ABSTRACT

Title of Dissertation: NONDISCLOSURE – A GOOD NEWS
                                   SIGNAL?

                                   Kyungran Lee, Doctor of Philosophy, 2016

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     I examine the implications of nondisclosure in a setting where there is a

credible signal as to the proprietary nature of the undisclosed information.

Specifically, I investigate the market and analysts' response to firms' application to

the Securities and Exchange Commission (SEC) for a confidential treatment order

(CTO), which allows firms to redact required disclosures from SEC filings when the

redacted information is proprietary. I find that the market and analysts react favorably

to the voluntary nondisclosure of proprietary information using the SEC confidential

treatment process. Market and analysts reactions are more favorable to the redaction

of information that is more likely to have proprietary value, such as information

related to research and development. In addition, I show that the redacting firms

experience superior accounting performance compared to their peers in the years

following the redaction, consistent with the market and analysts' response to the

redaction. However, I find that analysts engage in more intense private information search in response to a CTO redaction. This finding suggests that, although a CTO redaction can signal the nature of undisclosed information, analysts believe that the signal is not fully revealing of the economic magnitude of the undisclosed information. Overall, this study's findings indicate that a firm's willingness to submit to the CTO approval process serves as a credible signal of the proprietary nature of the withheld information. The results of this study suggest a possible role for a credible signaling channel to facilitate communication between insiders and outsiders regarding the nature of withheld information.

NONDISCLOSURE – A GOOD NEWS SIGNAL?

by

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2016

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Acknowledgements

I am deeply grateful for my graduate school experience at the University of Maryland. These past five years have nurtured and encouraged me as a researcher, a teacher and most of all, an individual. Joining the Robert H. Smith School of Business was one of the best opportunities I have been granted in my life. I received an incredible amount of support and help from the professors, staff, and other students while I was in graduate school. I certainly know that the space here in "Acknowledgements" is not enough to show what they did for me during all those years and how much I appreciate them.

I would particularly like to thank my advisor, Michael Kimbrough, for his extraordinary mentorship. I feel extremely grateful and privileged in having Michael as my advisor. His patience and support made me finish my doctoral degree. I cannot imagine another advisor who would put in as much time, thought, and effort into helping his students as Michael. He encouraged me to develop analytical thinking and research skills and greatly guided me with academic writing. Michael is my role model as a researcher, a teacher, and of course, a person. My continuous goal is to be able to think, write and express my thoughts and to be a caring mentor like him.

I would like to thank my dissertation committee members: Oliver Kim, Hanna Lee, Emanuel Zur, and Erkut Ozbay for valuable comments, suggestions, and support. Along with my advisor, they provided me with deep insight on my dissertation. I also thank Nick Seybert and Rebecca Han for their interest in my dissertation and suggestions. In addition, I thank all other faculty members: Stephen

Brown, Shijun Cheng, Seb Demirkan, Larry Golden, Marty Loeb, Steve Loeb, Jim Staihar, Musa Subasi for their support.

I appreciate comments from seminar participants at the 2015 Accounting PhD Rookie Recruiting & Research Camp, the Hong Kong University, the Chinese University of Hong Kong, the Hong Kong Polytechnic University, the National University of Singapore, the University of Melbourne, the University of Maryland, 2015 Midwest Region Meeting, and 2015 Northeast Region Meeting, especially David Seung-Hyun Koo (2015 Midwest Region Meeting discussant), Todd Kravet (2015 Northeast Region Meeting discussant), and two anonymous reviewers.

Of course, above all, I thank my parents and my brother for their unconditional love, support, encouragement, and prayers. This career path would never have been an option for me without them. I admit that there were a couple of moments of feeling that this whole process was something beyond what I was capable of. Whenever I felt that way, their emotional support and faith in me made me continue my doctoral life. I especially thank them for taking such a great interest in my academic progress and for always providing me with honest advice. Most of all, my special thanks go to God, who has been working with me under any circumstances and will work for me throughout my whole life.

The people with who I interacted every day are what made my time at R.H. Smith particularly special and enjoyable. I would like to express my appreciation to our Ph.D. Program Coordinator, Justina Blanco and to the AIA department coordinator, Diane Hall. Their professional and personal support is what makes my life in R.H. Smith as smooth as it is. I also thank other accounting Ph.D. students:

Wen-Feng Wang, Sijing Wei, Yue Zheng, Yi Cao, Heedong Kim, Ivy Feng, and Gerald Wald for their sweetness and our time together.

Finally, I would like to thank my co-authors Gil Sadka, Hanna Lee, Michael Kimbrough, Katie Moon, and Seungjoon Oh for their emotional support and for giving me a chance to take part in exciting projects. It is this collection of people who made my five years at the University of Maryland one of the greatest experiences of my life. I thank you all for the part that you played in making that happen.

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Chapter 1: Introduction

Theoretical models predict and empirical evidence demonstrates that investors generally interpret the act of nondisclosure as a negative signal (Grossman and Hart, 1980; Grossman, 1981; Milgrom, 1981; Jovanovic, 1982; Verrecchia, 1983; Dye, 1985; Lanen and Verrecchia, 1987; Jung and Kwon, 1988; Wagenhofer, 1990; Blacconiere and Patten, 1994; Dye and Sridhar, 1995; Leone, Rock, and Willenborg, 2007; Hollander, Pronk, and Roelofsen, 2010). Although investors generally view nondisclosure negatively, theory suggests that this may not always be the case. Specifically, investors may not infer that withheld information is unfavorable if it is proprietary—that is, if it can be exploited to the firm's detriment by outsiders (Verrecchia, 1983; Wagenhofer, 1990; Darrough, 1993; Dye, 2001; Verrecchia, 2001; Graham, Harvey, and Rajgopal, 2005). In contrast to prior empirical work on the implications of nondisclosure (e.g., Hollander, Pronk, and Roelofsen, 2010), this study examines capital market responses to nondisclosure in a setting where there is a credible signaling channel on the proprietary nature of the withheld information. Specifically, I investigate the responses of the market and analysts to firms' application to the Securities and Exchange Commission (SEC) for a confidential treatment order (CTO), which allows firms to redact required disclosures from SEC filings when the redacted information is proprietary. The CTO process entails a vigorous review and verification by the SEC of management's claims that the redacted information is proprietary.

This study fills a void left by prior empirical examinations of the implications of nondisclosure. Prior work shows that the market responds negatively to nondisclosure when managers' implicit claims that the withheld information is proprietary are not verifiable and are, therefore, not credible (e.g., Verrecchia, 1983; Wagenhofer, 1990). However, prior empirical

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research has not explored the possibility that the market may not interpret nondisclosure negatively when it is credible that the withheld information is proprietary. The CTO setting allows me to test this possibility. Hence, this study contributes to a more complete understanding of the implications of nondisclosure.

Theoretical predictions about the implications of nondisclosure stem from investors' adverse selection problem, wherein investors assume the value of withheld information is the most unfavorable and discount the value of the firm to price protect themselves (Akerlof, 1970; Spence, 1973; Grossman and Hart, 1980; Grossman, 1981; Milgrom, 1981). The existence of proprietary costs extends the range of possible interpretations of withheld information to include news that is favorable (Verrecchia, 1983; Wagenhofer, 1990). If investors believe that disclosure of private information would harm the firm's competitive position and damage future firm profitability, they would prefer nondisclosure to full disclosure (Verrecchia, 1983; Wagenhofer, 1990; Darrough, 1993; Dye, 2001; Verrecchia, 2001; Graham, Harvey, and Rajgopal, 2005). However, unless investors can verify the nature of the withheld information, they still discount the value of the firm to some degree because they do not have sufficient basis to determine whether withheld information is good news with proprietary value or bad news.

For this reason, I argue that a credible channel that signals outsiders about the proprietary nature of the withheld information, such as the SEC's CTO approval process, can allow firms to protect proprietary information without being penalized by the market due to adverse selection problems. In fact, I argue that, when there is a credible signaling channel, it is possible that the market may reward nondisclosure of proprietary information–more than not just being penalized. This would be the case if investors interpret a firm's willingness to submit to the SEC's CTO approval process as a credible signal that the firm is in possession of favorable information about

future firm profitability. In this case, investors do not punish and, in fact, reward the firm for nondisclosure because they are convinced as a result of the CTO approval process that full disclosure of the proprietary information would decrease firm value by limiting the firm's ability to profitably exploit its private information. If investors' interpretation is correct, then the act of redaction will be associated with firms' future performance.

I test these predictions using a sample of firms from 2008 to 2013 with CTO redactions and a comparison sample of firms without CTO redactions. First, I test the stock market reaction around the filing dates for Form 8-Ks with CTO redactions. I examine whether CTO redactions are associated with favorable market responses by comparing 8-K with CTO redactions to similar 8-K without CTO redactions. I find that the market reacts favorably to the redaction of required material contract disclosures in 8-K filings after controlling for the topic of the 8-K report, the content of the exhibits, and several firm characteristics. The result is consistent with the market not penalizing the withholding of information through CTO redactions and, in fact, indicates that the market interprets a firm's willingness to undergo the CTO approval process as a favorable signal of the firm's value.

Second, I test analyst forecast revisions around 8-K filing dates. I find that analysts increase their individual EPS forecasts for at least the following two years after the CTO redaction of required material contract disclosures in 8-K filings. This evidence suggests that analysts also infer a favorable signal from the act of redaction.

Lastly, to determine whether analysts' and investors' favorable interpretations of CTO redactions are borne out by future performance, I test whether confidential treatment redactions are associated with long-term performance. I find that CTO firms have higher future industry-adjusted returns on assets (ROA) in the following three years than their non-CTO counterparts.

The results show that redactions are credible signals that the firm is in possession of information with proprietary value that gives a competitive advantage.

Additionally, I test for cross-sectional variations in the implications of nondisclosure across the range of redacted topics. I find that the favorable market and analyst reactions to CTO-redacted portions of 8-K filings are strongest for the redaction of research and development (R&D)-related information, and are weakest or insignificant for the redaction of employee-related information. This result is consistent with investors believing that redacted R&D-related information has greater value for future performance than other types of redacted information and with investors believing that redacted employee-related information has lesser or insignificant value for future performance, although they believe such redacted information is not unfavorable. Consistent with market and analyst reactions, CTO redactions of R&D-related (employee-related) information are associated with more (less) favorable future financial performance than redactions of other types of information.

Although my evidence suggests that a CTO redaction can serve as a credible signal of the nature of undisclosed information, it is possible that the signal is not fully revealing of the economic magnitude of the undisclosed information. If this is the case, there will still be incentives to engage in private information search to refine the signal provided by the CTO redaction. On the other hand, if the signal is fully informative about the economic implications of the undisclosed information, the incentives to engage in further private information search will be minimal. I test these contrasting possibilities by examining changes in analysts' private information search activities surrounding CTO redactions. One of the key roles of analysts is to engage in private information search and discovery (Barth, Kasznik, and Mcnichols, 2001). Given scarce time and resources, analysts focus these efforts where the opportunities to discover

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previously undisclosed information are greatest (Barth, Kasznik, and Mcnichols, 2001).

Therefore, whether and how they adjust their private information search activities in response to

CTO redactions indicates whether or not they think the CTO redaction is fully informative about

the economic implications of the undisclosed information.

I find that more analysts choose to cover a firm following a CTO redaction and that

analyst devote a greater share of their time to covering a firm following a CTO redaction. In

addition, analyst recommendations are more heavily weighted toward "buys" or "sells" than

"holds" in the year of CTO redaction. These findings indicate that analysts engage in more

intense private information search in response to CTO redactions, which suggests that analysts

believe that the signal provided by the CTO redaction is not fully informative.

To mitigate concern that the CTO redaction is a choice variable and that the results are

driven by endogenous differences between firms that file for CTO redactions and those that do

not, I perform all of the above tests using Heckman (1979) self-selection correction methodology

(treatment effect test). All the results hold after controlling for self-selection.

Overall, the results of this paper indicate that the CTO process provides firms with a

credible signaling channel to communicate with outsiders regarding the nature of the withheld

information. Specifically, voluntary nondisclosure through a CTO is not associated with negative

responses and, in fact, is associated with favorable responses. This evidence, combined with

evidence that CTO redactions are positively associated with long-run financial performance,

indicates that CTO redactions are credible signals of the favorable nature of the withheld

information.

This study makes a number of contributions. First, it expands our understanding of the

implications of nondisclosure. While prior empirical work emphasizes the negative implications

of nondisclosure, I document an instance where nondisclosure can be interpreted favorably by the capital market. Second, my study demonstrates that a credible communication channel between insiders and outsiders can be a solution to the dilemma managers face when deciding whether or not to disclose proprietary information. My evidence suggests that the CTO process allows firms to signal the nature of withheld information credibly without revealing the information itself to competitors.

