-.0732	-.4653	-.4263	-.2040	.3868	1
Advertising	0.1067	0.0016	.0271	-0.0102	0.0107	.0815	.0698	-.0191	.1240	-.0746

Table 2-3: Cross-Sectional Regression of Mutual Fund Ownership on CSR

Dependent Variable:	CSR Score$_t$			
	1	2	3	4
MF own	-1.377***			
	(0.000)			
CSR F-own		26.285***		24.768***
		(0.000)		(0.000)
CSR UF-own			-3.794***	-3.318***
			(0.000)	(0.000)
ROA	-0.025	-0.120	0.041	0.035
	(0.920)	(0.626)	(0.869)	(0.889)
Sales(Log)	0.377***	0.283***	0.346***	0.264***
	(0.000)	(0.000)	(0.000)	(0.000)
Book Leverage	-0.366**	-0.281*	-0.391***	-0.314**
	(0.015)	(0.059)	(0.009)	(0.034)
M/B Ratio	0.167***	0.114***	0.150***	0.107***
	(0.000)	(0.000)	(0.000)	(0.000)
R&D	2.274***	1.847***	2.030***	1.627***
	(0.000)	(0.000)	(0.000)	(0.001)
Advertising	3.111***	3.473***	3.211***	3.443***
	(0.002)	(0.000)	(0.001)	(0.000)
Adjusted R-square	0.165	0.184	0.173	0.192
N	21,637	21,637	21,637	21,637

The table reports results from regressing the CSR scores of a firm on mutual fund ownership. The panel data is population-averaged before running the regression. Firm-level data are obtained from COMPUSTAT and Center for Research in Security Prices (CRSP). This sample is matched with the MSCI ESG KLD stats database. The dependent variable is the CSR score of a firm and is defined as the #number of strengths - #number of weaknesses in the six categories: community, diversity, employee relations, environment, human rights, and product. All independent variables are winsorized at the 1st and 99th percentile. *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 2-4: Does Mutual Fund Ownership Influence CSR? - Evidence from Fixed Effects Regression

Dependent Variable:	$CSR\ Score_{t+1}$			
	1	2	3	4
MF own	-1.997***			
	(0.000)			
CSR F-own		12.296***		11.032***
		(0.000)		(0.000)
CSR UF-own			-4.218***	-3.724***
			(0.000)	(0.000)
ROA	0.424**	0.451***	0.416**	0.454***
	(0.014)	(0.008)	(0.016)	(0.007)
Sales(Log)	-0.057	-0.122**	-0.085	-0.120*
	(0.360)	(0.049)	(0.169)	(0.050)
Book Leverage	0.013	0.085	0.013	0.055
	(0.945)	(0.651)	(0.946)	(0.768)
M/B Ratio	0.002	-0.021	-0.003	-0.015
	(0.923)	(0.355)	(0.891)	(0.516)
R&D	-1.117*	-0.863	-1.080*	-0.956
	(0.069)	(0.146)	(0.077)	(0.105)
Advertising	-3.287	-3.331	-3.355	-3.310
	(0.116)	(0.108)	(0.103)	(0.101)
Year Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Adjusted R-square	0.620	0.623	0.623	0.626
N	18,224	18,224	18,224	18,224

The table reports results from regressing the CSR scores of a firm on lagged mutual fund ownership with firm fixed effects and year dummies. Firm-level data are obtained from COMPUSTAT and Center for Research in Security Prices (CRSP). This sample is matched with the MSCI ESG KLD stats database. The dependent variable is the CSR score of a firm and is defined as the #number of strengths - #number of weaknesses in the six categories: community, diversity, employee relations, environment, human rights, and product. All regressions include both year fixed effects and firm fixed effects. All independent variables are lagged by one year and winsorized at the 1st and 99th percentile. Standard errors are clustered at the firm level. *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 2-5: Does Mutual Fund Ownership Influence CSR? - Evidence from Change Regressions

Dependent Variable:	ΔCSR Score$_{t+1}$		
	CSR Score Below Median	CSR Score Above Median	Full Sample
	1	2	3
Δ*CSR F-own*	3.498***	3.133***	2.805***
	(0.002)	(0.003)	(0.001)
Δ*CSR UF-own*	-1.417***	-1.688***	-0.725***
	(0.000)	(0.000)	(0.000)
Δ*ROA*	0.134	-0.230	-0.077
	(0.284)	(0.196)	(0.477)
Δ*Sales(Log)*	0.003	0.141**	0.062
	(0.957)	(0.032)	(0.181)
Δ*Book Leverage*	-0.030	0.095	0.046
	(0.864)	(0.595)	(0.713)
Δ*M/B Ratio*	0.001	-0.055***	-0.038***
	(0.956)	(0.002)	(0.004)
Δ*R&D*	-0.351	-0.665	-0.390
	(0.487)	(0.213)	(0.292)
Δ*Advertising*	-0.446	-1.941	-0.721
	(0.665)	(0.174)	(0.434)
Industry Fixed Effects	Yes	Yes	Yes
Adjusted R2	0.060	0.044	0.039
N	7,110	6,980	14,090

The table reports results from regressing the change in CSR scores of a firm on lagged changes in mutual fund ownership. Column (1) and column (2) report the results for two subsamples: one where the firm's CSR score in below median and one where the firm's CSR score is above median. Column (3) reports the results for the whole sample. The dependent variable is the change in the CSR score of a firm from year t to year t+1. All independent variables are changes from year t to year t-1 and winsorized at the 1st and 99th percentile. All regressions include time and industry fixed effects. Standard errors are clustered at the firm level. *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 2-6: Likelihood of Firms Offering CSR-Linked Compensation

Dependent Variable:	*CSR Contract Dummy*$_{t+1}$		
	1	2	3
MF own	-2.052		
	(0.105)		
CSR F-own		2.411	2.195
		(0.217)	(0.330)
CSR UF-own		-6.208*	-9.683**
		(0.066)	(0.013)
CSR F-own X CSR Rating			0.100
			(0.820)
CSR UF-own X CSR Rating			-2.052**
			(0.020)
CSR Rating	0.034***	0.029**	0.033
	(0.009)	(0.023)	(0.112)
Firm Controls	Yes	Yes	Yes
Pseudo- R2	0.065	0.066	0.067
N	1,298	1,298	1,298

The table reports results from estimating different specifications of a logistic regression with *CSR Contract Dummy*$_{t+1}$ as the dependent variable. The logistic *CSR Contract dummy* takes a value of 1 if the firm offers CSR contracts to its executives in a fiscal year, 0 otherwise. The firm control variables are the same as in Table 2-4. The last column employs a conditional logistic regression model. All independent variables are lagged by 1 year and winsorized at the 1st and 99th percentile. *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 2-7: CSR Strengths and CSR Weaknesses

Dependent Variable:	CSR Strength$_{t+1}$		CSR Weakness$_{t+1}$	
	1	2	3	4
MF own	-2.621***		-0.590**	
	(0.000)		(0.013)	
CSR F-own		9.446***		-1.798*
		(0.000)		(0.080)
CSR UF-own		-4.294***		-0.461
		(0.000)		(0.135)
ROA	-0.070	-0.050	-0.502***	-0.513***
	(0.601)	(0.702)	(0.000)	(0.000)
Sales(Log)	0.131***	0.064	0.186***	0.184***
	(0.010)	(0.187)	(0.000)	(0.000)
Book Leverage	-0.068	-0.027	-0.076	-0.077
	(0.682)	(0.867)	(0.550)	(0.545)
M/B Ratio	0.000	-0.018	-0.007	-0.008
	(0.997)	(0.376)	(0.642)	(0.600)
R&D	-0.974*	-0.801	0.178	0.187
	(0.059)	(0.110)	(0.610)	(0.588)
Advertising	-3.198*	-3.255*	-0.177	-0.211
	(0.074)	(0.059)	(0.853)	(0.825)
Year Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Adjusted R2	0.753	0.758	0.705	0.705
N	18,224	18,224	18,224	18,224

The table reports results from regressing the CSR scores of a firm on lagged mutual fund ownership with firm fixed effects. The dependent variable is the CSR strengths of a firm in the first two columns and is the CSR weakness of a firm in columns (3) and (4). All regressions include both year fixed effects and firm fixed effects. All independent variables are lagged by one year and winsorized at the 1st and 99th percentile. Standard errors are clustered at the firm level. *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 2-8: Alternative Explanations - Governance Variables

Dependent Variable:	ΔCSR Score$_{t+1}$	
	Governance	Executive Compensation
	1	2
Δ*CSR F-own*	3.574***	3.405***
	(0.004)	(0.004)
Δ*CSR UF-own*	-0.959***	-0.962***
	(0.000)	(0.000)
Δ*Board size*	0.012	
	(0.462)	
Δ*%independent directors*	0.554***	
	(0.005)	
Δ*CEO delta*		0.001
		(0.202)
Δ*CEO vega*		0.070
		(0.508)
Firm Controls	Yes	Yes
Industry Fixed Effects	Yes	Yes
Adjusted R2	0.032	0.026
N	8,551	8,193

Appendix to Chapter 2

Appendix 2-1: Variable Descriptions for Chapter 2

Variable Name	Description
Dependent Variables	
CSR Rating	CSR rating of the firm calculated from KLD data. It is defined as the #number of strengths - #number of weaknesses in the following categories: community, diversity, employee relations, environment, human rights, and product. For a more detailed description on how the strengths and weaknesses are calculated, please read the manual from Kinder, Lydenberg, and Domini's (KLD) database.
CSR Strengths	It is defined as the total number of strengths in the following categories: community, diversity, employee relations, environment, human rights, and product.
CSR Weakness	It is defined as the total number of weaknesses in the following categories: community, diversity, employee relations, environment, human rights, and product.
Variables of Interest	
Mutual Fund Ownership	Mutual fund ownership is the percentage of the firm's outstanding shares held by the mutual funds.
CSR F-Own	CSR F-Own is the percentage of the firm's outstanding shares held by the CSR-friendly mutual funds.
CSR UF-Own	CSR UF-Own is the percentage of the firm's outstanding shares held by the CSR-unfriendly mutual funds.
Control Variables	
ROA	Net income before extraordinary items divided by total book assets.

Size	Log(sales).
Leverage	Book value of debt divided by market value of equity.
M/B	Market value of equity divided by book value of assets.
R&D	Research and Development spending divided by book value of assets.
Advertising	Advertising expense divided by book value of assets.
Board Size	Number of members on the board of directors.
Board Independence	Percentage of independent members on the board of directors.
CEO delta	Sensitivity of CEO's wealth to changes in stock price.
CEO vega	Sensitivity of CEO's wealth to changes in stock return volatility.

Appendix 2-2: CSR Keywords

Keywords to Identify Executive Compensation as CSR-Linked.
Community
Compliance with ethical standards
Corporate social responsibility
Customer satisfaction
Diversity
Employee wellbeing
Energy efficiency
Environmental compliance
Environmental goals
Environmental performance
Environmental projects
Greenhouse gas emissions reductions
Health
Performance relative to a corporate social responsibility index e.g., Dow Jones Sustainability Index
Product Safety
Reduced injury rates
Safety
Sustainability

Appendix 2-3- Alternate measure of CSR F-own and CSR UF-own

Dependent Variable:	CSR Score t+1			
	1	2	3	4
MF own	-2.321***			
	(0.000)			
CSR F-own		3.129***		2.737***
		(0.000)		(0.000)
CSR UF-own			-5.120***	-4.977***
			(0.000)	(0.000)
ROA	0.081	0.068	0.110	0.120
	(0.583)	(0.643)	(0.454)	(0.412)
Sales(Log)	-0.046	-0.061	-0.039	-0.043
	(0.507)	(0.377)	(0.581)	(0.537)
Book Leverage	0.189	0.241	0.191	0.205
	(0.363)	(0.244)	(0.359)	(0.323)
M/B Ratio	-0.046	-0.066**	-0.047	-0.052*
	(0.137)	(0.034)	(0.127)	(0.091)
R&D	-0.658	-0.477	-0.643	-0.588
	(0.318)	(0.463)	(0.326)	(0.364)
Advertising	-3.397	-3.267	-3.365	-3.313
	(0.126)	(0.147)	(0.130)	(0.137)
Year Fixed Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Adjusted R2	0.630	0.629	0.632	0.633
N	19,162	19,162	19,162	19,162

The table reports the results from regressing the CSR scores of a firm on alternate measures of lagged mutual fund ownership with firm fixed effects and year dummies. Firm-level data are obtained from COMPUSTAT and Center for Research in Security Prices (CRSP). This sample is matched with the MSCI ESG KLD stats database. The dependent variable is the CSR score of a firm and is defined as the #number of strengths - #number of weaknesses in the six categories: community, diversity, employee relations, environment, human rights, and product. All regressions include both year fixed effects and firm fixed effects. All independent variables are lagged by one year and winsorized at the 1st and 99th percentile. Standard errors are clustered at the firm level. *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

Chapter 3

3 Are Credit Markets Tone Deaf? Evidence from Credit Default Swaps

3.1 Introduction

Accounting information plays a very important role in the pricing of financial securities. In credit markets, researchers use a variety of accounting variables such as financial ratios, earnings, management forecast news and analyst reports to price credit securities such as Credit Default Swaps (CDS).[11] However, most of these studies focus either on the quantitative information in accounting disclosures or on the events surrounding accounting disclosures. Surprisingly, little attention is given to the impact of qualitative or "soft" information, such as linguistic tone, in these accounting disclosures on CDS spreads. This is puzzling given that there is strong evidence to suggest that the tone of accounting disclosure contains incremental, value-relevant information beyond quantitative accounting measures; and internal and external stakeholders pay a lot of attention to the tone of accounting disclosures.[12]

In this essay, we examine the role of linguistic tone of accounting disclosures in the pricing of CDS contracts. Specifically, we investigate whether 10-Q/K filings with higher proportions of uncertain words (e.g., approximate, uncertain, indefinite, possible)

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[11] See e.g., Altman, (1968); Ohlson, (1980); Duffie and Lando, (2001); Callen, Livnat, and Segal, (2009); Das, Hanouna, and Sarin, (2009); Shivakumar, Urcan, Vasvari, and Zhang, (2011); Correia, Richardson, and Tuna, (2012); Griffin, (2014); Tang, Tian, and Yan, (2015); Batta, Qiu, and Yu, (2016); Bhat, Callen, and Segal, (2016), among others.