The rest of this paper is organized as follows. Section 2 discusses related literature and provides background information on the confidential treatment process. Section 3 develops empirical hypotheses. Section 4 describes the sample selection procedures. Section 5 specifies the research design. Section 6 provides empirical results, and Section 7 summarizes and concludes.

Chapter 2: Related literature and background information

2.1. Theories of nondisclosure consequences

Because managers' private information is useful for valuation and for performance assessment, scholars have devoted considerable attention to the mechanisms that induce managers to disclose their private information (e.g., Grossman and Hart, 1980; Grossman, 1981; Milgrom, 1981). The primary theorized mechanism for inducing managers to disclose is investors' expected negative response to the act of nondisclosure. Viewed through the prism of Akerlof's (1970) market for lemons and adverse selection, investors assume that the withheld information is the most unfavorable and discount their valuation of a non-disclosing firm accordingly. Prior empirical work is consistent with the predicted negative response to the act of nondisclosure. Specifically, Hollander, Pronk, and Roelofsen (2010) document that investors respond negatively when managers refuse to provide requested information during conference calls.

While prior theoretical models predict and empirical evidence demonstrates that investors generally interpret the act of nondisclosure negatively, subsequent theories suggest that this may not always be the case. Specifically, while early theories posit that the adverse selection penalty investors impose on non-disclosing firms is sufficient to induce full disclosure, subsequent theoretical papers seek to explain why full disclosure is not observed empirically. This work focuses on factors that cloud investors' ability to interpret nondisclosure unambiguously. These factors include uncertainty about managers' information endowment and the existence of disclosure costs (Jovanovic, 1982; Verrecchia, 1983; Dye, 1985; Lanen and Verrecchia, 1987; Jung and Kwon, 1988; Wagenhofer, 1990; Dye and Sridhar, 1995). If it is not clear whether

managers are endowed with private information, then investors do not know whether nondisclosure of private information is due to its nonexistence or to its adverse content. Similarly, if disclosure entails costs, then investors do not know whether nondisclosure of private information is due to disclosure costs or to the adverse content of the withheld information. In both cases, uncertainty about the reason for nondisclosure mitigates investors' concerns about adverse selection and, therefore, weakens the penalties they impose on firms for nondisclosure.

Proprietary cost is arguably the most compelling disclosure cost (Verrecchia, 1983, 2001). Many prior studies suggest that firms' decisions to disclose information to investors is influenced by concern that such disclosures can damage their competitive position in product markets (Verrecchia, 1983; Darrough and Stoughton, 1990; Wagenhofer, 1990; Feltham and Xie, 1992; Newman and Sansing, 1993; Darrough, 1993; Gigler, 1994; Graham, Harvey, and Rajgopal, 2005). These studies conclude that firms have an incentive not to disclose information that would harm their competitive position, even if that nondisclosure entails some penalty for the firm. On the other hand, investors should not impose an adverse selection penalty on firms where the reason for nondisclosure is proprietary costs rather than the existence of adverse private information. Of course, investors face the problem of determining the true reason for nondisclosure.

Based on the foregoing discussion, I argue that the adverse selection penalty normally imposed on non-disclosing firms should be mitigated when there is credible evidence that the reason for nondisclosure is proprietary costs. I argue that the SEC's CTO process provides a means for the firm to signal to investors the proprietary nature of withheld information. If the signal provided by managers' willingness to undergo the CTO is credible, then it resolves uncertainty about the reason for nondisclosure, which mitigates the adverse selection penalty.

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Moreover, I argue that it can also serve as a signal regarding the existence of favorable private proprietary information, which can lead investors to revise upward their assessment of firm value even without knowing the content of the withheld information. In sections 2.2 and 2.3, I provide more detailed support for this possibility, including a brief analytical discussion. Therefore, I broaden Hollander, Pronk, and Roelofsen's (2010) examination of the implications of nondisclosure to the confidential treatment setting, where there is a credible signal supported by further external verification of the proprietary nature of the undisclosed information.

2.2.   Confidential treatment request as a signaling mechanism

In contract theory, signaling is the idea that one party credibly conveys some information about itself to another party. The theory is based on asymmetric information between the two parties. Spence's job-market signaling model (Spence, 1973, 1974) shows that potential employees send a signal about their ability level to the employer by acquiring certain educational credentials. Signals may be acquired by sustaining signaling costs, and the cost of obtaining the signal must be lower for high-productivity workers. Otherwise, the signal loses its informative value in discriminating between different types of workers.

The prediction from the market signaling model (Spence, 1973, 1974) is applicable to the CTO setting in this paper. Requests for confidential treatment of certain information in the SEC filing can be a credible signal about the proprietary nature of the information withheld because, as discussed in section 2.4, such requests are subjected to rigorous review by the SEC. Requesting confidential treatment is more costly to dishonest filers who aim to hide unfavorable information or to make a false signal of possessing proprietary information than to filers who have genuine motives of protecting proprietary information from the competitors. First, filers

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who seek CTO treatment without legitimate reasons face a reputation cost. If the SEC denies a CTO after a review, there is a public filing in the EDGAR announcing that the request was denied with the reason for the denial and sometimes followed by a news article about the denial. In addition, although firms can initially redact information in their original filings pending SEC approval, they must disclose the redacted information when the request is denied. Second, the cost of preparing a CTO application is higher for false filers. Filing firms need to submit legal and factual analysis justifying the eligibility of redaction with supporting documents. If a firm does not have a valid reason satisfying the requirements for confidential treatment, the firm will not be able to prepare persuasive explanation and analysis for the application without fabrication, which is a crime. Because the CTO process will be costly for firms that do not have legitimate reasons to seek confidential treatment, a firm's willingness to undergo the CTO process can serve as a credible signal that the firm is not hiding unfavorable information.

Beyond simply indicating that the firm is not hiding unfavorable information, the signal can inform outsiders that the firm is in possession of proprietary information associated with positive future potential. In this case, signaling becomes a substitute for disclosure, undertaken to convey information about the possession of proprietary information that may affect firms' earnings' generating power without revealing the information itself. The next section provides a brief analytical discussion that illustrates this possibility.

2.3.   Analytical discussions of disclosure/nondisclosure consequence

In this section, I use an analytical discussion to explain how nondisclosure through the CTO process can actually serve as a favorable signal. Let O be some proprietary information. O is valuable in terms of firm value because it is information/strategy/technology that can generate

future cash flow to the firm. The present value of O is $B = \sum_t \frac{\Delta CF_t}{(1+r)^t}$, where ΔCF_t is the

incremental future cash flow generated by O at time t, and r is a discount rate which is associated

with the cost of capital of a firm. A larger B means O has more cash flow generating power, and

thus a larger proprietary value. $B > 0$ arises due to the possession of certain proprietary

information, and the disclosure of O may harm its exclusivity and reduce cash flow. Assuming

that the benchmark price of the firm without O is zero, the price of the firm before the CTO

event can be expressed as $P_0 = \alpha B$, where $0 \leq \alpha \leq 1$ and α represents the prior belief of the

market in the existence of such proprietary information.

If O is disclosed without redaction, two things will occur, First, the market learns that the

firm possesses the proprietary information, so α is now updated to $\alpha^d > \alpha$. Second, the benefit

of the proprietary information is now harmed because the information O has been disclosed. Let

cB be the proprietary cost associated with the disclosure with $c > 0$. This is the amount of the

firm value that is lost when the information is disclosed. Given these two effects of the

disclosure, the price after the disclosure is $P_1^d = (\alpha^d - c)B$ and the price change is

$\Delta P^d = P_1^d - P_0 = (\alpha^d - \alpha - c)B$. $(\alpha^d - \alpha)$ represents the degree of surprise from the

disclosure, which is non-negative. The sign of the price change ΔP^d depends on the relative

magnitude of α^d, α, and c.

If the market sees a redaction with a CTO and if the market considers the CTO as a

credible indication of the existence of proprietary information, the price of the firm increases to

$P_1^{cto} = \alpha^{cto} B$, where $\alpha^{cto} > \alpha$. This means that the market changes its belief in the possession

of the proprietary information O to its surprise. Thus, the price reaction is positive; i.e.,

$\Delta P^{cto} = P_1^{cto} - P_0 = (\alpha^{cto} - \alpha)B > 0$. The positive reaction from the market means the market

revises upward the assessment of a firm value, and this is the main argument of this paper. I use the CTO setting to test this possibility.

When O is not disclosed without a CTO, the market does not have a clue as to the nature of the information undisclosed. I assume that the market receives the signal of the nondisclosure. Then, the market will incorporate the possibility that the redacted O is not about proprietary information into the price. The price of the firm decreases to $P_1^{nd} = \alpha^{nd} B$, where $\alpha^{nd} < \alpha$. Thus, the price reaction is negative; i.e., $\Delta P^{nd} = P_1^{nd} - P_0 = (\alpha^{nd} - \alpha) B < 0$.

2.4. Background information on confidential treatment orders

The federal securities laws require companies that have reporting requirement to the SEC to disclose a broad range of financial and non-financial information in their SEC filings (10-K, 10-Q, 8-K, etc.). Sometimes disclosure of information required by the regulations can adversely affect a company's business and financial condition because of the competitive harm that can result from the disclosure. To address this potential disclosure hardship, the SEC allows companies to request confidential treatment of information filed under the Securities Act and the Exchange Act. A confidential treatment order allows information in the SEC filing to be kept secret from the public for a certain period of time. Most applicants for a CTO rely on the Freedom of Information Act (FOIA) exemption that covers "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (SEC, 2001). Examples of information for which companies seek confidential treatment include names of contracting parties, contracting amounts, pricing arrangements made with partners, technical specifications, and milestone payments.

To apply for confidential treatment, a firm files a redacted version of the mandatory filing in the SEC EDGAR database and indicates that portions of the filing have been redacted pursuant to a request for confidential treatment. Redacted confidential portions must be clearly and adequately marked. The firm should provide a complete un-redacted copy of the document to the SEC with an analysis of the request for confidential treatment at the same time. The analysis must justify the eligibility of the information for confidential treatment under the FOIA, the competitive harm that would result from full disclosure and the immateriality of the disclosures to investors.[1] Although the redacted information itself should be immaterial to investors, the fact that the redacted information is important to competitors can be informative to investors as to the firm's competitive advantage and future potential. In addition, the firm must specify the date until which the information is to remain confidential[2], the rationale for the confidential period, and consent to the release of confidential information for official purposes. An applicant requesting the extension of a previously granted order should submit the application before the expiration date of the earlier order.

The SEC expects to respond to confidential treatment requests within 28 days of receipt, either by granting a confidential treatment order or by sending a comment letter to the firm (SEC, 2001). Firms must respond to comment letters within 21 days (SEC, 2001). Final resolution of the comment letter is approval, approval with more limited or modified redaction

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[1] Requirements for granting confidential treatment are the following: Information redacted should not be publicly available elsewhere such as in press releases, news articles, or disclosures (or intention to disclose) from another party to the agreement. Information required or/and material cannot be granted even if it is confidential - the identity of a 10% customer, the dollar amount of firm backlog orders, interest expenses and other similar terms in a material credit agreement, the duration and effect of all patents, trademarks, licenses, franchises and concessions held, required disclosure in the Management's Discussion and Analysis of Financial Condition and Results of Operations section relating for instance to loan arrangements and installment payment obligations on debt, and disclosure about related party transactions (SEC, 2001).

[2] Expiration dates and thus duration of the redaction can be different for each exhibit in the same CTO form. The maximum duration of keeping the information confidential is 10 years, but extension of the order is available.

(partial approval), or denial. In any case, the SEC will issue Form "CT Order" which contains the result of the review in the EDGAR database. See Appendix A for an example of the Form "CT Order". If the request is denied or approved with limited or modified redaction, firms should file an amendment form of the original filing reflecting the comments from the SEC.

The SEC ultimately approves nearly all confidential treatment requests (>99.9%).[3] This high approval rate raises the concern that CTO approvals are merely rubber stamps that do not entail a rigorous review. If this were the case, then a CTO would not be a credible indicator that the redacted information is proprietary, as opposed to simply unfavorable. I offer several observations that mitigate this concern. First, the SEC requires applicants to submit analyses that justify the eligibility of the information for nondisclosure. The application should avoid conclusory statements and must include a sufficient legal analysis, including case law references. The application also should include a factual analysis of the basis for the exemption requested with respect to the specific information that is the subject of the request. Second, more than 10% of CTO requests must be amended from the original requests (Thompson, 2011). Although the percentage of CTO applications that are not approved in the first round (i.e., that receive comment letters) is not publicly available, the fact that more than 10% of them are modified suggests that 10% is a lower bound. Moreover, the average duration of time for approval is 1.4 months (Thompson, 2011), which, along with the fact that the SEC is supposed to respond to the application within 28 days, indicates that the review process is not nominal. Third, the audit

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[3] Only 9 out of 8,389 confidential treatment requests are denied in my sample. See Appendix B for an example of a denied CTO. The most frequent reasons for rejecting confidential treatment requests are a lack of information to justify the exemption from disclosure, the failure to adequately demonstrate the substantial likelihood of competitive harm from full disclosure, and the redacted information is material to those who make investment decisions, although the sample size is very small (N = 9). More than one reason for denial can be applied to a single application.

report of confidential treatment processes and procedures (SEC, 2010) shows that all CTO applications go thorough inspection by research specialists based on industry clusters, and more than 30% of them are subject to further review and examination. Lastly, the untabulated results show that the overall percentage of firms that request CTO has been low (around 2.5%) and stable over the sample period, indicating that only a small number of firms that have proprietary information apply for a CTO. Thus, the high approval rate of the CTO requests indicates that only firms that are confident in their ability to withstand costly SEC scrutiny apply for CTO approval.

Once the confidential treatment order is expired, the information previously redacted becomes available to the public. However, previous filings with redacted information are not updated with un-redaction, and un-redacted full disclosure is only available through a request to the SEC's FOIA department. An example of an un-redacted version of an expired confidential treatment filing is provided in Appendix C.

The main independent variable I use throughout the paper is whether a firm redacts certain information by *applying* for confidential treatment. This variable does not capture the actual grant of the CTO. What investors observe with the filing of SEC forms such as 8-K, 10-K, 10-Q, and etc. is the redacted portion in the filings with the explanation of the CTO request – "*Confidential treatment has been requested for portions of this exhibit. The copy filed herewith omits the information subject to the confidentiality request. Omissions are designated as ***.*", not the actual approval from the SEC. Thus, what I examine is the market and analyst reactions to the request of the CTO, not to actual SEC approval. As discussed above, I argue that a firm's willingness to submit to the CTO approval process can be a credible signal of the proprietary nature of the undisclosed information.

2.5.   Prior studies on confidential treatment orders

Several prior studies examine the impact of CTOs on information asymmetry. Verrecchia and Weber (2006) show that CTO nondisclosure is associated with increased information asymmetry, as reflected in higher bid-ask spreads, lower market depth, and lower share turnover. Boone, Floros, and Johnson (2016) show that redacting IPO firms experience greater underpricing, which is commonly attributed to information asymmetry. While these studies show that the redaction decision increases information asymmetry by explicitly acknowledging the existence of undisclosed private information, it is also possible that redaction has the separate impact of communicating a credible (albeit imprecise) signal that leads to revisions in expected future cash flow. Therefore, in contrast to studies that focus on information asymmetry, I examine whether the redaction decision leads to revisions in consensus market and analyst expectations of future cash flow. As discussed in section 2.1, nondisclosure is generally expected to convey a negative signal. However, in this study I explore the possibility that nondisclosure through a credible signaling channel like the CTO process can convey a positive signal. Prior studies that focus only on information asymmetry do not provide insight into this question.

Two prior studies examine the information content of redacted disclosures about investment trades. Cao (2011) shows that significant returns could have been earned on portfolios based on previously redacted information about investment holdings. Similarly, Agarwal, Jiang, Trang, and Yang (2010) show that the equity holdings of hedge funds that are covered by CTOs exhibit superior performance over the period for which they seek confidentiality. These studies show that, in the financial sector, firms that apply for confidential treatment of their holdings do appear to hide valuable information about superior trading strategies. I extend examination of the information content of redacted information to industrial

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firms to determine whether CTO redactions by industrial firms also pertain to favorable information, on average. Boone, Floros, and Johnson (2016) also examine the information content of CTO redactions for industrial firms, but their examination is limited to IPO firms, while I examine already public firms in the normal course of business. In addition, while prior studies do not examine the capital market's reaction to CTO redactions, I examine the previously unexplored question of whether the market and analysts infer a favorable signal from CTO redactions.

Chapter 3: Hypotheses development

As described in section 2.1, investors will generally impose an adverse selection penalty on firms that withhold private information. An exception to this expectation is if disclosure of the private information entails proprietary costs. In this case, investors cannot unambiguously infer that the withheld information is the most unfavorable and, therefore, lower the adverse selection penalty they levy on non-disclosing firms. Moreover, the existence of proprietary costs can serve as a positive indication that the firm is in possession of favorable information that may affect future firm performance. These possibilities require credible verification that the undisclosed information is vulnerable to proprietary costs. I argue that the SEC's CTO process described in section 2.2 and 2.4 provides such verification and makes a CTO request a credible signal. If the external verification associated with the CTO process minimizes adverse selection concerns and serves as a credible indicator of the favorable nature of the redacted information, then investors should respond favorably to the CTO redactions in the SEC filings as modeled in section 2.3. Thus, my first hypothesis is as follows:

H1: The market reacts favorably to the CTO redaction in SEC filings at the time of the release of the filing.

If CTO redactions are credible indicators of the favorable nature of withheld information, then analysts should incorporate this favorable information in their earnings forecasts. Thus, my second hypothesis is as follows:

H2: Analysts revise their EPS forecasts favorably following the CTO redaction in SEC filings at the time of the release of the filing.

The preceding hypotheses relate to how capital market participants interpret the act of CTO redaction based on the assumption that CTO redactions are credible indicators of the nature of withheld information. If the act of CTO redaction is indeed driven by the existence of favorable proprietary information, then CTO redactions should be positively associated with future financial performance. Thus, my third hypothesis is as follows:

H3: CTO firms have better future financial performance than their non-CTO peers.

The preceding hypotheses examine the average signaling impact of CTO redactions. It is possible that the signaling impact of CTO redactions varies by the type of information redacted. I argue that the degree to which a CTO redaction is interpreted as a signal of good news depends on the perceived relevance of the redacted information to firm value - *B* from the model in section 2.3 and the credibility of managers' claims that the redacted information has proprietary value (Sobel, 1985; Jennings, 1987, Brudney, 1989; Gu and Li, 2007), which is associated with the surprise part of the redaction signal $(\alpha^{cto} - \alpha)$ from the model in section 2.3.

Although the CTO redaction itself can be informative about both items, I argue that investors can refine their assessments based on the topic and contextual details surrounding the redacted passages. For example, Baiman and Rajan (2002) theoretically show that firms with superior business processes are more likely to keep supplier contract information confidential. By extension, I argue that the decision to redact information about third-party contracts that are related to a firm's main business is more likely than other types of redactions to be motivated by a desire to safeguard potential future impact on profit, which means the potential future impact of the redacted information is larger. Hence, redactions related to third-party contracts are more likely to be favorable indicators of firms' internal processes that affect future profitability, and it is likely to be more credible that such redactions are driven by proprietary motives. Among the

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main business-related contracts with third parties, contracts regarding research are more likely to be perceived favorably because they are more likely to contain technical details of internal process that affect firm potential. Firms tend to withhold names of contracting parties, specific research subjects, or contract timelines in research-related CTOs. Based on the foregoing, I propose the following hypotheses, which collectively predict that the signaling impact of CTO redactions is more pronounced for redactions of third-party contracts, especially for research-related contracts.

H4: The market reacts more favorably to the CTO redactions when the redacted information pertains to third- party contracts, more so for research-related contracts than for other types of redacted information.

H5: Analysts revise their EPS forecasts more favorably following CTO redactions when the redacted information pertains to third-party contracts, more so for research-related contracts than for other types of redacted information.

H6: The extent to which CTO firms have better future financial performance than their non-CTO peers is greater for CTO firms that redact information related to third-party contracts, more so for research-related contracts than for other types of redacted information.

The foregoing discussion indicates that a CTO redaction can serve as a credible signal of the nature of undisclosed information. However, even if the CTO redaction serves as a credible signal, it may not be fully revealing of the economic magnitude of the undisclosed information. If this is the case, there will still be incentives to engage in private information search to refine the signal provided by the CTO redaction. On the other hand, if the signal is fully informative about the economic implications of the undisclosed information, the incentives to engage in further private information search will be minimal. I test these contrasting possibilities by

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examining changes in analysts' private information search activities surrounding CTO redactions. One of the key roles of analysts is to engage in private information search and discovery (Barth, Kasznik, and Mcnichols, 2001). Given scarce time and resources, analysts focus these efforts where the opportunities to discover previously undisclosed information are greatest (Barth, Kasznik, and Mcnichols, 2001). Therefore, whether and how they adjust their private information search activities in response to CTO redactions indicate whether or not they think the signal provided by the CTO redaction is fully informative about the economic implications of the undisclosed information.

Following Barth, Kasznik and McNichols (2001), I use analysts' coverage and effort decisions as indicators of their private information search activities. The opportunities to uncover undisclosed private information and the value of such information are likely to be greater for firms with less informative prices (Barth, Kasznik, and Mcnichols, 2001). If the market's response to CTO redactions reflects the general nature of the undisclosed information but not its precise economic impact then the post-CTO redaction price is likely to be less informative. In this case, analysts have increased incentives to cover and expend more effort on firms with CTO redacted information. Thus, I propose the following hypotheses.

H7: Analyst coverage increases following the CTO redaction.

H8: Analyst effort increases following the CTO redaction.

I also argue that analysts' recommendations reflect the result of their private information search activities. Analysts recommend "buy" or "sell" when they believe the current market price does not fully reflect all relevant information. If their private information search uncovers information not already conveyed by the CTO redaction signal then they will be more willing to

issue either "buy" or "sell" rather than "hold" recommendations. Therefore, I test the following hypothesis.

H9: The proportion of stock recommendations that are "buys" or "sells" increases following the CTO redaction.

Chapter 4: Sample selection and descriptive statistics

4.1.   Data and sample selection

Beginning May 1, 2008, the SEC started posting Form "CT Order" in EDGAR to disclose the results of CTO reviews. Therefore, I first collect all Form "CT Order"s in the SEC EDGAR database that were issued on or after May 1, 2008 through Dec. 31, 2013.[4] I retain CTOs with initial filing dates on or after Jan. 1, 2008.

I use regular expression with PERL to extract data from each Form "CT Order". Specifically, I collect the firm name, the date of the grant, and the SEC filing form type to which the CTO applies (e.g. 10-K, 10-Q, or 8-K), as well as the exhibit numbers covered by the CTO, the initial filing date of the SEC filing, whether the CTO request is new or an extension of a prior order, whether the CTO request has been amended from the initial request, and the expiration date of the order.

Next, I collect all Form 10-Ks, 10-Qs, and 8-Ks from the SEC EDGAR database for filing years from 2008 to 2013.[5] For each form, I collect identifying information such as firm name, CIK, form type, filing date, and the SIC. For each exhibit, I collect the exhibit number, which represents the broad topic of the exhibit as well as the title and the description. For Form 8-Ks, I additionally collect the category of events that the current report is describing.[6] The SEC has instructions that describe the types of events that trigger a public company's obligation to file an 8-K. See Appendix D for details.

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[4] Before May 1, 2008, there was no separate document in the EDGAR representing a confidential treatment order, and only marked confidential portions in the mandatory filings show the application of confidential treatment requests.

[5] More than 85% of CTOs relate to information from Form 10-Ks, 10-Qs, and 8-Ks. I therefore focus on these forms, as they are the most important and most frequently used.

[6] I use regular expression with PERL to extract data from each form.

I use the extracted exhibit numbers, titles, and descriptions of the exhibits to categorize the exhibits. Because more than 80% of the CTOs relate to material contracts, I first classify the exhibits into the following categories based on the contracting party described in the exhibits: employees (including executives), shareholders (including ownership-related issues), and third parties (outsiders including arm's-length transactions). I further classify third-party exhibits into the following categories based on the contracting topic: financing (including debt), R&D, and other regular business (such as purchase or sales). I use these classifications to test for cross-sectional variation in the effect of CTOs based on the type of information redacted. To control for the contents of the exhibits, I use a narrower 10-category classification.[7]

Then, I match all 10-K, 10-Q, and 8-K filing forms with CTO information using CIK, filing form, filing date, and exhibit number. All SEC filings that are matched with a corresponding CTO are included in the CTO sample. All unmatched SEC filings with at least one exhibit are included in the comparison sample.

I use several firm- and industry-related control variables in the analyses. Databases associated with the controls include COMPUSTAT, CRSP, IBES, and SDC Platinum. For details of the variables, see Appendix E.

4.2.   Descriptive statistics on confidential treatment orders

Table 1 provides descriptive statistics for CTOs and the corresponding SEC filings. The number of CTOs granted each year does not fluctuate much over the sample period. The sample starts from May 1, 2008, and this explains the relatively small number of CTOs in 2008. Denied

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[7] Customer and Supplier, Debt and Financing, Employee, Lease, License and Royalty, Ownership, Peer, Research and Patent, Restructuring, and Shareholder.