[12] See e.g., Feldman, Govindaraj, Livnat, and Segal, (2010); Henry, (2008); Li, (2008); Loughran and McDonald, (2011), and Jegadeesh and Wu, (2013), among others. Several studies show how disclosure tone influences stakeholder behaviour. For example, equity investors react to disclosure tone (e.g., Demers and Vega, 2011; Davis, Piger, and Sedor, 2012; Loughran and McDonald, 2013); shareholders react to "overly optimistic" disclosure tone by suing firms/managers (Rogers, Van Buskirk, and Zechman, 2011); competitors change their real investment decisions based on the tone of the firms' disclosure (Durnev and Mangen, 2011); analysts respond to change in disclosure tone (e.g., Allee and Deangelis, 2014); and lastly, managers who try to strategically "manage" the tone of their disclosure (e.g., Li, 2008; Huang, Teoh, and Zhang, 2014).

affect investors' beliefs about the firm's default risk as captured by CDS spreads. To measure disclosure tone, we use the uncertain word list from the dictionaries developed by Loughran and McDonald, (2011). We argue that the tone of 10-Q/K filings reflects the management's confidence in the firm's business strategy, competitive position within the industry, and future financial wellbeing. Any uncertainty expressed through the tone of these disclosures should influence investors' evaluations of the firm's future value. Therefore, we hypothesize that the higher the usage of uncertain words in these disclosures, the greater the uncertainty in investors' beliefs about the firm's value and thus, the higher the CDS spreads.

To test our hypothesis, we use daily CDS pricing data from WRDS-Markit over the period of 2001 to 2016 for the U.S. firms. The CDS market provides an ideal laboratory setting to test our hypothesis for the following reasons. First, CDS spreads provide a direct measure of the market price of a firm's default risk, which clearly reflects what investors think about a firm's likelihood of default. In comparison, corporate bond spreads are sensitive to the choice of benchmark, risk-free rates, and may capture other factors that are not related to default risk such as liquidity, taxes, and other frictions.[13] Second, CDS markets are informationally more efficient at capturing default risk compared to bond markets. In fact, several studies show that CDS markets quickly incorporate information related to a firm's default risk and lead bond markets in credit-risk price discovery.[14] Lastly, CDS contracts are standardized, highly liquid, and available at a daily frequency. They reflect cross-sectional and time-series credit quality information and allow academic researchers to perform clean and robust empirical tests.

We begin by examining the impact of uncertain tone on changes in CDS spreads. Specifically, we focus on the changes in CDS spreads during the 11-day (-5, +5) event

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[13] For example, Elton, Gruber, Agrawal, and Mann, (2001), Longstaff, Mithal, and Neis, (2005), and Chen, Lesmond, and Wei, (2007) show that a large proportion of bonds spreads are determined by liquidity factors, which do not necessarily reflect the default risk of the issuing firm.

[14] See Augustin, Subrahmanyam, Tang, and Wang, (2014).

window centered at the 10-Q/K filing date event.[15] Changes in CDS spreads and the use of event study analyses provide direct evidence on whether uncertain disclosure tone contains relevant information about a firm's future likelihood of default. We also understand that disclosure tone cannot be the sole determinant of a firm's default risk, therefore, our analysis controls for several well-documented, firm-specific, as well as market factors, explain changes in CDS spreads such as stock return, credit ratings, and market volatility, among others.

We find a positive relation between uncertain disclosure tone and changes in CDS spreads. Firms with greater uncertainty in the tone of 10-Q/K disclosure experience a significant increase in their CDS spreads following the public disclosure. This effect is economically and statistically significant. We find that one standard deviation increase in uncertain tone increases the CDS spreads by 1.4 basis points (bps) relative to the mean change across all firms of around 0.47 bps. Our finding is robust to controlling for equity returns, market volatility, spot rate, aggregate default, and term premium.

We then investigate the impact of uncertain disclosure tone on the term structure of CDS spreads across maturities. Duffie and Lando, (2001) predict that firms with "noisy" accounting reports have significantly higher credit spreads at shorter maturities compared to longer maturities. Therefore, the effect of disclosure uncertainty varies across the term structure of credit spreads, with relatively higher impact for shorter maturities. Consistent with this prediction, we find that CDS spreads with short-term maturities have greater sensitivity to uncertain tone than long-term maturities. In fact, uncertain tone sensitivities decline monotonically with maturity. This finding suggests that disclosure tone contains useful default risk information for investors in valuation of CDS contracts, particularly with short-term maturity.

We rule out several alternative explanations for our results. First, we consider earnings surprise and firm-specific, "special" events including management guidance.

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[15] Following Callen, Livnat, and Segal, (2009), we focus on the exact filing date of the financial statements to minimize the possibility that CDS spreads may incorporate other information.

Callen, Livnat, and Segal, (2009) argue that earnings convey information about default risk and show that changes in CDS spreads inversely relate to earnings surprises. As 10-Q/K forms contain earnings information, it is plausible that the movement we observe in CDS spreads might be due to "new" earnings information and not due to the tone of the disclosure. To address this concern, we include earnings surprise in our baseline specification and find that uncertain tone contains incremental information about default risk that is not captured by earnings surprise. Besides earnings, public companies have to report certain material corporate events such as bankruptcy, financial misstatements, or other corporate major events in form 8-K. It is possible that such material events occur during our event window and convey additional default information, which results in changes in CDS spreads (e.g., Shivakumar, Urcan, Vasvari, and Zhang, 2011). To alleviate this possibility, we rerun our baseline specification by excluding event windows that coincide with special firm events reported in the form 8-K as well as management guidance. We find that excluding such events has no impact on our conclusions. Second, we consider readability of 10-Q/K filings. Li (2008), Lehavy, Li, and Merkley, (2011) and Loughran and McDonald, (2014) show that firms with less readable and more complex disclosures are associated with higher search costs and hence, greater riskiness. One might argue that the observed increase in the default risk of firms in our study might be due to the readability/complexity of such filings and not due to the tone of such disclosures. To test this explanation, we control for readability measures in our baseline regression and find that our results remain unchanged. Lastly, we consider alternative word lists. Loughran and McDonald, (2013) argue that negative and weak modal word lists might also capture the underlying ambiguity as the uncertain words. Similarly, the difference between negative and positive tone in the 10-Q/K filings can proxy uncertainty. To address these concerns, we re-estimate our baseline regression with these alternative proxies of uncertainty and find that the effect of uncertain tone on CDS spreads remains intact.

Our essay contributes to the literature in the following way. First, we highlight the importance of linguistic tone in the pricing of CDS contracts in credit markets alongside "quantitative" information from accounting disclosures. These findings add to the existing accounting literature that has mainly focused on the quantitative aspects of

accounting disclosures in the pricing of CDS contracts such as earnings, accrual, and cash flow information (e.g., Callen, Livnat, and Segal, 2009; Batta, Qiu, and Yu, 2016); management guidance (Shivakumar, Urcan, Vasvari, and Zhang, 2011); financial statement comparability (Kim, Kraft, and Ryan, 2013); and financial asset reliability (Arora, Richardson, and Tuna, 2014) among others.[16] Second, our results add to the growing literature in accounting and finance that examines the impact of textual analysis on valuation of financial assets. Researchers have documented the usefulness of textual analysis in generating value-relevant information to investors. For example, studies have analyzed the tone, content, and sentiment in newspaper articles (e.g., Tetlock, 2007) corporate disclosures (e.g., Li, 2008; Loughran and McDonald, 2011) press releases (e.g., Engelberg, 2008) as well as investor message boards (e.g., Antweiler, Werner, and Frank, 2004) and their impact on equity valuations. To our knowledge, this is the first study to apply linguistic tone analysis to credit derivative pricing and show that disclosure tone of the accounting reports provides valuable information to investors in credit markets.

The rest of the essay is as follows. The next section discusses related research and outlines our main predictions. Section 3-3 describes the sample CDS and accounting tone data and highlights our research design. Section 3-4 reports the main empirical tests related to disclosure tone and CDS spreads. Section 3-5 considers several alternative explanations for our results. Section 3-6 presents robustness checks. Section 3-7 concludes.

3.2 Prior Research and Hypotheses Development

Several prior studies highlight the importance of accounting information in prediction of corporate defaults and valuation of credit market securities. For example, Altman, (1968) and Ohlson, (1980) use accounting information such as financial ratios to predict corporate bankruptcy. Duffie and Lando, (2001) show theoretically that noisy accounting reports create uncertainty about a firm's future value in the investors' minds,

[16] See Griffin, (2014) and Augustin, Subrahmanyam, Tang, and Wang, (2014) for a comprehensive review of accounting and finance research on CDS.

which affects the term structure of credit spreads. Researchers also use hybrid models of accounting- and market-based information in pricing financial distress through CDS contracts (e.g., Das, Hanouna, and Sarin, 2009; Correia, Richardson, and Tuna, 2012). Recent studies examine CDS spreads and their relationship with earning announcements (Callen, Livnat, and Segal, 2009); cash flow news in management forecasts (Shivakumar, Urcan, Vasvari, and Zhang, 2011); the quality of internal control and cost of debt (Tang, Tian, and Yan, 2015); the adoption of International Financial Reporting Standards (Bhat, Callen, and Segal, 2016); risk factor disclosures in accounting reports (Chiu, Guan, and Kim, 2017) among others.

However, most of these studies use quantitative information in the accounting reports while giving little attention to the qualitative information in these reports. This is surprising because qualitative information, such as linguistic tone and writing style (or readability) of the accounting reports, conveys managers' views about a firm's future performance over and above the numbers in the financial statements. It also gives insight into the nature and magnitude of risks a firm faces in the future, which might have significant implications on the future firm value. Several studies exploit the usefulness of linguistic tone and/or readability of accounting disclosures in firm valuation.[17] For example, studies show that stock returns react strongly to change in tone of a firm's 10-Q/K filings (Feldman, Govindraj, Livnat, and Segal, 2010; Li, 2010; Loughran and McDonald, 2011; Jegadeesh and Wu, 2013) and readability of annual reports (Li, 2008). Studies also show that the tone of 10-Q/K disclosures also affects return volatility and analyst forecasts (Kothari, Li, and Short, 2009); future earnings (Davis and Tama-Sweet, 2012); and competitors' behaviour (Li, Lundholm, and Minnis, 2013). In fact, linguistic tone is so important to managers that they try to "strategically" manage the disclosure tone to obfuscate unfavourable information and mislead investors (Huang, Toeh and Zhang, 2014).

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[17] Researchers also examine whether linguistic tone of press releases and conference calls affects a firm's expected future value (e.g., Henry, 2008; Doran, Peterson, and Price, 2010; Price, Doran, Peterson, and Bliss, 2012; Huang, Teoh, and Zhang, 2014; Allee and Deangleis, 2015). For a comprehensive survey of literature, please refer to Kearney and Liu, (2014) and Loughran and McDonald, (2016).

Now, if linguistic tone is informative to equity investors in assessing firm risk, then should it not be valuable to creditor market participants as well? The answer to this question depends on whether linguistic tone conveys relevant information regarding a firm's future asset value. Traditional structural credit risk models, such as Merton, (1974), argue that if investors can perfectly observe a firm's asset value and if a firm's future asset value is stochastic, then accounting information (quantitative or qualitative) has no role in pricing of credit risk. However, in practice, investors in credit markets do not observe a firm's assets perfectly. Because of this imperfect information environment, as Duffie and Lando, (2001) argue, investors infer a firm's true financial condition from noisy accounting reports. Therefore, noisier accounting reports can lead to inaccurate assessments of a firm's default probabilities that, in turn, increase credit spreads.

In our setting, we measure the noise in accounting reports by the use of uncertain words (e.g., *approximate, uncertain, indefinite, possible*) in 10-Q/K filings that intuitively capture the standard deviation of noise around the true firm value. Loughran and McDonald, (2013) find that firms with a higher proportion of uncertain words in their corporate disclosures face higher valuation uncertainty. We posit that firms that use a high frequency of uncertain words in their quarterly 10-Q/K filings create valuation uncertainty in investors' minds, which results in higher credit spreads. Formally put, our first hypothesis is the following:

H1: *Firms with higher uncertain disclosure tone have higher changes in CDS spreads around the disclosure event*.

Furthermore, Duffie and Lando, (2001) also show that the shorter maturity credit spreads are significantly more sensitive to uncertainty in accounting reports than longer maturity credit spreads regardless of the riskiness of the firm. In other words, uncertainty affects the term structure of credit spreads. This arises when investors are more concerned about perceived default risk in the near future due to increased uncertainty than the perceived risk in the distant future. This leads us to our second hypothesis:

H2: *The impact of uncertain disclosure tone is larger for relatively shorter maturity CDS contracts around the disclosure event, ceteris paribus*.