CTO requests are very rare, although the initial approval rate before modification in response to SEC comments is 89% (Thompson, 2011). The average number of exhibits covered by a single CTO is 1.6. The average length of a CTO is 5 years, which is consistent over the sample period. Around 85% of CTOs are from Forms 10-K, 10-Q, and 8-K. About 1% (2%, 3% respectively) of 8-Ks (10-Qs, 10-Ks respectively) have redacted information by CTO, and the total number of firms that have at least one CTO for the entire sample period is 2,442.

Table 2 lists the twelve most represented 2-digit SIC industries with CTOs. Consistent with the claim that CTOs are granted to protect proprietary information, the most common industry category receiving CTOs is manufacturing, especially high-tech manufacturing including pharmaceutical (chemicals). Manufacturing industry comprises around 45% of all CTO filing forms, followed by Services, Transportation & Public Utilities, Finance, Insurance, Real Estate, and Mining. Although I tabulate a 2-digit SIC industry classification and a broader 10-category classification for presentation purposes, I use a 3-digit SIC industry classification for better comparisons of firms with and without CTOs in the analyses.

Table 3 provides information content for the material contract exhibits in the 8-Ks. For tests of H1/H4 and H2/H5, which examine market and analyst reactions to CTO redactions, I limit my sample to 8-Ks related to material contracts. I classify all material contract exhibit contents into the following five categories - Purchase or Sales, Research, Debt or Financing, Employee, and Shareholder or Ownership. If a single 8-K has more than two material contract exhibits and the exhibits fall into different categories, a multiple count is possible. Purchase- or Sales-related contracts are the most common content for 8-Ks with CTOs, but Employee-related contracts are the most common for non-CTO 8-Ks. The percentage of exhibits that redact by CTO is highest for Research-related exhibits, and exhibits that contain Purchase- or Sales-related

contents follow. Employee-related exhibits show the lowest percentage of redaction. The result is consistent with the belief that Research- (Employee-) related exhibits are more (less) likely to contain proprietary information and have a CTO. The percentage of firms that have a CTO ranges from almost 0% to 5%, and it is consistent with the claim that only a small portion of firms that actually have proprietary information request confidential treatment.

Chapter 5: Research design

5.1. Determinants of CTO redaction

Before testing my hypotheses, I examine the determinants of confidential treatment requests. I assume that firms' decisions to redact information using a CTO can be predicted by firm and industry specific variables – *size*, performance (*ROA* and *Loss*), financing (*Debt* and *Equity* issuance), industry competition (*Herfindahl index*), growth potential (*book-to-market ratio* and *sales growth*), *R&D expenses* and *intangible assets*, and *firm age*. Some variables are from the similar regression in Verrecchia and Weber (2006). The unit of analysis is a firm-year because it corresponds to the periodic availability of accounting variables. This analysis is associated with the first-stage regression in the Heckman (1979) self-selection correction methodology used to test my hypotheses. Specifically, I estimate the following Probit regression:

$$CTO\_dum\_fy = \alpha + \beta_1 \, Size + \beta_2 \, ROA + \beta_3 \, Loss + \beta_4 \, Debt + \beta_5 \, Equity + \beta_6 \, HIndex + \beta_7 \, BtoM + \beta_8 \, Sales\_Gr + \beta_9 \, R\&D + \beta_{10} \, Intangible + \beta_{11} \, Age + \sum_k \zeta_k \, Ind\_dum_k + \sum_l \eta_l \, Year\_dum_l + \varepsilon \tag{1}$$

See Appendix E for variable definitions. Because CTO is a choice variable, the results from the ensuing hypothesis tests using the CTO indicator as a main independent variable may suffer from endogeneity problems. I address endogeneity concerns using the Heckman (1979) self-selection correction methodology (treatment effect test) to control for the endogenous difference between firms that decide to redact and those that do not by adding the inverse mills ratio into the second-stage regression. In the first stage Probit regression, I estimate expanded versions of equation (1) that also include all variables used in the regressions used to test the various hypotheses. Variables not included in the second stage regressions serve as instruments, which satisfy exclusion restriction. I expect that *Debt, Equity, HIndex, R&D, Intangible,* and *Age*

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are exogenously associated with a firm's choice to request a CTO, but have no theorized effect on abnormal returns around CTO redactions. The second-stage regressions for the various hypotheses additionally include the inverse mills ratio, which is estimated from the first-stage Probit estimation and corrects for endogeneity. I check the validity of instrument variables in the first stage using overidentifying restriction tests.[8]

5.2.   Market reaction to CTO redactions (H1)

The first hypothesis focuses on the market's interpretation of CTO redactions. To test this hypothesis, I limit my sample to Form 8-Ks related to material contracts. Form 8-K is the "current report" companies must file with the SEC to announce major events that shareholders should know about within four days of the event (SEC, 2012). The report announces a specific event, and it is relatively straightforward to control for information content in the filing form using reporting items disclosed in the 8-K.[9] Based on findings by Carter and Soo (1999) and Lerman and Livnat (2010) that the market reacts to the information disclosed in 8-Ks, I test H1 using short window tests of stock market reactions around 8-K filings with and without CTO redactions. Specifically, I estimate the following regression:

$$\text{3-day excess ret (CAR)} = \alpha + \beta_1 \, CTO\_dum + \beta_2 \, Size + \beta_3 \, BtoM + \beta_4 \, RET\_P + \sum_i \gamma_i \, Item\_dum_i + \sum_j \delta_j \, Content\_dum_j + \sum_k \zeta_k \, Ind\_dum_k + \sum_l \eta_l \, Year\_dum_l + \varepsilon \qquad (2)$$

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[8] The overidentifying restriction test static is obtained by a regression of the second-stage residuals on all exogenous variables. If the instruments are valid, the coefficients on the instruments should be close to zero. The formal test is based on R^2 from this model being close to zero (Larcker and Rusticus, 2010).

[9] By contrast, annual reports on Form 10-K and quarterly reports on Form 10-Q contain a massive amount of information on various events over the period that the report covers, much of which might have been announced or released previously. Thus, isolating the market's response to CTO redactions in 10-K or 10-Q filings is daunting. For details of the reporting item classification in the 8-K, see Appendix D.

See Appendix E for variable definitions. The coefficient on *CTO_dum* (β_1) provides a test of H1. It represents the incremental market response to CTO redactions. If the market interprets CTO redactions as a favorable signal, then I expect β_1 to be significantly positive. I control for the topic of 8-Ks (*Item_dum$_i$*) and the content of exhibits (*Content_ dum$_j$*) as well as the 3-digit SIC industry and the year. I additionally control variables that potentially affect 3-day excess return - firm size, book-to-market ratio capturing firm potential, and past 6-month return capturing stock price momentum because the momentum returns may drive the market price up to unreasonable levels. To correct for endogeneity from the choice of applying for a CTO, I estimate a variant of equation (2) that includes the inverse mills ratio, which takes into account a possible selection bias, as an additional explanatory variable as discussed in section 5.1. The overidentifying restriction test supports the appropriateness of the instruments.

5.3.   Analyst reaction to CTO redactions (H2)

The second hypothesis focuses on analysts' interpretation of CTO redactions. As with H1, I limit my sample to Form 8-Ks related to material contracts. Among different measures of analyst forecasts, I focus on individual annual EPS forecasts for the next three years after the redaction to test whether CTO-redacted information is associated with a change in analyst forecasts. I also test change in individual annual EPS forecasts for the next one, two, and three years separately. I test H2 using the following regression:

Change in EPS forecast = α + β_1 CTO_dum + β_2 Size + β_3 BtoM + β_4 N_Analysts + β_5 Dispersion + $\sum_i \gamma_i$ Item_dum$_i$ + $\sum_j \delta_j$ Content_dum$_j$ + $\sum_k \zeta_k$ Ind_dum$_k$ + ε (3)

See Appendix E for variable definitions. The coefficient on *CTO_dum* (β_1) provides a test of H2. It represents the incremental analyst response to CTO redactions. If analysts interpret

CTO redactions as a favorable signal (as predicted by H2), then I expect β_1 to be significantly positive. I control for the topic of 8-Ks and the content of exhibits as well as the 3-digit SIC industry. In addition, I include control variables that potentially affect EPS forecast revision - firm size, book-to-market ratio, number of analysts following capturing the disclosure quality overall, and EPS forecast dispersion proxying for information asymmetry and uncertainty. To correct for endogeneity from the choice of applying for CTO, I estimate a variant of equations (3) that includes the inverse mills ratio, which takes into account a possible selection bias, as an additional explanatory variable as discussed in section 5.1. The overidentifying restriction test supports the appropriateness of the instruments.

To mitigate concerns about outliers, I additionally test H2 using the following Probit model that examines the likelihood that analysts revise their individual EPS forecasts upward in response to CTO redactions in 8-Ks.

$$\text{Signed change in EPS forecast} = \alpha + \beta_1\ \text{CTO\_dum} + \beta_2\ \text{Size} + \beta_3\ \text{BtoM} + \beta_4\ \text{N\_Analysts} + \beta_5\ \text{Dispersion} + \sum_i \gamma_i\ \text{Item\_dum}_i + \sum_j \delta_j\ \text{Content\_dum}_j + \sum_k \zeta_k\ \text{Ind\_dum}_k + \varepsilon \qquad (4)$$

See Appendix E for variable definitions. A finding that β_1 is positive in equation (4) would provide additional support for H2.[10]

5.4.   CTO redactions and long-term performance (H3)

My third hypothesis focuses on the association between CTO redactions and future performance. In contrast to the tests of H1 and H2, the sample to test H3 includes 10-Ks and 10-Qs in addition to 8-Ks because H3 does not require a strict definition of when information arrives

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[10] Including the inverse mills ratio as a correction for self-selection in a Probit model is not appropriate.

in the market.[11] In addition, the unit of analysis to test H3 is the firm-year because it corresponds

to the periodic availability of accounting variables. I test H3 using the following regression:

$$\text{ROA\_adjusted} = \alpha + \beta_1\,\text{CTO\_dum\_fy} + \beta_2\,\text{Size} + \beta_3\,\text{BtoM} + \beta_4\,\text{ROA\_adjusted (Year} = -1) + \sum_j \delta_j\,\text{Content\_dum}_j + \sum_l \eta_l\,\text{Year\_dum}_l + \varepsilon \qquad (5)$$

See Appendix E for variable definitions. Industry-adjusted ROA captures the overall

performance of the firm. The coefficient on *CTO_dum_fy* (β_1) provides a test of H3, reflecting

the extent to which CTO redactions are associated with future performance. If CTO redactions

are credible indicators that the redacting firm is withholding favorable information (as predicted

by H3) then I expect β_1 to be significantly positive. I control variables that potentially affect firm

performance - firm size, book-to-market ratio, industry-adjusted ROA of the year before the

CTO to control for previous performance, and the year. To correct for endogeneity from the

choice of applying for CTO, I estimate a variant of equation (5) that includes the inverse mills

ratio, which takes into account a possible selection bias, as an additional explanatory variable as

discussed in section 5.1. The overidentifying restriction test supports the appropriateness of the

instruments.

5.5.   Differential impact of CTO redactions based on topic (H4 through H6)

H4 through H6 predict that the signaling impact of CTO redactions will vary by the type

of information redacted. To test these hypotheses, I estimate the following variants of equations

(2) through (5) that incorporate interactions of the CTO indicator variable with indicator

variables for the type of information redacted.

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[11] I also test H3 using firms with 8-Ks (not considering 10-Ks and 10-Qs) similar to H1 and H2. The results are not different from the main test reported.

3-day excess ret (CAR) = α + β_1 CTO_dum + β_2 Size + β_3 BtoM + β_4 RET_P + $\sum_i \gamma_i$ Item_dum$_i$ + $\sum_j \delta_j$ Content_dum$_j$ + $\sum_k \zeta_k$ Ind_dum$_k$ + $\sum_l \theta_l$ Year_dum$_l$ + η_1 CTO_dum*Purchase or Sale + η_2 CTO_dum*Research + η_3 CTO_dum*Debt or Financing + η_4 CTO_dum*Employee + η_5 CTO_dum*Shareholder or Ownership + κ_1 Purchase or Sale + κ_2 Research + κ_3 Debt or Financing + κ_4 Employee + κ_5 Shareholder or Ownership + ε (2')

Change in EPS forecast = α + β_1 CTO_dum + β_2 Size + β_3 BtoM + β_4 N_Analysts + β_5 Dispersion + $\sum_i \gamma_i$ Item_dum$_i$ + $\sum_j \delta_j$ Content_dum$_j$ + $\sum_k \zeta_k$ Ind_dum$_k$ + η_1 CTO_dum*Purchase or Sale + η_2 CTO_dum*Research + η_3 CTO_dum*Debt or Financing + η_4 CTO_dum*Employee + η_5 CTO_dum*Shareholder or Ownership + κ_1 Purchase or Sale + κ_2 Research + κ_3 Debt or Financing + κ_4 Employee + κ_5 Shareholder or Ownership + ε (3')

Signed change in EPS forecast = α + β_1 CTO_dum + β_2 Size + β_3 BtoM + β_4 N_Analysts + β_5 Dispersion + $\sum_i \gamma_i$ Item_dum$_i$ + $\sum_j \delta_j$ Content_dum$_j$ + $\sum_k \zeta_k$ Ind_dum$_k$ + η_1 CTO_dum*Purchase or Sale + η_2 CTO_dum*Research + η_3 CTO_dum*Debt or Financing + η_4 CTO_dum*Employee + η_5 CTO_dum*Shareholder or Ownership + κ_1 Purchase or Sale + κ_2 Research + κ_3 Debt or Financing + κ_4 Employee + κ_5 Shareholder or Ownership + ε (4')

ROA_adjusted = α + β_1 CTO_dum_fy + β_2 Size + β_3 BtoM + β_4 ROA_adjusted (Year = -1) + $\sum_j \delta_j$ Content_dum$_j$ + $\sum_l \eta_l$ Year_dum$_l$ + η_1 CTO_dum_fy*Purchase or Sale + η_2 CTO_dum_fy*Research + η_3 CTO_dum_fy*Debt or Financing + η_4 CTO_dum_fy*Employee + η_5 CTO_dum_fy*Shareholder or Ownership + κ_1 Purchase or Sale + κ_2 Research + κ_3 Debt or Financing + κ_4 Employee + κ_5 Shareholder or Ownership + ε (5')

See Appendix E for variable definitions. H4 through H6 predict that CTO redactions related to R&D will have greater signaling impact than other types of CTOs. Therefore, I expect $\eta_2 > 0$ and that $\eta_2 > \eta_1, \eta_3, \eta_4, \eta_5$. To correct for endogeneity from the choice of applying for CTO, I estimate variants of equation (2'), (3'), and (5') that include the inverse mills ratio, which takes into account a possible selection bias, as an additional explanatory variable as discussed in section 5.1. The overidentifying restriction test supports the appropriateness of the instruments.

5.6.   Analysts' private information search following CTO redactions (H7 through H9)

H7 through H9 predict that the signal provided by the CTO redaction is only partially informative, thereby creating private information search opportunities for analysts. Specifically, H7 tests whether analyst coverage increases following CTO redaction. H8 tests whether analyst effort increases following CTO redaction. Finally, H9 tests whether the proportion of stock recommendations that are "buys" or "sells" increases following CTO redactions. To test these hypotheses, I estimate the following equations on a yearly basis. The sample to test H7 through H9 includes 10-Ks and 10-Qs in addition to 8-Ks and the unit of analysis is the firm-year as in the test of H3. All change variables (with Δ) represent change ratios.

$$\Delta AnalystCoverage \text{ or } \Delta AnalystEffort = \alpha + \beta_1 \text{ CTO\_dum\_fy} + \beta_2 \text{ Size} + \beta_3 \Delta BtoM + \beta_4 \Delta TradingVol + \sum_j \delta_j \text{ Content\_dum}_j + \sum_l \eta_l \text{ Year\_dum}_l + \sum_k \zeta_k \text{ Ind\_dum}_k + \varepsilon \qquad (6) (7)$$

$$\Delta AnalystRecommendation = \alpha + \beta_1 \text{ CTO\_dum\_fy} + \beta_2 \text{ Size} + \beta_3 \Delta BtoM + \beta_4 \Delta AnalystCoverage + \beta_4 \Delta AnalystEffort + \beta_4 \Delta ForecastDispersion + \sum_j \delta_j \text{ Content\_dum}_j + \sum_l \eta_l \text{ Year\_dum}_l + \sum_k \zeta_k \text{ Ind\_dum}_k + \varepsilon \qquad (8)$$

See Appendix E for variable definitions. The coefficient on *CTO_dum_fy* (β_1) provides a test of H7 through H9, reflecting the extent to which CTO redactions are associated with analyst behavior. If analysts believe that the market reaction to CTO redaction is imperfect and there exists private information that helps improving firm valuation then I expect β_1 to be significantly positive for all three regressions. I control variables that potentially affect change in analyst behavior - firm size, book-to-market ratio, trading volume, and forecast dispersion (only for H9). To correct for endogeneity from the choice of applying for CTO, I also estimate variant of equations (6), (7), and (8) that include the inverse mills ratio, which takes into account a possible selection bias, as an additional explanatory variable as discussed in section 5.1. The overidentifying restriction test supports the appropriateness of the instruments. Similar to the

tests in section 5.5, I also test expanded versions of equation (6), (7), and (8) that include

interactions of the CTO indicator variable with indicator variables for the type of information

redacted.

Chapter 6: Empirical results

6.1.   Descriptive statistics

Table 4 provides descriptive statistics for variables used in analyses comparing the CTO group and the non-CTO group. The CTO indicator, 3-day excess return (CAR), and analyst EPS forecast revisions pertain to the sample that consists of 8-Ks with material contracts with at least one exhibit. All other variables pertain to the sample of firm-years with a 10-K, 10-Q, or 8-K that contains at least one exhibit. The sample in this descriptive table is the same as the sample used in the regression analyses. 3-day excess return (CAR) is significantly larger for the CTO group, which provides a preliminary indication that the market reacts favorably to the redacted information by CTOs in 8-Ks with material contracts. Although the magnitude of analyst EPS forecast revisions is not significantly different between the CTO and non-CTO groups, there is a greater incidence of upward forecast revisions for the CTO observations, consistent with H2. Industry-adjusted ROA is significantly greater for the CTO group, providing preliminary support for H3. Change in analyst coverage and change in buy or sell recommendation are significantly larger for the CTO group, providing preliminary support for H7 and H9, respectively. Although the change in analyst effort is not significantly different between the CTO and non-CTO groups, the number is larger for the CTO group (H8).

Firm characteristics are quite different between redacting and non-redacting firms. Comparisons are based on firm-years that redact versus non-redact. Firm size measured by total assets is smaller for firms that redact, indicating that firms having CTOs are relatively smaller firms. Accounting performance measured by ROA is superior for non-redacting firms, and there are more instances of reporting losses when firms have CTOs. The mean value of book-to-

market ratio is larger for the non-redacting group, but the difference is not significant, and the median value is significantly larger for the non-redacting group. The sales-growth ratio from the previous year is larger for the CTO group, although only the median difference is significant. Firms issue more debt and equity (seasoned equity offering) in the year with CTO redaction, and a smaller Herfindahl index for the CTO group indicates that CTO firms tend to be in more competitive industries, which is consistent with a higher need to protect proprietary information for redacting firms. Redacting firms have higher portion of research and development expenses, although only the median difference is significant, and the portion of intangible assets is also larger for the redacting firms. Redacting firms are in general younger than non-redacting firms. Redacting firms have larger trading volume than non-redacting firms.

6.2.   Regression results

6.2.1. Predicting the decision to redact

Table 5 presents the results of estimating equation (1) to examine the factors that predict the decision to redact using CTO. I find that firms are less (more) likely to redact information when issuing long-term debt (equity). This is consistent with the idea that firms tend to disclose more information in issuing debt to lower information asymmetry between insiders and outsiders, because debtors worry about downside risk. But for equity issuance, investors care more about upside potential and the value of a firm. Thus, firms with valuable proprietary information can protect the information from their competitors and signal to the market (equity investors) by the redaction that the firm is in possession of valuable information. I also find that firms in more competitive industries are less likely to redact information, which indicates that firms in highly competitive industries are less likely to have proprietary information, and firms

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with larger asset size, a lower intangible asset ratio, and a lower book-to-market ratio are more

likely to redact. Firms suffering from losses are more likely to withhold proprietary information,

and this result is not from the motivation of hiding bad earnings because the SEC must approve

the confidential treatment request. Firms with losses may have a stronger incentive to protect

their value-relevant proprietary information. Lastly, younger firms are more likely to withhold

information using a CTO. These results are consistent with the results in Verrecchia and Weber

(2006) overall.

6.2.2. Test of H1

Table 6 presents the results of estimating equation (2) on the 8-Ks with material

contracts. Consistent with H1, the coefficient on the CTO indicator is significantly positive at $p <$

0.01 and $p < 0.05$ for each specification. This finding indicates that the market reacts favorably

to CTO redactions, consistent with the CTO process minimizing adverse selection concerns and

serving as a credible signal of the favorable nature of the redacted information. The coefficient

on the inverse mills ratio is significant, which indicates a selection bias. The result is still

significant after taking care of the CTO redaction as a choice variable using the Heckman model.

Untabulated first-stage regression shows statistical significance for most of the exclusion

variables, and pseudo R^2 is above 15%. The overidentifying restriction test supports the validity

of the exclusion variables in the model.

6.2.3. Test of H2

Table 7 presents the results of estimating equation (3) and (4) on the 8-Ks with material

contracts. Consistent with H2, the coefficients on the CTO indicator variables are significantly

positive at $p < 0.01$ ($p < 0.05$ for column (2)) in Panel A. The results complement the market

reaction results in Table 6 examining analysts' reaction to the confidential treatment request in

addition to the market. Specifically, analysts revise upward their individual EPS forecasts to a

greater degree for CTO redactions, indicating that analysts interpret nondisclosure supported by

a CTO as a signal of good news. Panel B presents the results with sub-samples for one-, two-,

and three-year ahead EPS forecast changes respectively. The results in Panel A are mostly driven

by the first two years ahead EPS forecasts. For the three-year ahead EPS forecast change, the

coefficient on the CTO indicator variable is positive but not significant. The results still hold

after taking care of the CTO redaction as a choice variable using the Heckman model, and the

model has valid support to correct the endogenous choice of CTO redaction.

6.2.4. Test of H3

Table 8 presents the results of estimating equation (5). Consistent with H3, firms with

CTO redaction outperform their non-redacting peers in the long run. The coefficient on the CTO

indicator is significantly positive for all years, indicating that firms with CTOs have initially

higher industry-adjusted ROAs than their non-CTO counterparts (untabulated) and maintain their

higher performance for at least three years following the redaction. The results confirm that the

act of CTO redaction is indeed driven by the existence of favorable proprietary information, and

thus CTO redaction is positively associated with future financial performance. The results still

hold after taking care of the CTO redaction as a choice variable using the Heckman model, and

the model has valid support to correct the endogenous choice of CTO redaction.

6.2.5. Tests of H4 through H6

H4 through H6 predict that the signaling impact of CTO redactions will vary by the type of information redacted. Table 9 presents the results of estimating equation (2'), which is an extension of equation (2), which tests H4. Of the various interaction terms, the coefficients on the interaction of the CTO indicator and the research indicator are significantly positive at $p <$ 0.01 and $p < 0.05$ for Columns (1) and (2) respectively. This finding means that research-related CTO redaction leads to more positive reactions than other type of CTO redactions.

Table 10 presents the results of estimating equations (3') and (4'), which test H5. For Panel A, the coefficients on the interaction of the CTO indicator and the research indicator are significantly positive at $p < 0.1$ and $p < 0.05$ for Columns (1) and (2) respectively, and the interaction of the CTO indicator and the employee indicator are significantly negative at various significance levels. Hence, analysts appear to respond more favorably to research-related CTO redactions than to other types of redactions, consistent with H5. Support for H5 does not extend to Column (3), where the coefficient on the interaction of the CTO indicator and the research indicator is positive but insignificant. Analyst forecast revisions are more unfavorable for redactions related to employee contracts, while redactions associated with ownership and shareholder contracts are associated with a greater likelihood of upward forecast revisions. Taken collectively, the results in Table 10 provide partial support for H5. Results from Panel B present that more favorable response to research-related CTO redactions than to other types of redactions in Panel A are mostly driven by a three-year ahead forecast change, and is consistent with the explanation that research-related CTO is value-relevant for longer-term performance.

Table 11 presents the results of estimating equation (5'), which tests H6. The coefficients on the interaction of the CTO indicator and the research indicator are significantly positive for

industry-adjusted ROA measured 3 years after the CTO, indicating that the differential signaling impact of research-related CTO redactions relates primarily to long-term performance. This result is also consistent with analysts forecast revision results from Panel B of Table 10. The interaction of the CTO indicator and the financing indicator is negative significant and the interaction of the CTO indicator and the employee indicator is partly negative significant until the second year. It indicates that financing- and employee-related redactions are associated with less favorable future accounting performance than other content-related CTOs, and the differential effect of employee-related CTOs disappears in year three.[12]

6.2.6. Tests of H7 through H9

Table 12 presents the results of estimating equation (6), which tests H7. Consistent with H7, the coefficient on the CTO indicators are significantly positive for Column (1) and (2). This finding indicates that analyst coverage increases following CTO redaction. However, the impact of CTO redaction on the change in analyst coverage does not vary by the type of information redacted. The coefficients on the interaction of the CTO indicator and information content are not statistically significant for Column (3) and (4).