Lastly, Duffie and Lando, (2001) also suggest that the effect of uncertainty regarding the firm's true value on credit spreads is larger for firms with lower initial asset value (i.e., firms with higher initial default probabilities). To proxy for a firm's initial probability of default, we use a firm's credit ratings. We divide firms into two groups based on credit ratings. Firms with a credit rating BBB and below are classified as speculative grade, while firms with a credit rating higher than BBB are classified as investment grade. We posit that the credit spreads of speculative grade firms (which are more likely to default) should be more sensitive to uncertainty compared to investment grade firms. Therefore, we expect the impact of uncertain disclosure tone to be larger for firms with a relatively poor credit rating.

H3: *The impact of uncertain disclosure tone is larger for firms with a relatively poor credit rating around the disclosure event.*

3.3 Data and Sample Selection

We test our hypotheses using the term structure of CDS spreads for U.S. firms. We obtain CDS data from Markit Group on WRDS over the period of 2001–2016. Markit is widely regarded as the leading provider of independent mark-to-market CDS data in the industry. It comprises of composite, end-of-day CDS spreads for firms with highly liquid contracts. We collect the daily data for all single name CDS contracts with one-, three-, five-, seven-, and 10-year maturity. To maintain uniformity in contracts, we only keep the CDS spreads for senior, unsecured debt with a modified restricting (MR) clause and denominated in US dollars. We primarily focus on the spreads of five-year CDS contracts, as they are the most liquid and have the best coverage in the database. We also use one-, three-, seven-, and 10-year CDS contracts to test our prediction related to the term structure of credit spreads.

The disclosure tone data are from the WRDS SEC analytics suite Readability and Sentiment Analysis database. The database reports the lexical features of the language used in accounting disclosures including financial report readability, linguistic

complexity, and uncertainty/weak modal words for each firm. We focus on the uncertainty word list (Fin-Unc) of Loughran and McDonald, (2011).[18] This list includes 285 words, such as *approximate*, *uncertain*, *depends*, *unpredictable*, and *indefinite*, that denote uncertainty through emphasis on imprecision rather than risk, particularly in business/financial context. To measure uncertain tone, we count the number of words that appear in the Loughran-McDonald Financial-Uncertainty words list and divide it by the total number of words in each firm's 10-Q/K disclosure every quarter. Other readability measures such as Flesch-Kincaid index, Fog index, Coleman-Liau index, and Harvard general inquirer negative index are also from the WRDS SEC analytics suite. We match the daily CDS data with the disclosure tone data on the SEC filing date by linking *permco, gvkey,* and *cik* unique identifiers. Our initial match contains 809 firms and 29,688 firm-quarter observations.

In addition to the CDS and tone data, we require the following firm-specific and economy-wide data to create control variables: Firm-specific control variables such as *size*, *return of assets,* and *M/B ratio* are from COMPUSTAT. We use *gvkey* to merge the COMPUSTAT data to the CDS and tone data. To calculate the *event period equity return* (EPER) and *realized volatility* (Rvol), we obtain data on equity prices, daily stock return, and the number of shares outstanding for each firm from CRSP. The firm-level credit rating data is the S&P long-term entity credit rating from COMPUSTAT. Economy-wide control variables include the following: Risk-free rate (Rf) is the three-month treasury-bill yield, Term Spread (TS) is the difference between the yields of a 10-year and one-year government bond, and the Default Spread (DS) is the difference between the yield of Moody's Baa corporate bond and the yield of the 10-year constant maturity treasury bond. Data for all these variables are from the Federal Reserve Economic Data (FRED) database of the Federal Reserve Bank of St. Louis. We also control for aggregate investors' risk appetites or market uncertainty by using a measure of implied volatility

[18] The complete word list is available at http://www.nd.edu/~mcdonald/Word_Lists.html.

from S&P 500 index option prices with 30-day maturity, better known as VIX. The VIX data are from the Chicago Board Options Exchange (CBOE) website.

Overall, after matching the control variables to the CDS data and disclosure tone data using *gvkey* and *cusip* identifiers, our final sample has 27,655 firm-quarter observations and 798 firms.

3.3.1 Research Design

We use the short-window event study design to examine the impact of disclosure tone on the changes in CDS spreads. This design provides more direct evidence concerning the economic impact of the event on the dependent variable as the firm is its own control and mitigates heteroscedasticity concerns (Callen, Livnat, and Segal, 2009). Our baseline regression specification is the following:

$$\Delta CDS\ Spread = \beta_0 + \beta_1 UNCTONE + \beta_2 \Delta Size + \beta_3 \Delta M/B + \beta_4 \Delta ROA + \beta_5 EPER + \beta_6 Rvol + \beta_7 \Delta VIX + \beta_8 \Delta Rf + \beta_9 \Delta TS + \beta_{10} \Delta DS + FEs + \varepsilon \quad (3.1)$$

where the dependent variable, *ΔCDS Spread*, is the change in CDS spreads over an 11-day window [-5, +5] centered on the 10-Q/K disclosure date in excess of the median spread change for the CDS contracts with the same credit rating as the disclosing firm. Focusing on the spread changes in excess of the credit rating helps us immune our analysis to any systematic shocks within the credit rating category. The variable of interest in the regression is UNCTONE, which is the uncertain tone of the 10-Q/K disclosure. We measure UNCTONE by the percentage of uncertain words in each firm's 10-Q/K disclosure every quarter (Loughran and McDonald, 2011).

Following prior literature, we control for several firm-specific as well as economy-wide variables that are associated with changes in CDS spreads. Firm-specific controls include changes in firm size (ΔSize); return on assets (ΔROA); and market-to-book (ΔM/B). The changes in these firm-specific controls are relative to the value in the previous quarter. We also control for cumulative daily equity returns (EPER) of the firm

during the [-5, +5] period and the realized volatility of the firm's daily equity return over the event day [-252, -6] relative to the disclosure date. Using equity return and realized volatility help sharpen our interpretation of UNCTONE by isolating the "pure" credit risk-related information effect in the regression. We also include changes in market-wide variables during the [-5, +5] period as controls: risk-free rate (*ΔRf*); Implied Volatility of S&P 500 Index options (*ΔVIX*); Term Spread (*ΔTS*); and Default Spread (*ΔDS*). Our regression model includes an interaction of time and industry fixed effects. We cluster the standard errors at the firm level. The Appendix reports the definitions of all variables used in the baseline regression.

3.3.2 Summary Statistics

Table 3-1 presents the descriptive statistics for all the variables. The firms covered in our sample are large firms with a mean (median) market value of $20.7 ($7.7) billion. The firm size is highly skewed, with the average firm being three times as large as the median firm. Given the skewness of the size distribution, we use the natural logarithm of the firm size in all our empirical specifications and hence, log changes to measure changes in the firm size.

The other firm-specific controls in our specifications include measure of profitability captured using the return on assets (ROA), market-to-book ratio (M/B), event period equity return (EPER), and realized volatility (RVOL). The mean quarterly ROA in our sample is 1.02%. There is a large variation in ROA of firms in our sample with a 25^{th} percentile value of 0.35% and a 75^{th} percentile value of 1.95%. The mean (median) M/B ratio is 0.93 (.781). EPER, defined as the cumulative daily returns of the firm during the event period, has a mean (median) of 100.3 basis points (100.2). RVOL, defined as the annualized realized volatility of the firm's daily equity returns over the past year has a mean (median) value of 0.345 (0.287).

The mean (median) CDS spread on the SEC filing day is 197 (87) basis points. Our main dependent variable is the change in CDS spreads around the disclosure event. The mean change in CDS spreads in our sample is around one basis point. Change in

CDS spreads varies significantly in our sample with the 25th and 75th percentile values of -3 and 3 basis points, respectively.

Our main independent variable of interest is disclosure uncertainty tone (UNCTONE). The mean value of the disclosure uncertainty tone is 1.38%. The 25th and 75th percentile values for UNCTONE are 1.14% and 1.59%, respectively. The summary statistics for our UNCTONE suggest that it is not highly skewed and does not suffer from the presence of outliers.

The volatility index (VIX) of S&P 500 options has a mean (median) of 20.02 (17.58). The mean (median) three-month risk-free rate (Rf) is 1.42 (0.31) per cent. Term spread (TS), defined as the 10-year U.S. treasury bond rate minus the risk-free rate, has a mean (median) of 2.05 (2.23) per cent. Default spread (DS), defined as Moody's Baa Corporate bond rate relative to the 10-year treasury bond rate, has a mean (median) of 2.67 (2.66) per cent.

3.4 Empirical Results

3.4.1 Main Result

We begin our analysis by testing our first hypothesis. We examine the relationship between the tone uncertainty and the change in five-year CDS spreads around the disclosure event date. To do so, we estimate the panel regression in equation (3.1). The dependent variable, *ΔCDS Spread,* is the change in CDS spreads over an 11-day window [-5, +5] centered on the 10-Q/K disclosure date *in excess* of the median spread change for the CDS contracts with the same credit rating as the disclosing firm.

We present the results of the panel regression in Table 3-2. The change in firm-specific variables are relative to the previous quarter. The market-level change variables reflect the change in market condition around the disclosure event date. In all our specifications, we include industry-quarter fixed effects and the clustered standard errors at the firm level. The specification in column (A) presents the results for the univariate regression. The coefficient on the measure of uncertain tone (UNCTONE) is positive and

statistically significant, which indicates that the CDS spreads of firms with uncertain disclosure tone increases around the disclosure event.

The specification in column (B) includes all firm level controls. The coefficient on the uncertain tone measure is greater in magnitude compared to column (A) and continues to be positive and significant. Examining the firm level controls, CDS spreads increase around the disclosure event date for firms that have recently experienced a decline in firm size. We also find that the CDS spreads increase for firms that have experienced an increase in market-to-book ratio. The coefficient on the event period cumulative return (EPER) indicates that firms with lower cumulative daily returns have a larger change in CDS spreads. These results are consistent with the intuition that lower equity returns, drop in firm equity, and market-to-book ratio increase default risk as reflected by an increase in CDS spreads.

The specification in column (C) includes all market level controls along with firm-specific controls. The market level controls do not affect the magnitude or significance of the uncertain tone measure but result in some improvement in the R^2. The uncertain tone measure continues to be positive and statistically significant. The magnitude and significance of the firm controls also continue to be similar to the specification in column (B). Interestingly, we fail to detect any relationship between the change in VIX and the change in CDS spreads. However, the coefficient on the change in default spread is positive and significant, suggesting that firm CDS spreads increase with the increase in aggregate default risk.

Overall, the results in columns (A) to (C) confirm our first hypothesis that firms with relatively higher uncertain disclosure tone have a higher change in five-year CDS spreads. This result is also economically significant: the coefficient in column (2) indicates that an increase in uncertain disclosure tone from the 25^{th} to 75^{th} percentile (an increase of 0.45%) is associated with a 1.84 basis points higher change in CDS spreads around the event window.

3.4.2 Term Structure of CDS Spreads

Consistent with Duffie and Lando, (2001), our second hypothesis argues that the uncertainty in accounting reports about a firm's assets affects the credit spreads of short-term maturity contracts more than long-term maturity contracts. We examine this hypothesis using information from the term structure of CDS spreads. We use changes in one-, three-, seven-, and 10-year CDS spreads to estimate equation 3.1. We include both firm-specific and market controls for all maturities. The results of our analysis are in Table 3-3. Columns (2) to (5) present the regressions results for one-, three-, seven-, and 10-year maturity contracts, respectively. The positive and significant coefficient on uncertain disclosure tone (UNCTONE) indicates that firms with higher uncertain tone have relatively higher change in spreads across all of these maturity contracts. More importantly, the coefficient on uncertain disclosure tone increases monotonically as the maturity decreases. The statistical significance of these coefficients is also higher at the short end of the term structure. Economically, as the uncertain tone measure moves from the 25^{th} to 75^{th} percentile, the change in spread for a one-year maturity contract is 3.2 basis points versus 1.5 basis points for a 10-year maturity contract. This dramatic difference in the impact of the uncertain tone measure on the term structure of CDS spreads is consistent with the theoretical result in Duffie and Lando, (2001).

In the last column, we explicitly examine the statistical significance of the impact of tone uncertainty on the slope of the term structure of credit spreads. We estimate the relationship between tone uncertainty and the change in the slope of the term structure measured using the difference between 10-year and one-year credit spreads. The slope change is also measured in excess of the median slope change for the CDS contracts with the same credit rating as the disclosing firm. Consistent with the monotonic decline in the uncertainty coefficient with maturity, we find that the change in the slope negatively relates to the uncertainty tone.

3.4.3 Effect of Issuer Ratings

Duffie and Lando, (2001) also show that the accounting precision of the firm's assets affects the short-term credit spreads of riskier firms (firms with low asset value)

more than safer firms (firms with higher asset value). This implies that the impact of the uncertain disclosure tone on CDS spread changes should be larger for firms with a relatively worse initial credit rating. We test this hypothesis by splitting the sample between investment grade and speculative grade rating categories.

Table 3-4 examines the relationship between uncertain disclosure tone and CDS spreads across firms with investment grade and speculative grade credit rating separately. We identify investment grade firms as those that have a Standard & Poor (S&P) long-term credit rating BBB- or better. Speculative grade firms are those that have an S&P long-term credit worse than BBB-. Columns (2) and (3) of Table 3-4 present the results of the regression in equation 3.1 for investment grade firms. Columns (4) and (5) present the results for speculative grade firms. The coefficient on the uncertain disclosure tone is positive and significant for both investment grade and speculative grade firms. However, as expected by hypothesis 3, the positive coefficient is significantly larger in magnitude for speculative grade firms compared to investment grade firms. For speculative grade firms, an increase in the uncertain disclosure tone from the 25^{th} to 75^{th} percentile is associated with almost five times (4.98 bps) greater change in CDS spreads than for investment grade firms (1.18 bps).

3.5 Alternative Explanations

We examine whether our findings are robust to other potential explanations around the disclosure event date. Specifically, we focus on the role of earnings surprise, management guidance, and other corporate events in the form of 8-K statements. Finally, we also examine the role of readability of financial statements in explaining our findings.

3.5.1 Earnings Surprise, Management Guidance, and Other Special Firm-Specific Events

Firms with negative earnings surprise around the disclosure date are likely to have an increase in credit spreads due to perceived increase in default probabilities. In our regression analysis, we explicitly control for several determinants of the changes in default probabilities. The variables such as change in firm size, cumulative returns, change in market-to-book ratio, and realized volatility are likely to capture the effect of

earnings surprise and therefore, the associated changes in default probabilities. Nevertheless, we explicitly account for the effect of earnings surprise in our regression analysis.

We define earnings surprise as the difference between the actual earnings per share and the median analyst estimate standardized by the price of the stock. In column (1) of Table 3-5, we repeat our regression analysis with earnings surprise as an additional control along with all firm and market controls. The positive coefficient on uncertain disclosure continues to be statistically significant and similar in magnitude even after controlling for earnings surprise. The coefficient and significance of other firm and market controls are also largely unaffected. The earnings surprise coefficient is negative, suggesting that firms with a positive surprise have a decline in CDS spreads. However, the coefficient is statistically insignificant.

Besides earnings, public companies must report certain material corporate events such as bankruptcy, financial misstatements, or other corporate major events in the 8-K statement. It is possible that such material events occur during our event window and convey additional default information, which results in changes in CDS spreads (e.g., Shivakumar, Urcan, Vasvari, and Zhang, 2011) To alleviate this possibility, we rerun our baseline specification by excluding event windows that coincide with special firm-specific events reported in the 8-K as well as management guidance.

Column (2) of Table 3-5 reports the results of regression analysis by excluding firms that release 8-K statements around the event dates. The specification includes all firm and market controls. The positive coefficient on the uncertain disclosure tone is largely similar in magnitude and continues to be statistically significant. In column (3), we drop the firms that have management guidance around the event date. Once again, we obtain a positive coefficient on uncertain disclosure tone and the statistical significance is even higher in this case. In column (4), we drop both the firms with 8-K statements and management guidance around the event date. The results are robust to dropping these firms.

In summary, our results immune to earnings surprise, firms issuing 8-K statements, or management guidance around the event dates. The positive effect of uncertain disclosure tone on CDS spreads changes continues to be statistically significant even after controlling for and dropping such events.

3.5.2 Disclosure Readability and Complexity

In this section, we examine the implications of 10-Q/K filing readability for the uncertain tone and CDS spread relation. Several studies show that firms with less readable and more complex disclosures are associated with higher search costs and hence, greater riskiness (Li, 2008; Lehavy, Li, and Merkley, 2011). One might argue that the observed increase in the riskiness of firms in our study might be due to the readability/complexity of such filings and not due to the tone of such disclosures. To test the explanation that our measure of uncertain tone may be capturing the complexity of filings, we include various measures of readability/complexity as additional controls in our base regression.

Following Li, (2008) and Loughran and McDonald, (2014), we consider four measures of readability/complexity, which include the log of file size, Kincaid index, Fog index, and Coleman-Liau index. We refer the reader to Li, (2008) for additional details about these readability/complexity indices. We include each of these indices separately as an additional control together with all firm and market controls. Table 3-6 presents our results of our regression analysis including these additional controls. The main conclusion from Table 3-6 is that our results are unaffected by including these readability indices. The magnitude of the coefficient on uncertain tone measure is unchanged and it continues to be positive and significant. Moreover, none of the readability indices has a significant impact on the changes in CDS spreads around the disclosure event date.

3.5.3 Other Word Lists

We now turn to other linguistic tones expressed in the 10-Q/K filings. Loughran and McDonald, (2013) argue that negative and weak modal words might also capture the underlying ambiguity as the uncertain words. Similarly, another proxy of uncertainty can be the net negative tone, that is, the difference between negative and positive tone in the 10-Q/K filings. Net negative tone captures managers' net aggregate sentiments about the future value of the firm. If the net negative tone is positive, then it reflects managers' pessimism about the future, which can lead to uncertainty around the true value of the firm and convey value-relevant information to credit markets. However, if both the alternate word lists and net negative tone capture the same source of ambiguity, then controlling for these variables in our baseline regression should make the coefficient of uncertain tone economically and statistically insignificant.

We test whether these alternative measures have incremental information beyond the uncertain tone in Table 3-7. We include alternative word lists such as negative, weak modal, and net negative tone (negative – positive) as control variables in our baseline regression. We find that negative tone is positively associated with changes in CDS spreads by itself; however, when we include the uncertain tone, the impact of negative tone weakens significantly. The economic magnitude drops by more than a quarter and statistical significance drops from five to 10 per cent. In addition, we do not see any significant association between a weak modal word list and net negative tone and changes in CDS spreads. Overall, the results in Table 3-7 suggest that uncertain tone captures distinct default risk information that other measures fail to capture.

3.6 Robustness Checks

We conduct the following additional tests to check the robustness of our results. First, we test the sensitivity of the results in Table 3-2 to alternative event window specifications. We replicate our baseline regression with varying lengths of event window centered around the 10-Q/K disclosure filing date such as (i) three-day window ([-1, +1]); (ii) seven-day window ([-3, +3]); (iii) 21-day window ([-10, +10]); and (iv) six-day window ([0, +5]). Our conclusions remain unchanged after these modifications. Second,

we examine whether the inclusion of financial firms affects our results. Financial firms are very different from nonfinancial firms because financial firms are highly regulated and often act as the dealers and counterparties in CDS contracts. Therefore, we exclude financial firms from our analysis. Column (5) of Table 3-8 reports these results. We find that excluding financial firms from our sample has little impact on our inferences. Lastly, we test whether the inclusion of the financial crisis period of 2007–2009 alters our conclusions. Lok and Richardson, (2011) argue that credit markets reacted differently during the financial crisis when all firms moved closer to their default points. They state, "researchers need to be careful when using spread data from the financial crisis period, especially the latter part of 2008 and early 2009." To make sure that our results are robust to financial crisis, we remove the crisis period from December 2007 to June 2009 from our sample data. Column (6) of Table 3-8 reports the results when we exclude the financial crisis period. The coefficient of interest is positive and statistically significant, which is very similar to column (3) of Table 3-2.

3.7 Conclusions

Accounting disclosures are an important source of information for investors. Beyond disclosing the quantitative information, these disclosures also contain qualitative information that helps investors assess the value of the firm. An important piece of qualitative information is the linguistic tone of the disclosure. The tone of the accounting disclosure is important because it contains value-relevant information beyond the current quantitative measures.

In this essay, we examine whether credit markets react to the linguistic tone of accounting disclosures. In particular, we focus on the uncertain tone of 10-Q/K filings of firms. We find that credit markets react, measured by changes in CDS spreads, negatively to the uncertain tone expressed in the firms' accounting disclosures. Consistent with the Duffie and Lando, (2001) model, we find that uncertainty expressed in the accounting disclosures affects the term structure of credit spreads. We find that CDS spreads with short-term maturities are more sensitive to the uncertain tone than long-term maturities. Taken together, these results underscore the importance of the linguistic tone of

accounting disclosures, which influences investors' assessments about the firms' future credit risks.

Our results have implications for managers as well as regulators. Because investors pay close attention to not only the quantitative information but also to how managers express their views in the disclosures, managers should be extremely careful in articulating firm-related information. The managers can significantly reduce valuation risks by simply choosing the right words. From a regulatory perspective, our results show the incremental valuation relevance of required qualitative information. Regulators can encourage firms to disclose more nonfinancial information that can improve the price discovery mechanism in the market.

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Table 3-1: Descriptive Statistics

Panel A: Distribution of Variables (Levels)						
Variable Name	**Mean**	**STD**	**P25**	**Median**	**P75**	**N**
CDS Spread (bps)	196.825	495.871	44.995	87.376	192.615	26,003
UNCTONE (%)	1.378	0.349	1.139	1.358	1.587	26,002
Size	8.973	1.412	8.042	8.959	9.863	25,377
ROA	0.010	0.039	0.004	0.011	0.0195	26,003
M/B	0.930	0.781	0.416	0.728	1.199	25,377
EPER (bps)	100.314	12.573	97.132	100.169	103.162	24,978
Rvol	0.345	0.221	0.209	0.287	0.403	24,984
VIX	20.021	9.368	13.690	17.580	22.810	25,935
Risk-free Rate (Rf) (bps)	142.338	171.769	9.000	31.000	247.000	26,001
Term Spread (TS) (bps)	205.501	111.692	149.000	223.000	283.000	26,001
Default Spread (DS) (bps)	267.464	85.154	205.000	266.000	306.000	26,001

Panel B: Distribution of Variables (Changes)						
Variable Name	**Mean**	**STD**	**P25**	**Median**	**P75**	**N**
ΔCDS Spread (bps)	0.466	109.866	-3.229	0.000	3.236	25,742
ΔSize	0.010	0.292	-0.070	0.026	0.113	24,632
ΔROA	0.000	0.048	-0.005	0.000	0.005	25,297
ΔM/B	0.000	0.187	-0.056	0.006	0.070	24,632
ΔVIX	0.240	4.184	-1.870	-0.080	1.920	25,935
ΔRf (bps)	-2.023	16.288	-3.000	16.288	3.000	25,935
ΔTS (bps)	-0.756	21.445	-13.000	-2.000	11.000	25,935
ΔDS (bps)	1.357	12.933	-5.000	2.000	8.000	25,935

This table reports the descriptive statistics of all the important variables used in regressions. CDS Spread is the five-year CDS spread on the event day. Uncertainty is the proportion of uncertainty words to the total number of words in the document as measured by Loughran and McDonald (2011). Size is the logarithm of the market capitalization of the firm. ROA is the return on assets. M/B is the market value of equity divided by the book value of the total assets of the firm. Event-period equity return is the cumulative daily equity returns calculated over the event period. Rvol is the realized volatility of the firm's daily equity returns over the past year. CR is the Standard & Poor credit rating of the firm. Risk-free Rate is the three-month U.S. Treasury bill rate. Term Spread is the difference between 10-year U.S. Treasury bond rate and the three-month U.S. Treasury bill rate. Default Spread is the Moody's corporate bond yield relative to the yield on 10-year Treasury bond rate. All the firm-specific change variables represent the change in value from the previous quarter. ΔCDS Spread, ΔVIX, ΔRf, ΔTS, and ΔDS represent the change in value over the event period. ΔCDS Spread is the change in five-year maturity CDS spreads over the event period relative to the median change in CDS spreads in the same credit rating group across the same period.

Table 3-2: The Effect of Uncertain Tone on the Change in CDS Spreads

DV:	**Change in CDS Spreads$_{i,[-5,+5]}$**		
	A	**B**	**C**
UNCTONE$_{i,t}$	3.336**	3.864***	3.890***
	(0.015)	(0.009)	(0.008)
ΔSize$_{i,t}$		-46.232**	-46.500**
		(0.016)	(0.015)
ΔM/B$_{i,t}$		32.690***	33.117***
		(0.003)	(0.002)
ΔROA$_{i,t}$		4.289	4.266
		(0.868)	(0.869)
EPER$_{i,t}$		-2.402***	-2.399***
		(0.000)	(0.000)
Rvol$_{i,t}$		-0.861	-2.136
		(0.966)	(0.915)
ΔVIX$_{[-5,+5]}$			-0.187
			(0.597)
ΔRf$_{[-5,+5]}$			0.125
			(0.162)
ΔTS$_{[-5,+5]}$			0.076
			(0.369)
ΔDS$_{[-5,+5]}$			0.514***
			(0.000)
Ind x Qtr FE	Yes	Yes	Yes
Adj R2	0.009	0.077	0.081
N	24,754	24,009	24,009

This table reports the effect of uncertain tone in 10-Q/K statements on the changes in CDS spreads around the event window [-5, +5] days of the disclosure. The dependent variable is the change in five-year maturity CDS spreads from a week before the disclosure to a week after the disclosure [-5, +5] relative to the median change in CDS spreads in the same credit rating group across the same time period. The independent variable of interest is the uncertainty word proportion as defined in the Appendix. The other independent variables consist of firm controls: change in size; change in return on assets (ROA); change in market-to-book ratio (M/B); event period return; and realized volatility (Rvol), and market controls: change in VIX; change in risk-free rate (Rf); change in term spread; change in default spread. All the firm-specific change variables represent the change in value from the previous quarter. ΔCDS Spread, ΔVIX, ΔRf, ΔTS, and ΔDS represent the change in value over the event period. The standard errors are clustered at firm level and the p-values are reported below the coefficient estimates. The sample period is from 2001 to 2016. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 3-3: Term Structure of CDS Spreads: Uncertain Tone and the Change in CDS Spreads