Table 13 presents the results of estimating equation (7), which tests H8. Consistent with H8, the coefficient on the CTO indicators are significantly positive for Column (1) and (2). This finding indicates that analyst effort increases following CTO redaction. Specifically, analysts respond to the CTO redaction by reducing the number of other firms they cover, presumably to

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[12] This negative significance does not indicate that the impact of CTO with these contents are negatively associated with industry-adjusted ROA, but it only indicates relative signaling impact among different types of information redacted.

devote more time to the CTO firm. However, the impact of CTO redaction on the change in analyst effort does not vary by the type of information redacted. The coefficients on the interaction of the CTO indicator and information content are not statistically significant for Column (3) and (4).

Table 14 presents the results of estimating equation (8), which tests H9. Consistent with H9, the coefficient on the CTO indicators are significantly positive for Column (1) and (2). This finding indicates that the proportion of stock recommendations that are "buys" or "sells" increases in the year of CTO redaction. Column (3) and (4) show that among the various interaction terms, the coefficients on the interaction of the CTO indicator and the debt/financing and employee indicator are significantly negative at $p < 0.05$ and $p < 0.10$ respectively. This finding means that debt/financing and employee-related CTO redaction lead to less increase in the proportion of recommendation that are "buys" or "sells" than other types of CTO redactions

6.3. Supplemental analysis

6.3.1.   Absolute market reaction to SEC filings with CTO redactions

As a supplemental analysis to Table 6, I examine whether there is any difference in absolute market reactions to SEC filings with and without CTO redactions. A 3-day excess absolute return (absolute CAR) is used instead of a 3-day excess return (CAR) in equation (2). In an untabulated test, the coefficient on the CTO indicator variable is insignificant. Similar absolute magnitude of market reaction for both groups rules out the explanation that 8-Ks with confidential treatment are less important than 8-Ks without it in terms of information disclosed in the form.

6.3.2. Alternative analyst forecast measure

As an alternative test of H2, I examine analyst sales forecast revisions around 8-K filings. In untabulated analyses using equations (2) and (3) with sales forecast revision as a dependent variable, I find that analysts do not significantly change sales forecast with confidential treated information. With the positive coefficients on the CTO indicator variables for EPS forecast changes, the increase in EPS forecasts originates from anticipated decreases in costs rather than anticipated increases in revenue.

6.3.3. Alternative performance measures

To gain further insight into the source of CTO firms' more favorable performance, I examine alternative future performance measures. I substitute alternative industry-adjusted performance measures for ROA in equation (4). In untabulated analyses, CTO firms are associated with more favorable performance in the test using EBITDA/SALES, which is consistent with the results in Tables 8 and 11. The book-to-market ratio is lower for firms with CTOs, indicating that the market evaluates firms with CTOs as having higher potential than their non-CTO counterparts. SALES and market-share tests show that firms with CTO are not associated with higher SALES or increase in market share. These results are consistent with the analyst sales forecast revision results discussed in section 6.3.2 and indicate that a decrease in costs rather than an increase in industry-adjusted sales or market share is the source of the higher performance of CTO firms.

6.3.4. Supplemental analysis of results of analysts' private information search following CTO redactions

To gain further insight as to the nature of market reaction to CTO redaction, I examine whether recommendation revisions are systematically weighted toward either buy or sell recommendations. I substitute buy recommendation ratio among all type of recommendation for the recommendation change (buy or sell) ratio in equation (8). In untabulated analyses, analysts issue more buy recommendations in the year with CTO. This finding means that analysts believe that the market underreacts to CTO redaction in general and that the buy strategy is profitable in the years with CTO.

Chapter 7: Conclusion

In contrast to prior research, I document that the market and analysts react *favorably* to the voluntary nondisclosure of proprietary information using the SEC's confidential treatment request. This finding indicates that the SEC's confidential treatment order process works as a credible communication channel of the proprietary nature of the withheld information, and it allows firms to avoid punishment from the stock market for nondisclosure. In fact, a firm's willingness to submit to the CTO process serves as a credible signal that the firm is in possession of valuable favorable information. Additionally, there is a cross-sectional variation in investors' perception of the value of redacted information. Reactions are more (less) favorable to the redaction of information that is more (less) likely to be associated with future firm profitability. Furthermore, I show that the redacting firms experience an accounting performance superior to that of their peers in the years following the redaction, which is consistent with the market and analysts' responses to the redaction. This latter finding suggests that the withheld information allows redacting firms to achieve better future performance by protecting proprietary information from their competitors. The results of this study suggest a possible role of an assurance channel to facilitate communication between insiders and outsiders.

Although I demonstrate that CTO redaction serves as a credible signal about the favorable nature of undisclosed information, I also show that analysts engage in more intense private information search following CTO redactions as reflected in increased analyst coverage, effort, and proportion of analyst recommendations that are "buys" or "sells". Increased private information search by analysts following CTO redactions suggests that the signal provided by a

CTO redaction is not fully informative about the economic magnitude of the undisclosed information, which creates private information search opportunities and incentives.

This paper adds to prior theoretical and empirical works on the implications of nondisclosure by focusing on a setting where managers can credibly convey the reason for nondisclosure, which hasn't been introduced or tested before. I broaden the examination of the implications of nondisclosure to a setting where there is the external assurance mechanism of the proprietary nature of the undisclosed information. The results suggest a channel that firms can protect proprietary information whose disclosure would harm their competitive advantage, without penalty from the market and a channel that firms credibly communicate with outsiders on their possession of favorable information. A policy implication of this paper is that a well-designed, credible signaling channel assured by the government or a third party helps the market avoid unnecessary information costs, thereby promoting increased efficiency.

Appendices

APPENDIX A. Example of approved CT order

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
May 2, 2008**

**ORDER GRANTING CONFIDENTIAL TREATMENT
UNDER THE SECURITIES EXCHANGE ACT OF 1934**

**Orthovita, Inc.
File No. 000-24517 - CF#21811**

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Orthovita, Inc. submitted an application under Rule 24b-2 requesting confidential treatment for information it excluded from the Exhibits to a Form 10-K filed on March 17, 2008.

Based on representations by Orthovita, Inc. that this information qualifies as confidential commercial or financial information under the Freedom of Information Act, 5 U.S.C. 552(b)(4), the Division of Corporation Finance has determined not to publicly disclose it. Accordingly, excluded information from the following exhibit(s) will not be released to the public for the time period(s) specified:

Exhibit 10.40	through February 21, 2017
Exhibit 10.43	through November 5, 2017

For the Commission, by the Division of Corporation Finance, pursuant to delegated authority:

Perry Hindin
Special Counsel

APPENDIX B. Example of denied CT order

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
May 21, 2009
ORDER DENYING CONFIDENTIAL TREATMENT
REQUEST UNDER RULE 24b-2
AND
NOTICE OF OPPORTUNITY TO PETITION
FOR REVIEW UNDER THE
SECURITIES EXCHANGE ACT OF 1934
Midnight Holdings Group, Inc.
File No. 33-22142 - CF#20892

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The Division of Corporation Finance denied your request for confidential treatment of the information excluded from exhibits 10.6, 10.9, 10.10, 10.11, 10.12, 10.13, 10.14, 10.15 and 10.21 to the Form 10-KSB for the fiscal year ended December 31, 2006, as filed on September 11, 2007.

We denied your request because we concluded:
* the application fails to adequately demonstrate that public disclosure of the excluded information would create a substantial likelihood of competitive harm for the time period requested.

You may request that the Commission review this order by submitting a petition to the Office of the Secretary within five days, as required by 17 C.F.R. 201.430. Otherwise, we will make the information for which you requested confidential treatment available to the public.

For the Commission, by the Division of Corporation Finance, pursuant to delegated authority:

Rolaine S. Bancroft
Special Counsel

APPENDIX C. Example of redacted information in the CT order

The document is from a FOIA request to the SEC for unredacted version of expired confidential treatment order. Circled portions are redacted in the original filing form.

EXHIBIT A

1) Alcon shall pay Contractor $342,400 for (a) the support of Contractor clinical studies of osmolarity in ocular tears using Contractor's TearLab™ System, including without limitation the study entitled "A Prospective Study to Establish Normative Values, Demographic Variations, Referent Diagnostic Values, Disease Severity Correlations for Dry Eye Disease, and Tearlab Osmometry" ($250,000) and (b) the items outlined in Paragraph 5 ($92,400). Contractor shall invoice Alcon for such payment upon execution of this Agreement.

2) Contractor agrees that Alcon shall be the sole third party corporate sponsor of such Contractor clinical studies and that Alcon shall receive appropriate acknowledgement in the publication of such studies.

3) Contractor agrees to provide Alcon under the confidentiality terms of the Agreement, access to all data at the completion of the supported clinical studies described in Paragraph 1 above. Alcon shall have the right to use such data solely for the purposes of evaluating same in connection with consideration of a continuing business relationship with Contractor relating to the results of the Research. Alcon shall not make any other use of such data without the prior written consent of Contractor.

4) Alcon shall be the only third party corporate institution to have access to the data described in Paragraph 3 above prior to publication of the data. Notwithstanding the foregoing, Alcon agrees that such data can be shared with and presented by corporate entities that do not compete with Alcon in the field of ophthalmology (or their Key Opinion Leaders) for the purpose of supporting product launch of the TearLab™ System.

5) Contractor shall deliver to Alcon 3 beta units of the TearLab™ System and 6,950 beta units of associated test cards for Alcon's use in validation activities and Alcon clinical studies. The 3 units of the TearLab™ System and 2,850 of the test cards shall be delivered to Alcon by April 15, 2008 (the "Initial Delivery Date"). 2,100 of the test cards shall be delivered to Alcon within thirty (30) days of the Initial Delivery Date. 2,000 of the test cards shall be delivered to Alcon within sixty (60) days of the Initial Delivery Date.

6) Contractor agrees to provide Alcon with a limited exclusive access to Contractor's TearLab™ System solely as follows: Until FDA clearance of the first 510(k) for Contractor's TearLab™ System osmolarity equipment, Contractor agrees that Alcon shall be only third party corporate entity that will have access to the beta units of the TearLab™ System osmolarity equipment for the purpose of conducting dry eye clinical studies for the commercial development of therapeutic compounds indicated for the treatment of dry eye in countries where the TearLab™ System is not approved for

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APPENDIX D. Form 8-K item list

In addition to filing annual reports on Form 10-K and quarterly reports on Form 10-Q, public companies must report certain material corporate events on a more current basis. Form 8-K is the "current report" companies must file with the SEC to announce major events that shareholders should know about. The instructions from the SEC describe the types of events that trigger a public company's obligation to file a current report, including any of the following:

Section 1 Registrant's Business and Operations
Item 1.01   Entry into a Material Definitive Agreement
Item 1.02   Termination of a Material Definitive Agreement
Item 1.03   Bankruptcy or Receivership
Item 1.04   Mine Safety - Reporting of Shutdowns and Patterns of Violations

Section 2 Financial Information
Item 2.01   Completion of Acquisition or Disposition of Assets
Item 2.02   Results of Operations and Financial Condition
Item 2.03   Creation of a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement of a Registrant
Item 2.04   Triggering Events That Accelerate or Increase a Direct Financial Obligation or an Obligation under an Off-Balance Sheet Arrangement
Item 2.05   Costs Associated with Exit or Disposal Activities
Item 2.06   Material Impairments

Section 3 Securities and Trading Markets
Item 3.01   Notice of Delisting or Failure to Satisfy a Continued Listing Rule or Standard; Transfer of Listing
Item 3.02   Unregistered Sales of Equity Securities
Item 3.03   Material Modification to Rights of Security Holders

Section 4 Matters Related to Accountants and Financial Statements
Item 4.01   Changes in Registrant's Certifying Accountant
Item 4.02   Non-Reliance on Previously Issued Financial Statements or a Related Audit Report or Completed Interim Review

Section 5 Corporate Governance and Management
Item 5.01   Changes in Control of Registrant
Item 5.02   Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers
Item 5.03   Amendments to Articles of Incorporation or Bylaws; Change in Fiscal Year
Item 5.04   Temporary Suspension of Trading Under Registrant's Employee Benefit Plans
Item 5.05   Amendment to Registrant's Code of Ethics, or Waiver of a Provision of the Code of Ethics
Item 5.06   Change in Shell Company Status
Item 5.07   Submission of Matters to a Vote of Security Holders
Item 5.08   Shareholder Director Nominations

Section 6 Asset-Backed Securities
Item 6.01   ABS Informational and Computational Material
Item 6.02   Change of Servicer or Trustee
Item 6.03   Change in Credit Enhancement or Other External Support
Item 6.04   Failure to Make a Required Distribution
Item 6.05   Securities Act Updating Disclosure

Section 7 Regulation FD
Item 7.01   Regulation FD Disclosure

Section 8 Other Events
Item 8.01   Other Events (The registrant can use this Item to report events that are not specifically called for by Form 8-K that the registrant considers to be of importance to security holders.)