DV:	Change in CDS Spreads$_{i,[-5,+5]}$				
	1 Yr	**3 Yr**	**7 Yr**	**10 Yr**	**10 Yr–1 Yr**
$UNCTONE_{i,t}$	6.614***	5.196***	3.546**	3.230**	-3.281*
	(0.007)	(0.002)	(0.016)	(0.027)	(0.091)
$\Delta Size_{i,t}$	-61.711**	-52.020***	-39.400**	-38.232**	24.770**
	(0.013)	(0.007)	(0.017)	(0.022)	(0.025)
$\Delta M/B_{i,t}$	52.868***	36.981***	29.319***	28.024***	-25.946***
	(0.000)	(0.001)	(0.002)	(0.003)	(0.000)
$\Delta ROA_{i,t}$	-24.449	-14.257	-5.715	-11.507	12.651
	(0.555)	(0.617)	(0.802)	(0.591)	(0.638)
$EPER_{i,t}$	-3.709***	-2.429***	-2.428***	-2.270***	1.373***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Rvol_{i,t}$	-14.816	-12.032	2.294	8.969	23.099
	(0.688)	(0.616)	(0.904)	(0.614)	(0.385)
$\Delta VIX_{[-5,+5]}$	-0.736	-0.056	-0.073	-0.005	0.781**
	(0.199)	(0.881)	(0.832)	(0.991)	(0.018)
$\Delta Rf_{[-5,+5]}$	0.149	0.143	0.178*	0.125	-0.002
	(0.318)	(0.168)	(0.050)	(0.174)	(0.978)
$\Delta TS_{[-5,+5]}$	0.161	0.098	0.105	0.067	-0.082
	(0.259)	(0.333)	(0.222)	(0.435)	(0.258)
$\Delta DS_{[-5,+5]}$	0.458*	0.448***	0.530***	0.520***	0.066
	(0.071)	(0.005)	(0.000)	(0.000)	(0.696)
Ind x Qtr FE	Yes	Yes	Yes	Yes	Yes
Adj R2	0.068	0.071	0.086	0.085	0.022
N	21,902	23,019	22,889	22,558	21,292

This table reports the effect of uncertainty tone in 10-Q/K statements on the changes in CDS spreads around the event window [-5, +5] days of the disclosure. The dependent variable is the change in CDS spreads from a week before the disclosure to a week after the disclosure [-5, +5] relative to the median change in CDS spreads in the same credit rating group across the same time period. The other independent variables are the same as in Table 3-2. All the firm-specific change variables represent the change in value from the previous quarter. ΔCDS Spread, ΔVIX, ΔRf, ΔTS, and ΔDS represent the change in value over the event period. All columns have firm and market controls. We present the results for various maturity contracts (one-, three-, seven-, and 10-year). 10 Yr–1 Yr represents the change in 10-year CDS spreads minus the change in one-year CDS spreads in excess of the median change in the same rating group. The standard errors are clustered at firm level and the p-values are reported below the coefficient estimates. The sample period is from 2001 to 2016. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 3-4: Investment Grade and Speculative Grade Firms

DV:	**Change in CDS Spreads$_{i,[-5,+5]}$**			
	Investment Grade		**Speculative Grade**	
UNCTONE$_{i,t}$	2.601**	2.629**	11.103*	11.076*
	(0.013)	(0.011)	(0.085)	(0.084)
ΔSize$_{i,t}$	-33.281***	-33.391***	-57.399*	-58.523*
	(0.010)	(0.010)	(0.075)	(0.070)
ΔM/B$_{i,t}$	16.244**	16.347**	62.773**	63.700**
	(0.019)	(0.018)	(0.029)	(0.027)
ΔROA$_{i,t}$	2.631	2.932	-9.918	-11.921
	(0.735)	(0.707)	(0.790)	(0.750)
EPER$_{i,t}$	-1.236***	-1.216***	-2.978***	-2.953***
	(0.001)	(0.001)	(0.000)	(0.000)
Rvol$_{i,t}$	-25.080	-25.515	18.053	14.472
	(0.168)	(0.162)	(0.693)	(0.749)
ΔVIX$_{[-5,+5]}$		-0.023		0.243
		(0.884)		(0.827)
ΔRf$_{[-5,+5]}$		0.021		0.267
		(0.631)		(0.448)
ΔTS$_{[-5,+5]}$		0.015		0.183
		(0.669)		(0.590)
ΔDS$_{[-5,+5]}$		0.177***		1.554***
		(0.003)		(0.001)
Ind x Qtr FE	Yes	Yes	Yes	Yes
Adj R2	0.081	0.082	0.086	0.091
N	18,359	18,359	5,650	5,650

This table reports the effect of uncertain tone on 10-Q and 10-K statements on the changes in CDS spreads around the event window [-5, +5] days of the disclosure. The dependent variable is the change in five-year maturity CDS spreads from a week before the disclosure to a week after the disclosure [-5, +5] relative to the median change in CDS spreads in the same credit rating group across the same time period. The independent variable of interest is the uncertainty word proportion as defined in the Appendix. The other independent variables are the same as in Table 3-2. All the firm-specific change variables represent the change in value from the previous quarter. ΔCDS Spread, ΔVIX, ΔRf, ΔTS, and ΔDS represent the change in value over the event period. We present the results for sub-samples based on credit ratings. The standard errors are clustered at firm level and the p-values are reported below the coefficient estimates. The sample period is from 2001 to 2016. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 3-5: Earnings Surprise and Special Firm-Specific Events

DV:	Change in CDS Spreads$_{i,[-5,+5]}$			
	Earnings Surprise	**Excluding 8-K Statements**	**Excluding Management Guidance (MG)**	**Excluding 8-K and MG**
UNCTONE$_{i,t}$	3.320**	2.933**	4.449***	3.312**
	(0.011)	(0.031)	(0.005)	(0.029)
SUE$_{i,t}$	-17.083			
	(0.565)			
All Controls	Yes	Yes	Yes	Yes
Ind x Qtr FE	Yes	Yes	Yes	Yes
Adj R2	0.093	0.075	0.080	0.086
N	22,896	15,380	21,011	13,252

This table reports the effect of uncertain tone on 10-Q/K statements on the changes in CDS spreads around the event window [-5, +5] days of the disclosure. The dependent variable is the change in five-year maturity CDS spreads from a week before the disclosure to a week after the disclosure [-5, +5] relative to the median change in CDS spreads in the same credit rating group across the same time period. The independent variable of interest is the uncertain tone as defined in the Appendix. Earnings Surprise is defined as the actual earnings minus the median analyst estimate standardized by price of the stock. The other independent variables are the same as in Table 3-2. All the firm-specific change variables represent the change in value from the previous quarter. ΔCDS Spread, ΔVIX, ΔRf, ΔTS, and ΔDS represent the change in value over the event period. The standard errors are clustered at firm level and the p-values are reported below the coefficient estimates. The sample period is from 2001 to 2016. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 3-6: Report Readability, Uncertain Tone, and CDS Spreads

DV:	**Change in CDS Spreads$_{i,[-5,+5]}$**			
	Ln (File Size)	**Fog Index**	**Flesch-Kincaid**	**Coleman-Liau**
UNCTONE$_{i,t}$	3.895***	3.929***	3.935***	3.837***
	(0.008)	(0.008)	(0.008)	(0.008)
Readability$_{i,t}$	-0.072	0.225	0.314	0.207
	(0.903)	(0.606)	(0.495)	(0.733)
All Controls	Yes	Yes	Yes	Yes
Ind x Qtr FE	Yes	Yes	Yes	Yes
Adj R2	0.078	0.079	0.079	0.079
N	24,009	24,009	24,009	24,009

This table reports the effect of uncertainty tone on 10-Q/K statements on the changes in CDS spreads around the event window [-5, +5] days of the disclosure. The dependent variable is the change in five-year maturity CDS spreads from a week before the disclosure to a week after the disclosure [-5, +5] relative to the median change in CDS spreads in the same credit rating group across the same time period. The independent variable of interest is uncertain tone defined in the Appendix. Readability measures include: log of 10-Q/K filings size (in megabytes), as defined by Loughran and McDonald (2014); Fog Index is 0.4* (average number of words per sentence + per cent of complex words); Flesch-Kincaid Index is 0.39*(number of words/number of sentences) + 11.8*(number of syllables/number of words) – 15.59; Coleman- Liau Index is 0.0588*(average number of letters per 100 words) – 0.296*(average number of sentences per 100 words) – 15.8. The other independent variables are the same as in Table 3-2. All the firm-specific change variables represent the change in value from the previous quarter. ΔCDS Spread, ΔVIX, ΔRf, ΔTS, and ΔDS represent the change in value over the event period. The standard errors are clustered at firm level and the p-values are reported below the coefficient estimates. Industry X quarter fixed effects and credit rating fixed effects are included in all regressions. The sample period is from 2001 to 2016. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 3-7: Other Word Lists and CDS Spreads

DV:	**Change in CDS Spreads$_{i,[-5,+5]}$**						
	A	**B**	**C**	**D**	**E**	**F**	**G**
UNCTONE$_{i,t}$				3.413**	4.159**	3.504**	3.533**
				(0.014)	(0.011)	(0.012)	(0.016)
NEGTONE	1.879**			1.489*			
	(0.039)			(0.085)			
WEAK MODAL		3.804			-0.661		
		(0.244)			(0.869)		
Net (NEG – POS)			1.690*			1.331	
			(0.053)			(0.110)	
Harvard IV NEG							62.867
							(0.332)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ind X Qtr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.081	0.078	0.081	0.081	0.078	0.078	0.079
N	24,009	23,995	24,009	24,009	23,995	23,995	23,995

This table reports the effect of other word lists on the uncertain tone and changes in CDS spreads around the event window [-5, +5] days of the disclosure. The dependent variable is the change in five-year maturity CDS spreads from a week before the disclosure to a week after the disclosure [-5, +5] relative to the median change in CDS spreads in the same credit rating group across the same time period. The independent variable of interest is uncertain tone defined in the Appendix. Other word lists are from Loughran and McDonald (2011) and include: NEGTONE, defined as percentage of negative words in 10-Q/K filings; WEAK MODAL, defined as percentage of weak modal words in 10-Q/K filings. Net (NEG – POS) is the difference in percentage of negative and positive words in 10-Q/K filings. Harvard IV NEG is the list of negative words classified by Harvard Inquirer Dictionary. The other independent variables are the same as in Table 3-2. The standard errors are clustered at firm level and the p-values are reported below the coefficient estimates. The sample period is from 2001 to 2016. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 3-8: Robustness Checks: Alternate Event Window and Other Specifications

DV:	Changes in CDS Spreads					
	Alternate Window Specification				Non-Financial	Non-Crisis
	[-1, +1]	[-3, +3]	[-10, +10]	[0, +5]		
	A	B	C	D	E	F
$UNCTONE_{i,t}$	1.559*	3.711**	4.860***	3.371***	3.011**	2.950**
	(0.082)	(0.013)	(0.006)	(0.003)	(0.029)	(0.032)
All Controls	Yes	Yes	Yes	Yes	Yes	Yes
Ind x Qtr FE	Yes	Yes	Yes	Yes	Yes	Yes
Adj R2	0.020	0.070	0.098	0.090	0.077	0.038
N	24,110	24,027	23,900	24,061	19,907	21,071

This table reports the effect of uncertain tone on 10-Q/K on the changes in CDS spreads around the event window. The dependent variable is change in five-year maturity CDS spreads during the event window relative to the median change in CDS spreads in the same credit rating group across the same time period. The independent variable of interest is $UNCTONE_{i,t}$ defined in the Appendix. The other independent variables are the same as in Table 3-2. The standard errors are clustered at firm level and the p-values are reported below the coefficient estimates. The sample period is from 2001 to 2016. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Appendix to Chapter 3

Appendix 3-1: Variable Descriptions for Chapter 3

Variable Name	Description
CDS Change	CDS spread at the end of the event window minus the CDS spread at the beginning of the event window (basis points).
Uncertainty	The number of Loughran-McDonald Financial-Uncertainty words in the document divided by the total number of words in the document that occur in the master dictionary (percentage).
Size	Logarithm of the market value of the firm.
ROA	Net Income (NI) plus income from Extraordinary items and discontinued operations (XIDO) divided by the dollar amount of assets in the firm (AT).
M/B	Market Value of the Firm divided by the Book Value of the firm's assets.
Event period equity return (EPER)	Cumulative daily returns of the firm during the event period obtained from CRSP.
Realized volatility (Rvol)	Realized volatility (annualized) of the firm's daily equity returns over the past year.
VIX	Volatility Index is obtained from Chicago Board Options Exchange (CBOE).
Credit Rating (CR)	Standard & Poor credit rating of a firm's debt. CR takes values of 1 to 22 with AAA being the lowest value and D being the highest value.
Risk-free rate (Rf)	Three-month U.S. treasury bill rate.
Term Spread (TS)	Ten-year U.S. treasury bond rate minus the three-month treasury bill rate.

Default Spread (DS)	Moody's Baa Corporate bond yield relative to yield on 10-year treasury bond rate.
Earnings Surprise	Actual I/B/E/S earnings minus the median analysts' forecast, scaled by price at quarter end.
Fog Index	0.4*(average number of words per sentence + per cent of complex words).
Flesch-Kincaid	0.39*(number of words/number of sentences) + 11.8*(number of syllables/number of words) – 15.59.
Coleman-Liau	0.0588*(average number of letters per 100 words) – 0.296*(average number of sentences per 100 words) – 15.8.

Chapter 4

4 Does Managerial Structure in Mutual Funds Affect Window Dressing?

4.1 Introduction

Window dressing is an agency problem in the mutual fund industry where managers engage in portfolio manipulation by selling poorly performing stocks and buying stocks that performed well over the reporting period. As a result, they have a disproportionally higher percentage of well-performing stocks on the date of reporting. This practice is unfavourably looked upon by investors as it affects portfolio value through unnecessary trading costs and potentially priming the portfolio for lower future returns. This agency problem occurs because some managers have an incentive to hide their true managerial ability from investors. An important factor that affects the fund managers' incentives to window dress is the type of organizational (managerial) structure at their fund. However, there has been little research on how organizational structure dissuades fund managers from engaging in unproductive and undesirable efforts.

In this essay, I look at whether the type of organizational structure at mutual funds affect the likelihood of window dressing. Specifically, I look at whether team-managed funds (mutual funds with two or more fund managers) window dress less than single-managed funds (mutual funds with only one fund manager). Prior research shows that team-managed organizations can lower the inclination to engage in deceptive behaviour and that teams increase the cost of deception by greater peer monitoring (Arnott and Stiglitz, 1991; Mas and Moretti, 2009). Along with peer monitoring, individuals working in teams may also experience increased moral pressures such as guilt aversion (Charness and Dufwenberg, 2006). Teams also reduce the benefits of cheating by dividing the total output among several members, thus reducing each individual's monetary incentives to cheat (Ma, Moore, and Turnbull, 1988; Kandel and Lazear, 1992; Acemoglu, Kremer, and Mian, 2008). Additionally, some studies have found that fund managers are more likely to engage in window dressing behaviour when they have poor performance compared to the benchmark (Agarwal, Gay, and Ling, 2014; Meier and Schaumburg,

2004; He, Ng, and Wang, 2004; Ng and Wang, 2004). I add to this literature by investigating if team-managed funds reduce the level of window dressing compared to single-managed funds when they have poor performance.

I use data from Center for Research in Security Prices (CRSP), Thomson Reuters, and Morningstar Direct, which cover actively-managed U.S. domestic equity mutual funds from 1998 to 2015. I consider the following styles of mutual funds: aggressive growth, growth, and growth and income. Following Agarwal, Gay, and Ling, (2014), I measure the level of window dressing using backwards holdings return gap (BHRG), which is the difference between the quarterly return (net of expenses and trade costs) of a hypothetical portfolio comprising a fund's end of quarter holdings and the fund's actual quarterly return. After accounting for several fund-specific variables, such as total net assets under management, two-month performance, trading costs, and fund family size, I find that, conditional on inferior performance, team-managed funds window dress less by almost 50% when compared to single-managed funds. I also test if this effect increases when the number of managers on a team is increased. Most of the differences between team-managed and single-managed funds come from teams of two managers and teams of 4+ managers. For example, two-manager teams window dress less by almost 20 basis points and teams with 4+ managers windows dress less by almost 30 basis points when compared to their single-managed counterparts. However, the difference between single-managed funds and those funds with teams with three managers is not significantly different from zero in our sample and thus, I cannot conclude that window dressing decreases with increases in team size.

I next examine if the internal governance mechanism of a fund family has any impact on window dressing. Larger fund families tend to have more resources and better internal governance mechanisms. For example, in larger families, each fund has its own board of directors and an investment advisor, but in smaller fund families, a single board oversees the activities of all funds within the family (Khorana, 1996). This results in larger families monitoring their fund managers better and reducing the incentive of the fund manager to engage in window dressing. I find exactly this result, as team-managed funds do not differ from single-managed funds in the levels of window dressing among

large fund families. However, among smaller fund families where internal governance mechanisms are weaker, team-managed funds window dress less when compared to single-managed funds.

Finally, I examine if manager experience and age affect the window dressing incentives of a fund manager. Chevalier and Ellison, (1999) show that younger managers are more likely to get fired for poor performance compared to older managers and that career concerns and incentives differ vastly among more experienced, older managers vs younger managers. An experienced manager who has already achieved a high position in an industry is motivated to maintain that position. Thus, in periods of poor performance, older and more experienced managers are more likely to engage in window dressing and the results show exactly that. I find that team-managed funds window dress considerably less than their single-managed counterparts among more experienced managers, whereas, there is no difference between team-managed and single-managed funds among younger managers.

The essay makes two major contributions to the existing literature. First, this is the first essay in my knowledge to do a broad analysis on the effect of managerial structure on window dressing in mutual funds. I find that conditional on poor performance, team-managed funds window dress less than single-managed funds. This is possibly due to team-managed funds having greater peer monitoring along with reduced monetary and social incentives. These findings complement and extend the findings of Patel and Sarkissian, (2018) who find that managerial structure decreases "portfolio pumping," which is another kind of deceptive practice.[19] Second, I find that the impact of managerial structure is most effective when other governance mechanisms and incentive structures are not in place.

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[19] Portfolio pumping is another deceptive mutual fund activity where the fund manager purchases already held stocks to drive up stock prices and thereby fund values (Carhart, Kaniel, Musto, and Reed, 2002; Agarwal, Daniel, and Naik, 2011; Hu, Mclean, Pontiff, and Wang, 2014).

The remainder of this essay is organized as follows. The next section discusses related research and outlines our main predictions. Section 4.3 describes the data, sample selection, and variable construction. Section 4.4 reports the research design and main empirical tests related to how team-managed funds affect window dressing. Section 4.5 considers two important alternative explanations for our results. Section 4.6 provides a conclusion.

4.2 Prior Research and Hypotheses Development

4.2.1 Window Dressing in Mutual Funds

Investors evaluate a manager's skill by comparing the fund's past performance with a benchmark. However, this comparison may not suffice as stock returns are volatile and investors cannot know if a manager just got lucky or unlucky on some stock purchases. This results in investors also paying attention to the portfolio holdings as an additional signal to evaluate a manager's skill (Lakonishok, Shleifer, Thaler, and Vishny, 1991; Kacperczyk, Sialm, and Zhang, (2005, 2008); Cohen, Coval, and Pastor, 2005; Jiang, Yao, and Yu, 2007).

Window dressing in mutual funds is a form of manipulation in which the money managers alter their portfolio before the disclosure date to hide their true ability. This is usually done by buying (selling) stocks that have done exceptionally well (poorly) over the reporting period and results in disproportionally higher holdings of "good" stocks on the date of disclosure. There exists ample empirical evidence of window dressing among mutual funds. Lakonishok, Shleifer, Thaler, and Vishny, (1991) show that, in the months leading up to the reporting date, pension funds sell more poorly performing "loser" stocks, slow down the pace of sale of well performing "winner" stocks, increase the purchases of winner stocks, and decrease the purchases of loser stocks. Musto, (1997) shows that money market funds hold disproportionately more government securities just before the disclosure date to give an impression that they are safer and more conservative than they really are. Chevalier and Ellison, (1997) find that funds alter the composition of their portfolios at the end of the year towards high-quality, less-risky stocks. Meier and

Schaumbaug, (2004) find evidence of high turnover of stocks in the last days of the quarter and find that poor performing funds are more likely to report misleading holdings. He, Ng and Wang, (2004) and Ng and Wang, (2004) show that institutions whose portfolios have underperformed the market tend to sell more poorly performing stocks in proportion to their holdings than those whose portfolios have outperformed the market in the final quarter of the year. Agarwal, Gay and Ling, (2014) provide a rationale for why managers window dress. Investors can observe the fund return at the end of each quarter, but funds have up to a 60-day window to report their holdings. Investors know of the holdings only after the delay period and the performance during the delay period can affect the investor's interpretation of the two conflicting signals. If a poorly performing manager decides to window dress towards the end of the quarter, and if the fund performs well during the delay period, investors are less likely to attribute the signal conflict to window dressing and reward the fund with higher flows than otherwise. However, if the fund performs poorly during the delay period, then investors are more likely to attribute the signal conflict to window dressing and punish the fund with lower flows. Overall, window dressing behaviour is believed to be detrimental to investors' returns as it affects fund value through two ways: unnecessary trading costs, and potentially buying (selling) overpriced (underpriced) stocks, priming the portfolio for future lower returns.

4.2.2 Teams, Deception, and Window Dressing

The idea that groups and individuals act differently is divided into two groups: one that says decisions made by groups are inferior to that of individuals, and the other that argues decisions made by groups are superior to that of individuals. In economics, the negative effect of teams are associated with free-riding and indecisiveness, which result in loss of productivity (e.g., see Holmstrom, 1982; Rasmusen, 1987; Nalbantian and Schotter, 1997). Similarly in finance, some studies find no benefits of teamwork in enhancing the performance of professional money managers (e.g., Chen, Hong, Huang, and Kubik, 2004; Massa, Reuter, and Zitzewitz, 2010). However, there are many studies that show the positive effects of teams. For example, Sah and Stiglitz, (1986) and Sharpe, (1981) show that teams help diversify individuals' opinions. Barry and Starks, (1984) provide a theoretical setting suggesting that teams in investment funds may reduce

portfolio risk. Hamilton, Nickerson and Owan, (2003) find that teams increase productivity. Patel and Sarkissian, (2017) use equity mutual fund data and observe that team-managed funds outperform single-managed ones without resorting to extra risk taking.

As mentioned earlier, window dressing by mutual fund managers is a dishonest activity which negatively affects investor's returns. In times of poor fund performance, engaging in window dressing activity is a way to hide managerial skill. A team environment can change the temptation to window dress as it increases social pressure and enables peer-monitoring. Employees can experience disutility if they find that their peers engage in deceptive behaviour as the productivity of an employee is also a function of the productivity of their co-workers (Mas and Moretti, 2009). Peer monitoring is also important in labour markets as workers are often in a better position to monitor their co-workers than employers (Arnott and Stiglitz, 1991). Teams also provide different compensation structure and reduce the benefits of deception. Kandel and Lazear (1992) find that peer pressure and monitoring are more effective when all members of the organization share profits. Acemoglu, Kremer and Mian (2008) use a career concerns model and show that high powered incentives induce more productive effort from employees but also more unproductive efforts. They show that working in teams reduces the incentive to engage in unproductive and unethical behaviour. Patel and Sarkissian, (2018) show that team-managed funds engage less in portfolio pumping activity. Thus, I hypothesize that teams are less likely to window dress when they have poor performance.

4.3 Data, Sample Selection, and Variable Construction

4.3.1 Databases and Sample Selection

I use data from three sources: Center for Research in Security Prices (CRSP) database; Thomson Reuters Mutual Fund database; and Morningstar Direct database.

The CRSP data provide information on mutual funds' monthly returns, total net assets (TNA), inception date, fee structure, fund age, investment objectives, and other attributes. CRSP fund data are at the share class level (*crsp_fundno*), so I aggregate all fund characteristics at the individual fund level (*wficn*) based on their previous month's

TNA to obtain value-weighted averages of monthly returns, annual expense ratios, and turnovers. The holdings of each mutual fund are obtained from Thomson Financial on a quarterly or semi-annual basis. The Thomson Financial database also includes the style of the fund (Investment Objective Code). As the focus of this essay is on equity mutual funds, I exclude international, municipal bonds, balanced, and bonds and preferred funds. The remaining equity styles are aggressive growth, growth, and growth and income. This dataset is merged with the CRSP database using a common identifier (*wficn*) MFLINKS database from Wharton Research Data Services (WRDS).

Data on mutual fund managerial structure are obtained from Morningstar. The Morningstar database contains the names of fund managers responsible for the management of the fund each year and the exact joining and leaving dates of fund managers. I determine the managerial structure of funds based on the total number of fund managers at the end of each quarter. If a fund is managed by only one fund manager at the end of the calendar year, I classify that fund as single-managed. If a fund is managed by two or more fund managers, I classify that fund as team-managed. Further, I divide team-managed funds into funds with two, three, four (or more) distinct fund managers at the end of the calendar year, denoted 2FM, 3FM, and 4+FM, respectively. This Morningstar database is then merged with the CRSP-Thomson database using the fund cusip.[20] I remove all fund-quarters where fund manager names or tenure dates are missing and remove all funds that have a TNA of less than $10 million to remove the effect of very small funds. Our final sample covers unique funds with 2,525 unique funds and 69,045 fund-quarter observations from 1998–2015.

4.3.2 Variables Construction

Measure of Window Dressing

Backward Holdings Return Gap (BHRG) is the measure of window dressing. I follow Agarwal, Gay, and Ling, (2014) to compute backward holdings return gap, which

[20] For unsuccessful merges, I match them using fund name and verify using fund TNA.

is the difference between the quarterly return (net of expenses and trade costs) of a hypothetical portfolio comprising a fund's end of quarter holdings and the fund's actual quarterly return. The hypothetical portfolio is assumed to have been held throughout the quarter. The higher the BHRG measure, the greater the likelihood of window dressing.

Other Variables

Alpha- The daily alphas are estimated based on the four-factor model from Carhart, (1997). The daily alphas are summed to compute the 2-month alpha.

Manager Skill is the 12-month moving average of the monthly return gap as calculated by Kacperczyk, Sialm, and Zheng (2008). The monthly return gap is the difference between the actual fund return in a quarter and the return of a hypothetical portfolio with last-reported holdings that are assumed to have been held throughout the quarter. Kacperczyk, Sialm, and Zheng (2008) find that this measure is positively associated with the future returns of a mutual fund.

Trade Cost is estimated using estimates from Keim and Madhavan, (1997), similar to Wermers, (2000), who provide fitted regressions for total institutional execution costs.[21]

Fund family TNA is the total net assets under the mutual fund family. I use the fund family identifier (*mgmt_cd*) to identify the mutual fund family and aggregate the TNA of all the funds under it.

The other variables I use in the analysis are: *Style*, which is a series of dummy variables constructed from the investment objective code (IOC) from Thomson Financial database; *Fund TNA*, which is the total net asset value of the fund; *Fund Age*, which is the difference between a fund's inception year and the current year; *Expense*, which is the

[21] Refer to the Wermers, (2000) for more details.

mutual fund's annual expense ratio; and *Load dummy*, which is an indicator variable set to 1 if a fund has a front-end or back-end load and 0 otherwise.

4.4 Results

4.4.1 Descriptive Statistics

Table 4-1 (Panel A) shows the descriptive statistics and the correlations of all the important variables used in our analysis. The average fund TNA is around $1.3 billion, and the team-managed funds comprise around 65% of our observations. The mean value for backwards holdings return gap is 58 basis points and the median value is 21 basis points. Panel B of Table 4-1 shows the differences in fund characteristics between team-managed and single-managed funds. When compared to single-managed funds, teams window dress less by nine basis points every quarter. Panel C shows the correlations between all the variables used in our analysis. Teams are negatively associated with BHRG. Although these correlations use contemporaneous values, they indicate that team-managed funds window dress less than single-managed funds.