Section 9 Financial Statements and Exhibits
Item 9.01   Financial Statements and Exhibits

http://www.sec.gov/answers/form8k.htm

APPENDIX E. Variable definitions

Dependent Variables for Hypothesis Tests:
- *3-day excess ret (CAR, Cumulative Abnormal Return)* is the sum of the excess daily returns of day (-1, +1) divided by the standard deviation of excess return. Daily excess return is calculated as the raw daily return minus the daily return on a value-weighted market portfolio. Standard deviation of the excess return is calculated as the standard deviation of the 10 daily excess returns from day (-10, -6) and (+6, +10). Day 0 represents the filing date of the 8-K.
- *Change in EPS forecast* is calculated as the revised individual analyst EPS forecast within 4 days of the 8-K disclosure minus the most recent individual analyst EPS forecast before the 8-K disclosure, scaled by the most recent individual EPS forecast before the 8-K disclosure.
- *Signed Change in EPS forecast* is an indicator variable equal to 1 if *Change in EPS forecast* is greater than zero and 0 otherwise.
- *ROA_adjusted* is the 3-digit SIC industry adjusted ROA, which is calculated as the raw ROA (EBITDA/lagged total asset) for the firm minus the mean ROA of the firms in the same SIC industry in the same year.
- *ΔAnalystCoverage* is the change of number of analysts on *IBES* providing earnings forecasts for the firm from year t to ($t-1$) divided by the value of year ($t-1$).
- *ΔAnalystEffort* is the negative of the change of the average number of firms covered by the firm's analysts from year t to ($t-1$) divided by the value of year ($t-1$).
- *ΔAnalystRecommendation* is the change of proportion of stock recommendations that are "buys" or "sells" for the firm from year t to ($t-1$).

CTO Indicator Variables:
- *CTO_dum* is an indicator variable that equals 1 if the Form 8-K has CTO-redacted information, 0 otherwise.
- *CTO_dum_fy* is an indicator variable that equals 1 if a firm has at least one confidential treatment order within the fiscal year, 0 otherwise.

Content Variables for Tests of H4 - H6:
- *Purchase or Sale* is an indicator variable corresponding to whether the exhibit relates to purchase or sale contracts.
- *Research* is an indicator variable corresponding to whether the exhibit relates to research and development contracts.
- *Debt or Financing* is an indicator variable corresponding to whether the exhibit relates to debt or financing contracts.

- *Employee* is an indicator variable corresponding to whether the exhibit relates to employee contracts.
- *Shareholder or Ownership* is an indicator variable corresponding to whether the exhibit relates to contracts with shareholders or owners.

Control Variables:
- *Item_dum$_i$* is an indicator variable that equals 1 if the topical classification of Form 8-K falls in major events i, 0 otherwise. There are total 31 *Item_dum*s. See Appendix D for the classification of the 8-K items.
- *Content_dum$_j$* is an indicator variable that equals 1 if the filing form has an exhibit that falls in the content category of j, 0 otherwise. There are total 10 *Content_dum*s. A content dummy is assigned for each of the following categories: Research and Patent, License and Royalty, Customer and Supplier, Peer, Debt and Financing, Lease, Employee, Shareholder, Ownership, and Restructuring.
- *Ind_dum$_k$* is an indicator variable that equals 1 if the firm has a certain 3-digit SIC code (represented by kth industry), 0 otherwise.
- *Year_dum$_l$* is an indicator variable that equals 1 for a certain year *l*, 0 otherwise.

- *Size* is the natural log of a firm's total assets.
- *BtoM* (Book-to-Market) is calculated as total assets divided by (total assets – book value of common/ordinary equity + market value of equity)
- *Ret_P* (Prior Return) is the market-adjusted compounded daily return over the prior six months.
- *Equity* is an indicator variable that equals 1 if a firm issues equity (seasoned equity offering, not initial public offering) within the fiscal year, 0 otherwise. (SDC)
- *Debt* is an indicator variable that equals 1 if a firm issues long-term debt within the fiscal year, 0 otherwise. (COMPUSTAT)
- *Loss* is an indicator variable that equals 1 if a firm reports negative net income, 0 otherwise.
- *Hindex* is the value of Herfindahl index. It is calculated as the sum of the squared market share of each publicly traded company in a particular two-digit SIC code. Market share is calculated as the sales of a particular company divided by the total sales of the SIC code.
- *ROA* is calculated as the EBITDA divided by the lagged total assets.
- *ROA_adjusted (Year = -1)* is ROA_adjusted calculated in the year before the CTO.
- *Sales_Gr* (Sales growth) is calculated as current year sales divided by prior year sales.
- *R&D* is the amount of research and development expenses divided by total assets.
- *Intangible* is the amount of total intangible assets divided by total assets.

- *Age* is the number of years from the first firm-year with non-missing market price in the COMPUSTAT.
- *N_Analysts* (Analyst following) is the total number of the most recent annual EPS estimates for each statistical period in IBES.
- *Dispersion (Forecast dispersion)* is calculated as the standard deviation of the most recent annual EPS forecast for a firm (from IBES) divided by the stock price at the beginning of the period.
- *Trading Volume* is the trading volume of a firm's share in millions of shares.

Table 1. Descriptive Statistics for Confidential Treatment Order

Year	2008	2009	2010	2011	2012	2013	All
# of CTOs	1,095	1,494	1,592	1,429	1,488	1,329	8,427
# of denied CTOs	1	3	0	1	2	2	9
# of exhibits in the CTOs	2,046	2,512	2,848	2,487	1,971	1,941	13,805
Average # of exhibits in the CTOs	1.9	1.7	1.8	1.7	1.3	1.5	1.6
Average length of CTOs (unit: year)	6	5	5	5	5	5	5
# of SEC filing forms in the CTOs (based on order date)	756	1,207	1,344	1,266	1,353	1,291	7,217
# of SEC filing forms in the CTOs (based on form file date)	1,179	1,331	1,433	1,249	1,120	898	7,210
# of SEC filing forms (10-K, 10-Q, 8-K) in the CTOs	663	1,069	1,158	1,080	1,143	1,041	6,154
(based on order date)	(0.88)	(0.89)	(0.86)	(0.85)	(0.84)	(0.81)	(0.85)
# of SEC filing forms (10-K, 10-Q, 8-K) in the CTOs	1,012	1,165	1,201	1,067	953	752	6,150
(based on file date)	(0.86)	(0.88)	(0.84)	(0.85)	(0.85)	(0.84)	(0.85)
# of all 10-K, 10-Q, and 8-K filings	97,917	93,526	90,441	87,509	84,671	83,154	537,218
# of 10-Ks with CTOs (based on file date)	221	313	302	255	232	201	1,524
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
# of 10-Qs with CTOs (based on file date)	587	576	645	548	487	374	3,217
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
# of 8-Ks with CTOs (based on file date)	184	235	216	232	193	152	1,212
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
# of 10-Ks with CTOs (based on order date)	151	286	291	259	285	252	1,524
# of 10-Qs with CTOs (based on order date)	383	542	597	568	588	540	3,218
# of 8-Ks with CTOs (based on order date)	115	209	234	218	226	213	1,215
# of all 10-K filings	8,364	9,573	8,993	8,637	8,286	7,887	51,740
# of all 10-Q filings	26,098	26,890	25,947	25,060	23,759	22,706	150,460
# of all 8-K filings	63,455	57,063	55,501	53,812	52,626	52,561	335,018
# of firms with CTOs	759	828	884	828	779	651	2,442

This table provides descriptive statistics for confidential treatment orders. Order date means confidential treatment order grant date and form file date means form (e.g., 10-K, 10-Q, or 8-K) filing date. Numbers in parentheses are the proportion of CTOs in 10-K, 10-Q and 8-K filing forms and the proportion of 10-K (10-Q or 8-K) forms with CTOs. Numbers of all 10-K, 10-Q, and 8-K filings include only filing forms with at least one exhibit, because a confidential treatment order is given to a specific exhibit.

Table 2. Top 12 Industries with Confidential Treatment Orders

SIC2	Description	Broader Category (10 Category)	Count	%
28	Chemicals and Allied Products	Manufacturing	1,942	27.4
73	Business Services	Services	779	11.0
36	Electronic and other Electrical Equipment and Components, except Computer Equipment	Manufacturing	540	7.6
38	Measuring, Analyzing, and Controlling Instruments; Photographic, Medical and Optical Goods; Watches and Clocks	Manufacturing	519	7.3
45	Transportation by Air	Transportation & Public Utilities	272	3.8
48	Communications	Transportation & Public Utilities	270	3.8
87	Engineering, Accounting, Research, Management, and Related Services	Services	181	2.6
49	Electric, Gas and Sanitary Services	Transportation & Public Utilities	162	2.3
61	Non-Depository Credit Institutions	Finance, Insurance, Real Estate	145	2.0
35	Industrial and Commercial Machinery and Computer Equipment	Manufacturing	141	2.0
67	Holding and other Investment Offices	Finance, Insurance, Real Estate	110	1.6
13	Oil and Gas Extraction	Mining	108	1.5
			7,096	72.8

This table provides a distribution of 2-digit SIC industries with confidential treatment orders. Count is based on number of filing forms with confidential treatment orders. I also report broader 10-category classification.

Table 3. Information Content in the Material Contract Exhibits in the 8-Ks

	All		CTO		Non-CTO		CTO/All (8-K)	CTO/All (Exhibit)
	%	Count	%	Count	%	Count	%	%
Purchase or Sales	20.2	7,094	54.4	340	19.6	6,754	4.8	2.5
Research	18.2	6,391	32.2	201	17.9	6,190	3.1	4.6
Debt or Financing	36.8	12,923	27.5	172	37.0	12,751	1.3	1.0
Employee	61.0	21,421	24.3	152	61.6	21,269	1.0	0.2
Shareholder or Ownership	22.9	8,042	35.0	219	22.7	7,823	2.7	1.1

This table provides information content in the material contract exhibits in the 8-Ks. All material contract exhibit contents are classified into the five categories of Purchase or Sales, Research, Debt or Financing, Employee, and Shareholder or Ownership. All represents the percentage and total number of 8-Ks that contain at least one exhibit for each category. CTO and Non-CTO represent 8-Ks with and without CTOs in the filings. If a single 8-K has more than two material contract exhibits and the exhibits fall in different categories, a multiple count is possible. CTO/All (8-K) represents the percentage of 8-Ks with CTO based on 8-Ks, and CTO/All represents the percentage of exhibits in the 8-Ks with CTO based on each exhibit in the 8-Ks.

Table 4. Descriptive Statistics

Variable	Confidential Treatment Sample				Non-Confidential Treatment Sample				Mean Diff	Median Diff
	Mean	Median	St.Dev.	Count	Mean	Median	St.Dev.	Count		
3-day excess return (CAR)	0.353	0.255	2.179	625	0.101	0.014	2.200	34,492	0.252***	0.241***
Change in EPS forecast	0.004	0.001	0.355	1,003	0.008	0.000	1.805	1,083,635	-0.004	0.001
Signed change in EPS forecast	0.548	1.000	0.498	1,003	0.495	0.000	0.500	1,083,635	0.054***	1.000***
ROA_adjusted	1.462	0.478	2.175	4,049	0.887	0.105	1.821	46,648	0.575***	0.373***
Change in Analyst Coverage	0.204	0.000	0.020	2,328	0.144	0.000	0.005	17,944	0.600***	0.000***
Change in Analyst Effort	-0.090	-0.465	0.509	2,328	-0.099	-0.417	0.589	17,944	0.189	-0.008
Change in Buy or Sell Recommendation	0.210	0.000	1.143	1,988	0.164	0.000	1.087	14,244	0.462*	0.000*
Asset (,000)	9.082	0.291	104.396	4,292	12.720	0.392	107.603	59,672	-3.638**	-0.101***
ROA	-0.180	-0.004	0.416	4,087	-0.110	0.011	0.382	47,900	-0.070***	-0.016***
Book-to-Market	0.280	0.239	0.323	4,061	0.373	0.248	5.818	52,948	-0.093	-0.009**
Loss	0.513	1.000	0.500	4,325	0.345	0.000	0.475	68,962	0.168***	1.000***
Equity Issuance	0.063	0.000	0.244	4,325	0.025	0.000	0.157	68,962	0.038***	0.000***
Debt Issuance	0.449	0.000	0.497	4,325	0.421	0.000	0.494	68,962	0.028***	0.000***
Hindex	0.053	0.032	0.060	4,325	0.069	0.039	0.079	68,962	-0.016***	-0.007***
R&D Ratio	0.207	0.037	1.823	4,292	0.177	0.000	10.532	59,382	0.030	0.037***
Intangible Ratio	0.143	0.049	0.195	4,292	0.128	0.023	0.196	59,382	0.015***	0.025***
Sales Growth	2.302	1.082	14.825	3,872	1.895	1.048	60.472	44,078	0.407	0.034***
Age	14.585	11.000	12.790	4,325	15.100	11.000	14.040	68,962	-0.516**	0.000
Trading Volume (,000,000)	0.298	0.080	1.159	2,683	0.290	0.067	1.086	22,191	0.008***	0.013***

This table provides descriptive statistics for the variables used in the analyses comparing the CTO group and the non-CTO group. The CTO indicator, 3-day excess return (CAR), and analyst EPS forecast revisions pertain to the sample that consists of 8-Ks with material contracts. Other variables pertain to the sample of firm-years with a 10-K, 10-Q, or 8-K that contains at least one exhibit. See Appendix E for variable definitions.