4.4.2 Determinants of Window Dressing

I modify the regression specification used in Agarwal, Gay, and Ling, (2014) to the following:

$$\begin{aligned} WD_{i,t} = {} & \beta_0 + \beta_1 Alpha_{i,t} + \beta_2 ManagerSkill_{i,t-1,} + \beta_3 Expense_{i,t-1} \\ & + \beta_4 Log(TNA)_{i,t-1} + \beta_5 Tradecost_{i,t-1} + \beta_6 Loaddummy_{i,t-1} \\ & + \beta_7 Log(FFTNA)_{i,t-1} + \beta_8 Fundage_{i,t-1} + Styledummies \\ & + Timedummies + \epsilon_{i,t} \end{aligned} \quad (4.1)$$

where $WD_{i,t}$ is the window dressing measure (remember to elaborate BHRG 10% dummy) for fund i in quarter t. $Alpha_{i,t}$ is the 2-month alpha of fund i, over the first two

months of the quarter t. $\epsilon_{i,t}$ is the error term. The other variables are the same as mentioned in section 4.3.2. All the right-hand side variables except alpha are measured at the beginning of the quarter (end of last quarter). I cluster standard errors at the fund level. Table 4-2 reports the results of the regression. As expected, window dressing is negatively related to the alpha and manager skill. The results are similar even in the second regression specification where $WD_{i,t}$ is an indicator variable equal to 1 if the BHRG measure belongs in the top 10th percentile in the quarter and 0 otherwise.

4.4.3 Do Team-managed Funds Reduce Window Dressing?

Table 4-3 presents the results of the impact of teams on window dressing. The first two columns are very similar to Table 4-2 but with a $Team_{i,t-1}$ variable. The coefficient on $Team_{i,t-1}$ is negative and significant only for the probit regression (first column). It shows that teams are less likely to be among the top window dressers. In the second column, which is a regular OLS, the coefficient on $Team_{i,t-1}$ is not significant. But as observed by Agarwal, Gay, and Ling, (2014); Meier and Schaumburg, (2004); He, Ng, and Wang, (2004); and Ng and Wang, (2004), the funds that perform poorly are the most likely to window dress to hide their true managerial ability. I find similar results in my sample where the BHRG measure is higher at lower levels of performance. To answer the question if teams reduce window dressing in mutual funds, I need to compare the difference in window dressing at lower levels of performance where funds are more likely to window dress. Figure 1 shows the difference in levels of window dressing among single-managed funds and team-managed funds at various levels of performance. The difference in the BHRG measure between single-managed and team-managed funds is considerably higher and significant at the lowest two deciles of performance. To test this in a multivariate setting, I estimate the following regression:

$$WD_{i,t} = \beta_0 + \beta_1 Team_{i,t-1} + \beta_2 Team_{i,t-1}\, x\, BottomPerf_{i,t} + \beta_3 BottomPerf_{i,t} + \beta_4 Alpha_{i,t} + \beta_5 ManagerSkill_{i,t-1,} + \beta_6 Expense_{i,t-1} + \beta_7 Log(TNA)_{i,t-1} + \beta_8 Tradecost_{i,t-1} + \beta_9 Loaddummy_{i,t-1} + \beta_{10} Log(FFTNA)_{i,t-1} + \beta_{11} Fundage_{i,t-1} + Styledummies + Timedummies + \epsilon_{i,t} \quad (4.2)$$

where $Team_{i,t-1}$ is a dummy variable that is equal to 1 if a fund is team-managed and 0 otherwise. *BottomPerf* is a dummy variable that is equal to 1 if the performance rank is in the last two deciles and 0 otherwise. $Team_{i,t-1}\, x\, BottomPerf_{i,t}$ is an interaction term that captures the effect of team-managed funds when fund performance is poor. The rest of the variables are the same as in equation 4.1. The hypothesis is that team-managed funds window dress less than single-managed funds, especially when the fund has poor performance. For this to be correct, $\beta 2+\beta 3 < \beta 3$ or $\beta 2$ should be negative. The third column of Table 4-3 presents the results of equation 4.2. The coefficient on the interaction term $\beta 2$ is negative and statistically significant. This means that among poorly performing funds every quarter, team-managed funds window dress less by 20 basis points (almost 50%), when compared to single-managed funds.

I next look at whether team size has any impact on the level of window dressing. If the portfolio is divided into equal parts, then each manager gets to manage only a part of the incentive. Also, if the monitoring effect increases with team size, then I should observe lower levels of window dressing with increases in team size. Table 4-4 reports the results of the regression where column (1) compares the differences between single-managed funds and teams with two managers. Column (2) compares the differences between single-managed funds and teams with three managers, and column (3) compares the differences between single-managed funds and teams with four+ managers. The coefficient on the interaction term β2 is negative, but significant only in the first and the third regression. Teams with two managers window dress less by 20 basis points compared to single-managed funds and teams of four+ managers window dress less by 30

basis points compared to single-managed funds. When comparing single-managed funds with teams of three managers, the coefficient is insignificant. Thus, I am unable to conclude that window dressing activity reduces with increases in team size.

4.5 Alternative Explanations

4.5.1 Internal Governance

Ding and Wermers (2012) show that the mutual funds with better internal governance mechanism perform better. They also show that fund families with more independent directors are more likely to terminate underperforming inexperience managers. This internal governance mechanism is dependent on the board of directors/trustees, the investment advisor, and the underlying compensation contract. In larger fund families, each fund typically has its own board of directors and an investment advisor; but in smaller fund families, a single board oversees the activities of all funds within the family (Khoranna, 1996). Fund managers from smaller fund families are more likely to engage in window dressing behaviour than from larger fund families due to lower monitoring. Thus, I expect that there should not be any difference in the window dressing levels between team-managed funds and single-managed funds in fund families with stronger internal governance. On the other hand, I expect a significant difference between the window dressing levels of team-managed and single-managed funds among fund families with weaker internal governance. I use the fund family's TNA as a proxy for the strength of internal governance, as larger fund families have more resources to monitor their fund managers. Table 4-5 presents the results of the regression where the sample is split into two: fund family TNA is below the median and fund family TNA is above the median. The results are in line with the prediction and the coefficient on $Team_{i,t-1}\ x\ BottomPerf_{i,t}$ is negative and significant for funds that belong to smaller fund families and the coefficient is insignificant for funds that belong to fund families.

4.5.2 Manager Experience

Another explanation that can affect window dressing is the age of the manager. The theoretical models of Scharfstein and Stein, (1990), Zwiebel, (1995), and Avery and Chevalier, (1999) predict that, in particular environments, managers' career concerns

may lead them to "herd" on a common action. Chevalier and Ellison, (1999) provide empirical evidence to show that a mutual fund manager's behaviour is affected by career concerns. They find that even after controlling for performance, younger managers are more likely to be punished for deviating from the herd. They show that the risk incentives are very different for younger managers who have a whole career ahead of them than for older managers who have potentially already reached a high position in the industry. The older manager in a high position is motivated by the desire to maintain that position and thus, is more likely to window dress. Therefore, I expect that there should not be any difference in the window dressing levels between team-managed funds and single-managed funds among younger managers with career concerns, and that there should be a significant difference between the window dressing levels of team-managed and single-managed funds among older managers. I use the average industry tenure of the managers of the mutual fund to proxy for their experience in the industry. Table 4-6 reports the results of the regression where the *Average Manager Industry Tenure* is added as a control variable to the main specification. As expected, the variable is positive and significantly associated with window dressing. The second and third columns of Table 4-6 report the results of the regression where the sample is split into two categories: average industry tenure is below the median and average industry tenure is above the median. The results are in line with the prediction and the coefficient on $Team_{i,t-1}\ x\ BottomPerf_{i,t}$ is insignificant for funds that have younger managers but is negative and significant for funds with older fund managers with a reputation to protect.

4.6 Conclusions

In this essay, I use a sample of active domestic U.S. equity mutual funds from September 1998 to December 2015 to examine the impact of managerial structure on their window dressing behaviour. The window dressing measure (BHRG) is measured at a quarterly level following Agarwal, Gay, and Ling, (2014). I find that team-managed mutual funds window dress less than single-managed funds when the performance of the fund is poor. The peer monitoring effect of teams is especially significant when the internal governance of the fund family is not strong. I also find that older, more experienced managers are more likely to engage in window dressing behaviour due to different career concerns. These results hold irrespective of the additional controls related to manager skill, fund size, turnover, and trade costs that can affect the propensity of a manager to window dress. Given that window dressing is detrimental to mutual fund value, these findings are significant and show that peer monitoring and the social benefits of team-based organizational structure are helpful in reducing deceptive activity in the mutual fund industry.

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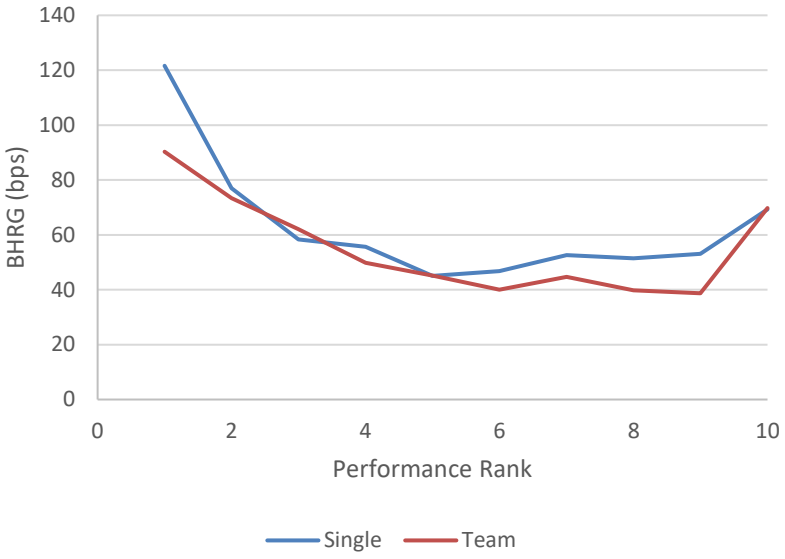

Figure 1: Window Dressing by Performance and Managerial Structure

Table 4-1: Descriptive Statistics

Panel A: Summary Statistics

Variable	N	Mean	Median	Min	Max	Std
Team	69,045	0.6586	1.0000	0.0000	1.0000	0.4742
BHRG	69,045	0.0058	0.0021	-0.0676	0.1230	0.0285
Manager Skill	69,045	-0.0001	-0.0001	-0.0096	0.0098	0.0035
2-month alpha	69,045	0.0033	0.0032	-0.0883	0.0918	0.0327
TNA ($ million)	69,045	1,323.71	294.60	10.00	21,310.70	3,013.96
Expense	69,045	0.0126	0.0121	0.0040	0.0252	0.0043
Flow	69,045	0.0029	-0.0146	-0.2776	0.5906	0.1237
Turnover	69,045	0.1042	0.0724	0.0000	0.5547	0.1077
Trade Cost	69,045	0.0010	0.0005	0.0000	0.0072	0.0013
Fund Age	69,045	15.15	11.00	1.00	91.00	13.2817
Fund Family TNA ($ million)	69,045	20,877.68	4,579.60	10.00	284,236.40	46,462.38

Panel B: Teams and Single-managed Funds

Variable	Team		Single		Difference (Team minus Single)	P value
	N	Mean	N	Mean		
BHRG	45,473	0.0055	23,572	0.0064	-0.0009	<.001
Manager Skill	45,473	-0.0001	23,572	0.0000	-0.0001	<.001
2-month alpha	45,473	0.0031	23,572	0.0036	-0.0004	0.0480
TNA ($ million)	45,473	1,291.04	23,572	1,386.73	-95.6900	<.001
Flow	45,473	0.0023	23,572	0.0041	-0.0018	<.001
Expense	45,473	0.0124	23,572	0.0128	-0.0003	<.001
Turnover	45,473	0.1018	23,572	0.1088	-0.0070	<.001
Trade Cost	45,473	0.0010	23,572	0.0011	-0.0001	<.001
Fund Age	45,473	14.93	23,572	15.44	-0.5122	<.001
Fund Family TNA ($ million)	45,473	14,435.09	23,572.00	33,516.27	-19,081.18	<.001

Panel C: Correlations

	Team	BHRG	Manager Skill	2-month alpha	TNA	Expense	Flow	Turnover	Fund Age	Family TNA
BHRG	-0.02									
Manager Skill	-0.02	-0.01								
2-month alpha	-0.01	-0.05	-0.02							
TNA	-0.02	-0.03	-0.03	0.01						
Expense	-0.04	0.04	0.02	0.00	-0.28					
Flow	-0.01	-0.04	0.06	0.13	-0.01	0.01				
Turnover	-0.03	0.35	0.04	0.02	-0.13	0.12	0.01			
Trade Cost	-0.04	0.21	0.08	-0.09	-0.17	0.22	-0.03	0.67		
Fund Age	-0.02	-0.01	-0.02	-0.01	0.38	-0.20	-0.10	-0.09	-0.17	
Fund Family TNA	-0.02	-0.01	0.03	-0.01	0.41	-0.28	-0.01	-0.07	-0.15	0.23

This table reports the descriptive statistics of all the important variables used in regressions. Team is a dummy variable, which is equal to one if more than one manager manages the mutual fund. BHRG is the Backward Holdings Return Gap calculated as the quarterly return (net of expenses and trade costs) of a hypothetical portfolio comprising a fund's end-of-quarter holdings that are assumed to have been held throughout the quarter, and the fund's actual quarterly return. Manager Skill is the 12-month moving average of the monthly return gap. 2-month alpha is the alpha estimated based on the four-factor model of Carhart (1997). TNA is the total net asset value of the fund. Expense is the mutual fund's annual expense ratio. Turnover is the minimum of the dollar values of purchases and sales in a quarter, divided by the total net assets at the beginning of the quarter. Fund Age is the age of the fund expressed in years. Fund Family TNA is the total net asset value of the mutual fund's family. Panel A describes the summary statistics. Panel B shows the differences in characteristics between team-managed and single-managed funds. Panel C presents the correlations between all the variables. The sample period is from 1999 to 2015. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 4-2: Determinants of Window Dressing

	BHRG	*BHRG 10% Dummy*
2-month alpha$_t$	-0.061***	-2.623***
	(0.000)	(0.000)
Manager Skill$_{t-1}$	-0.340***	-10.414**
	(0.002)	(0.020)
Expense$_{t-1}$	0.085	19.097***
	(0.295)	(0.000)
Log(TNA)$_{t-1}$	-0.203	-26.001
	(0.354)	(0.081)
Trade Cost$_{t-1}$	-0.639***	0.116
	(0.008)	(0.989)
Load$_{t-1}$	-0.000	-0.029
	(0.808)	(0.532)
Turnover$_{t-1}$	0.077***	3.461***
	(0.000)	(0.000)
Log(FFTNA)$_{t-1}$	0.178	1.803
	(0.346)	(0.881)
Fund Age$_{t-1}$	0.049**	3.167**
	(0.029)	(0.045)
Time and Style Dummies	Yes	Yes
Adjusted R2	0.116	0.110
Number of Observations	64,161	64,161

This table reports the results of the regression on the window dressing measure BHRG (Backward Holdings Return Gap) on fund characteristics. *BHRG 10% Dummy* is an indicator variable, which is equal to 1 if BHRG is in the top 10th percentile for a given quarter. The independent variables consist of: 2-month alpha; Manager Skill; Expense; Log(TNA); Trade Cost; Load dummy variable, which is equal to 1 if a fund charges a front load and 0 otherwise; Turnover; Log(FFTNA), which is the logarithm of Fund Family TNA; and Fund Age. The coefficients of Log(TNA), Log(FFTNA) and Fund Age have been multiplied by 1,000. The standard errors are clustered at firm level and the p-values are reported below the coefficient estimates. The sample period is from 1999 to 2015. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 4-3: Teams and Window Dressing

	BHRG 10% Dummy	*BHRG*	*BHRG*
Team	-0.077**	-0.000	0.000
	(0.043)	(0.700)	(0.845)
Team x Bottom Performance			-0.002**
			(0.024)
Bottom Performance			0.004***
			(0.000)
2-month alpha$_t$	-2.618***	-0.061***	
	(0.000)	(0.000)	
Manager Skill$_{t-1}$	-10.589**	-0.341***	-0.336***
	(0.017)	(0.002)	(0.003)
Expense$_{t-1}$	18.839***	0.084	0.077
	(0.000)	(0.301)	(0.343)
Log(TNA)$_{t-1}$	-24.920*	-0.200*	-0.189*
	(0.093)	(0.363)	(0.386)
Trade Cost$_{t-1}$	-0.364	-0.641***	-0.630***
	(0.966)	(0.008)	(0.009)
Load$_{t-1}$	-0.030	-0.000	-0.000
	(0.518)	(0.808)	(0.834)
Turnover$_{t-1}$	3.466***	0.078***	0.077***
	(0.000)	(0.000)	(0.000)
Log(FFTNA)$_{t-1}$	0.628	0.174	0.189
	(0.958)	(0.361)	(0.319)
Fund Age$_{t-1}$	2.966*	0.048*	0.048*
	(0.060)	(0.031)	(0.032)
Time and Style Dummies	Yes	Yes	Yes
Adjusted R2	0.111	0.116	0.115
Number of Observations	64,161	64,161	64,161

This table reports the results of the regression on the window dressing measure BHRG (Backward Holdings Return Gap) on team-managed funds and fund characteristics. *BHRG 10% Dummy* is an indicator variable, which is equal to 1 if BHRG is in the top 10th percentile for a given quarter. The main independent variables are team and the interaction of team with the bottom performance. Bottom Performance is equal to 1 if the fund belongs to the bottom quintile of 2-month alpha. The rest of the independent variables are the same as in Table 4-2. The standard errors are clustered at fund level and the p-values are reported below the coefficient estimates. The sample period is from 1999 to 2015. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 4-4: Team Size and Window Dressing

	Single vs 2 Managers	*Single vs 3 Managers*	*Single vs 4+ Managers*
Team	0.001	-0.000	0.001*
	(0.425)	(0.917)	(0.065)
Team x Bottom Performance	-0.002**	-0.001	-0.003***
	(0.015)	(0.424)	(0.006)
Bottom Performance	0.004***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)
Manager $Skill_{t-1}$	-0.481***	-0.374**	-0.377**
	(0.000)	(0.017)	(0.027)
$Expense_{t-1}$	0.066	0.043	-0.010
	(0.502)	(0.687)	(0.926)
$Log(TNA)_{t-1}$	-0.162	0.080	0.039
	(0.572)	(0.800)	(0.906)
Trade $Cost_{t-1}$	-0.546*	-0.442	-0.375
	(0.090)	(0.212)	(0.361)
$Load_{t-1}$	0.000	0.000	0.001
	(0.764)	(0.796)	(0.584)
$Turnover_{t-1}$	0.077***	0.079***	0.078***
	(0.000)	(0.000)	(0.000)
Log (Fund Family TNA) $_{t-1}$	0.282	0.037	0.008
	(0.204)	(0.883)	(0.976)
Fund Age_{t-1}	0.059**	0.047**	0.054**
	(0.038)	(0.138)	(0.122)
Time and Style Dummies	Yes	Yes	Yes
Adjusted R2	0.113	0.118	0.119
Number of Observations	40,999	32,059	27,287

This table reports the results of the regression on the window dressing measure BHRG (Backward Holdings Return Gap) on team-managed funds and fund characteristics. The main independent variables are team and the interaction of team with the bottom performance. Bottom Performance is equal to 1 if the fund belongs to the bottom quintile of 2-month alpha. The rest of the independent variables are the same as in Table 4-2. The first column only contains observations of mutual funds with 1 manager and 2 managers. The second column only contains observations of mutual funds with 1 manager and 3 managers, and the final column only contains observations with 1 manager and 4+ managers. The standard errors are clustered at fund level and the p-values are reported below the coefficient estimates. The sample period is from 1999 to 2015. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 4-5: Fund Family Governance and Window Dressing

	Fund Family TNA <Median	Fund Family TNA>Median
Team x Bottom Performance	-0.002**	-0.001
	(0.049)	(0.469)
Team	-0.000	0.000
	(0.716)	(0.845)
Bottom Performance	0.005***	0.002***
	(0.000)	(0.006)
Manager $Skill_{t-1}$	-0.335***	-0.336***
	(0.003)	(0.003)
$Expense_{t-1}$	0.092	0.028
	(0.417)	(0.787)
$Log(TNA)_{t-1}$	0.220	-0.101
	(0.499)	(0.658)
Trade $Cost_{t-1}$	-0.603*	-0.859***
	(0.059)	(0.005)
$Load_{t-1}$	-0.001	0.001
	(0.385)	(0.370)
$Turnover_{t-1}$	0.087***	0.068***
	(0.000)	(0.000)
Fund Age	0.012	0.057
	(0.732)	(0.032)
Time and Style Dummies	Yes	Yes
Adjusted R2	0.130	0.097
Number of Observations	31,645	34,793

This table reports the results of the regression on the window dressing measure BHRG (Backward Holdings Return Gap) on team-managed funds and fund characteristics. The main independent variables are team and the interaction of team with the bottom performance. Bottom Performance is equal to 1 if the fund belongs to the bottom quintile of 2-month alpha. The independent variables are the same as in Table 4-2. The first column only contains observations where the Fund Family TNA is below the median Fund Family TNA. The second column only contains observations where the Fund Family TNA is above the median. The standard errors are clustered at fund level and the p-values are reported below the coefficient estimates. The sample period is from 1999 to 2015. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Table 4-6: Manager Industry Tenure and Window Dressing

	Full Sample	Tenure < 5 years	Tenure >= 5 years
Team	0.000	0.001	-0.000
	(0.686)	(0.280)	(0.502)
Bottom Performance	0.004***	0.004***	0.004***
	(0.000)	(0.000)	(0.000)
Team x Bottom Performance	-0.002**	-0.001	-0.002**
	(0.022)	(0.268)	(0.033)
Manager $Skill_{t-1}$	-0.360***	-0.469***	-0.177
	(0.001)	(0.002)	(0.230)
$Expense_{t-1}$	0.063	0.100	0.074
	(0.449)	(0.364)	(0.449)
$Log(TNA)_{t-1}$	-0.227	0.374	-0.619
	(0.299)	(0.186)	(0.025)
Trade $Cost_{t-1}$	-0.677***	-0.799**	-0.529**
	(0.006)	(0.028)	(0.032)
$Load_{t-1}$	0.000	-0.001	0.000
	(0.996)	(0.286)	(0.579)
$Turnover_{t-1}$	0.080***	0.077***	0.078***
	(0.000)	(0.000)	(0.000)
$Log(FFTNA)_{t-1}$	0.206	-0.168	0.468
	(0.282)	(0.534)	(0.031)
Fund Age	0.046**	0.040**	0.059**
	(0.039)	(0.190)	(0.026)
Avg Manager Industry $Tenure_{t-1}$	0.094*		
	(0.074)		
Time and Style Dummies	Yes	Yes	Yes
Adjusted R2	0.119	0.104	0.130
Number of Observations	62,286	28,473	37,539

This table reports the results of the regression on the window dressing measure BHRG (Backward Holdings Return Gap) on team-managed funds and fund characteristics. The main independent variables are team and the interaction of team with the bottom performance. Bottom Performance is equal to 1 if the fund belongs to the bottom quintile of 2-month alpha. The independent variables are the same as in Table 4-2 with the addition of Average Manager Industry Tenure. The first column contains all the observations. The second column only contains observations where the average tenure is below the median. The second column only contains observations where the average tenure is above the median. The standard errors are clustered at fund level and the p-values are reported below the coefficient estimates. The sample period is from 1999 to 2015. Statistical significance levels of 1%, 5%, and 10% are indicated by ***, **, and *, respectively.

Chapter 5

The thesis contributes to the finance literature in the following ways. Chapter 2 contributes to the growing literature on the role of investors on the corporate social responsibility of a firm. I employ a novel measure of measuring CSR-friendly and CSR-unfriendly ownership. Using a sample of all-equity U.S. mutual funds, I compute a CSR score for every mutual fund based on their holdings. Using this measure, I identify a mutual fund as CSR-friendly or CSR-unfriendly and then calculate the total amount of CSR-friendly and CSR-unfriendly ownership in a firm in each year. The results also show that CSR-friendly and CSR-unfriendly ownership are important determinants of a firm's CSR. Upon further investigation, the results reveal that CSR-friendly ownership is associated with future increases in CSR strengths and future decreases in CSR weaknesses. Likewise, CSR-unfriendly ownership is associated with future decreases in CSR strengths and has no effect on the future changes in the CSR weaknesses of a firm. The study also shows a direct channel through which CSR-friendly mutual funds can affect the CSR of a firm. Firms with higher CSR-friendly ownership are more likely to have executive compensation contracts linked to social performance.

Chapter 3 highlights the importance of linguistic tone in the pricing of CDS contracts in credit markets alongside "quantitative" information from accounting disclosures. We find that credit markets react, measured by changes in CDS spreads, negatively to the uncertain tone expressed in the firms' accounting disclosures. Consistent with the Duffie and Lando (2001) model, the results show that uncertainty expressed in the accounting disclosures affects the term structure of credit spreads and that short-term maturities are more sensitive to the uncertain tone than long-term maturities. Taken together, these results underscore the importance of the linguistic tone of accounting disclosures, which influences investors' assessments about the firms' future credit risks.

These findings add to the existing accounting and finance literature that has mainly focused on the quantitative aspects of accounting disclosures in the pricing of CDS contracts such as earnings, accrual, and cash flow information. The results also add

to the growing literature that examines the impact of textual analysis on valuation of financial assets. Our results have implications for managers as well as regulators. As investors pay close attention to not only the quantitative information but also to how managers express their views in the disclosures, managers should be extremely careful in articulating firm-related information. The managers can significantly reduce valuation risks by simply choosing the right words. From a regulatory perspective, our results show the incremental valuation relevance of required qualitative information. Regulators can encourage firms to disclose more nonfinancial information that can improve the price discovery mechanism in the market.

In Chapter 4, I use a sample of active domestic U.S. equity mutual funds from September 1998 to December 2015 to examine the impact of managerial structure on the window dressing behaviour. Window Dressing is measured at a quarterly level by computing the backwards holdings return gap. I find that team-managed mutual funds window dress much less than single-managed funds when the performance of the fund is poor. I also investigate the circumstances under which team-managed funds have the most impact in reducing window dressing and find that older, more experienced managers are more likely to engage in window dressing behaviour due to different career concerns. I also find that team-managed funds reduce window dressing mostly when other monitoring mechanisms are weaker (smaller fund families). These results hold irrespective of the additional controls related to manager skill, fund size, turnover, and trade costs that can affect the propensity of a manager to window dress. Given that window dressing is value destroying, these findings are significant and show that peer monitoring and the social benefits of team-based organizational structure are helpful in reducing deceptive activity in the mutual fund industry when other monitoring mechanisms are not effective.

Curriculum Vitae

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