Table 5. Predicting the Decision to Redact

	Redaction using CTO
Size	0.061***
	(9.80)
ROA	0.000
	(-1.12)
Loss	0.227***
	(8.32)
Debt	-0.083***
	(-3.13)
Equity	0.240***
	(5.87)
HIndex	1.105**
	(2.02)
Book-to-Market	-0.134***
	(-4.17)
Sales Growth	0.000
	(0.36)
R & D	-0.002
	(-0.27)
Intangible	-0.291***
	(-3.66)
Age	-0.010***
	(-7.87)
Constant	-2.746***
	(-7.90)
Industry dummies	Yes
Year dummies	Yes
Cluster	Firm
Observations	44,019
Pseudo R-squared	0.134

This table provides a Probit model predicting firms' decision to redact information using confidential treatment requests. Each firm-year has a single observation. See Appendix E variable definitions. P-values are reported below in parenthesis and are based on firm-clustered robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 6. Market Reaction to Confidential Treatment Information

	3-day excess return (CAR)	
	(1)	(2)
CTO dummy	0.343***	0.260**
	(3.48)	(2.55)
Size	0.016**	0.013
	(2.22)	(1.52)
Book-to-Market	-0.093**	-0.093**
	(-2.29)	(-2.04)
Past Returns	0.009*	0.010
	(1.76)	(1.56)
Inverse Mills Ratio		-0.160***
		(-3.41)
Constant	-1.004***	-0.554***
	(-7.20)	(-2.97)
8-K Item dummies	Yes	Yes
Exhibit Content dummies	Yes	Yes
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
Cluster	Firm	Firm
Observations	33,023	25,003
Adjusted R-squared	0.004	0.004

This table provides 3-day excess market return (CAR) around 8-K filing dates (-1, +1) for firms with and without confidential treatment requests from 2008 to 2013. The sample is limited to 8-Ks with material contract, which is represented by exhibit number 10. Regression (1) is regular OLS regression. Regression (2) is treatment regression using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model. See Appendix E for variable definitions. P-values are reported below in parentheses and are based on firm-clustered robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 7. EPS Forecast Change on Confidential Treatment Information

Panel A. Full Sample

	EPS forecast revision		EPS forecast revision sign (Probit)
	(1)	(2)	(3)
CTO dummy	0.021***	0.017**	0.168***
	(2.79)	(2.16)	(2.92)
Size	0.005***	0.005***	0.015***
	(7.09)	(5.78)	(2.68)
Book-to-Market	-0.050***	-0.034***	-0.298***
	(-8.08)	(-4.67)	(-6.94)
Analyst following	0.000	0.000	0.004***
	(0.76)	(0.75)	(2.63)
Forecast dispersion	-0.063***	-0.071*	-0.077
	(-2.71)	(-1.66)	(-0.75)
Inverse Mills Ratio		-0.006***	
		(-2.58)	
Constant	-0.071***	-0.069***	-0.157
	(-2.98)	(-2.61)	(-0.98)
8-K Item dummies	Yes	Yes	Yes
Exhibit Content dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Cluster	Analyst	Analyst	Analyst
Observations	47,708	24,498	47,653
Adjusted R-squared	0.035	0.024	0.034

Panel B. Sub-Sample for Each One, Two, and Three Years Ahead

EPS forecast	EPS forecast revision					
	One year ahead		Two years ahead		Three years ahead	
	(1)	(2)	(3)	(4)	(5)	(6)
CTO dummy	0.021**	0.015*	0.029***	0.024**	0.012	0.019
	(2.26)	(1.65)	(2.58)	(2.08)	(0.71)	(1.11)
Size	0.003***	0.001	0.006***	0.007***	0.009***	0.010***
	(2.95)	(1.32)	(6.59)	(5.93)	(6.11)	(4.63)
Book-to-Market	-0.060***	-0.045***	-0.046***	-0.028***	-0.036**	-0.0351*
	(-8.11)	(-4.90)	(-5.59)	(-3.14)	(-2.56)	(-1.69)
Analyst following	0.000	0.001**	-0.000	-0.001*	0.001*	0.002**
	(1.62)	(2.08)	(-1.50)	(-1.82)	(1.76)	(2.19)
Forecast dispersion	0.056**	-0.025	-0.101**	-0.047	-0.115**	-0.165*
	(2.26)	(-0.44)	(-2.18)	(-0.84)	(-2.53)	(-1.71)
Inverse Mills Ratio		-0.007***		-0.007**		0.000
		(-2.60)		(-2.29)		(0.02)
Constant	-0.068**	-0.102***	-0.034	-0.004	-0.184**	-0.112
	(-1.99)	(-2.81)	(-0.83)	(-0.11)	(-2.34)	(-1.19)
8-K Item dummies	Yes	Yes	Yes	Yes	Yes	Yes
Exhibit Content dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Analyst	Analyst	Analyst	Analyst	Analyst	Analyst
Observations	21,741	11,317	19,280	9,963	6,687	3,218
Adjusted R-squared	0.036	0.023	0.045	0.031	0.040	0.038

EPS forecast	EPS forecast revision sign (Probit)		
	One year ahead	Two years ahead	Three years ahead
	(1)	(3)	(5)
CTO dummy	0.163**	0.228***	0.075
	(2.29)	(2.99)	(0.71)
Size	0.002	0.028***	0.030***
	(0.24)	(3.89)	(2.63)
Book-to-Market	-0.336***	-0.290***	-0.290***
	(-6.68)	(-5.47)	(-2.92)
Analyst following	0.008***	-0.004**	0.012*
	(4.59)	(-1.96)	(1.78)
Forecast dispersion	0.637***	-0.354	-0.870*
	(3.52)	(-1.54)	(-1.94)
Constant	-0.149	-0.083	-0.378
	(-0.72)	(-0.37)	(-0.99)
8-K Item dummies	Yes	Yes	Yes
Exhibit Content dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Cluster	Analyst	Analyst	Analyst
Observations	21,691	19,221	6,608
Adjusted R-squared	0.038	0.043	0.047

This table provides 4-day annual EPS forecast change around 8-K filing dates (0, +4) for firms with and without confidential treatment requests from 2008 to 2013. The sample is limited to 8-Ks with material contract, which is represented by exhibit number 10. Panel A uses annual EPS forecasts for the next three years. Panel B uses annual EPS forecasts for the next one, two, and three years separately. Odd-numbered columns ((1), (3), and (5)) are regular OLS or Probit regressions. Even-numbered columns ((2), (4), and (6)) are treatment regressions using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model. See Appendix E for variable definitions. P-values are reported below in parentheses and are based on analyst-clustered robust standard errors. For EPS forecast revision sign, Probit regression is used. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8. Long-Term Performance of Firms with Confidential Treatment Orders

	ROA (Year = 1)		ROA (Year = 2)		ROA (Year = 3)	
	(1)	(2)	(3)	(4)	(5)	(6)
CTO dummy	0.548***	0.502***	0.599***	0.556***	0.768***	0.720***
	(11.25)	(10.10)	(9.71)	(8.80)	(9.57)	(8.68)
Size	-0.054***	-0.051***	-0.079***	-0.070***	-0.105***	-0.087***
	(-10.63)	(-9.72)	(-11.99)	(-10.12)	(-12.31)	(-9.68)
Book-to-Market	0.002	0.096***	0.002	0.126***	0.001	0.208***
	(1.29)	(2.87)	(1.13)	(2.75)	(0.83)	(3.37)
ROA (Year = -1)	0.325***	0.349***	0.313***	0.341***	0.255***	0.258***
	(38.65)	(38.90)	(29.96)	(30.89)	(24.77)	(24.00)
Inverse Mills Ratio		-0.020***		-0.025***		-0.044***
		(-3.22)		(-3.01)		(-4.27)
Constant	0.667	0.914	0.668	0.714	1.056*	1.403*
	(1.12)	(1.30)	(1.18)	(0.97)	(1.75)	(1.78)
Exhibit Content dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm	Firm	Firm
Observations	29,949	27,964	22,729	21,307	16,377	15,401
Adjusted R-squared	0.149	0.161	0.112	0.123	0.077	0.079

This table provides industry-adjusted accounting performance for one year (Year = 1), two years (Year = 2), and three years (Year = 3) after filing confidential treatment requests from 2008 to 2013. Each firm has a single observation per fiscal year. Odd-numbered columns ((1), (3), and (5)) are regular OLS regression. Even-numbered columns ((2), (4), and (6)) are treatment regression using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model (See equation (0)). See Appendix E for variable definitions. P-values are reported below in parentheses and are based on firm-clustered robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9. Market Reaction to Confidential Treatment Information by Redacted Contents

	3-day excess return (CAR)	
	(1)	(2)
CTO dummy	0.452**	0.417**
	(2.35)	(2.13)
CTO * Purchase or Sale	-0.097	-0.012
	(-0.45)	(-0.05)
CTO * Research	0.878***	0.856**
	(2.71)	(2.50)
CTO * Debt or Financing	-0.116	-0.097
	(-0.47)	(-0.39)
CTO * Employee	-0.391	-0.424
	(-1.41)	(-1.49)
CTO * Shareholder or Ownership	-0.257	-0.346
	(-1.21)	(-1.56)
Size	0.015**	0.012
	(2.07)	(1.40)
Book-to-Market	-0.099**	-0.109**
	(-2.46)	(-2.43)
Past Returns	0.010*	0.012*
	(1.86)	(1.88)
Inverse Mills Ratio		0.355
		(1.40)
Constant	-1.106***	-1.827***
	(-5.13)	(-2.98)
8-K Item dummies	Yes	Yes
Exhibit Content dummies	Yes	Yes
Industry dummies	Yes	Yes
Year dummies	Yes	Yes
Cluster	Firm	Firm
Observations	33,023	25,003
Adjusted R-squared	0.005	0.004

This table provides 3-day excess market return (CAR) around 8-K filing dates (-1, +1) for firms with and without confidential treatment requests from 2008 to 2013. The sample is limited to 8-Ks with material contract, which is represented by exhibit number 10. Regression (1) is regular OLS regression. Regression (2) is treatment regression using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model. See Appendix E for variable definitions. P-values are reported below in parentheses and are based on firm-clustered robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 10. EPS Forecast Change on Confidential Treatment Information by Redacted Contents

Panel A. Full Sample

	EPS forecast revision		EPS forecast revision sign (Probit)
	(1)	(2)	(3)
CTO dummy	0.023	0.031*	0.244*
	(1.44)	(1.85)	(1.82)
CTO * Purchase or Sale	-0.010	-0.026	-0.279*
	(-0.54)	(-1.30)	(-1.86)
CTO * Research	0.045*	0.066**	0.159
	(1.65)	(2.06)	(0.77)
CTO * Debt or Financing	-0.019	-0.024	-0.124
	(-1.06)	(-1.29)	(-0.86)
CTO * Employee	-0.053**	-0.046*	-0.905***
	(-2.20)	(-1.96)	(-3.60)
CTO * Ownership or Shareholder	0.018	0.013	0.484***
	(0.93)	(0.65)	(3.21)
Size	0.005***	0.006***	0.014**
	(6.77)	(5.94)	(2.47)
Book-to-Market	-0.050***	-0.028***	-0.297***
	(-8.14)	(-3.72)	(-6.91)
Analyst following	0.000	-0.000	0.004**
	(0.28)	(-0.18)	(2.33)
Forecast dispersion	-0.064***	-0.045	-0.075
	(-2.74)	(-1.03)	(-0.73)
Inverse Mills Ratio		-0.018***	
		(-3.57)	
Constant	-0.067***	-0.065**	-0.078
	(-2.83)	(-2.52)	(-0.49)
8-K Item dummies	Yes	Yes	Yes
Exhibit Content dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Cluster	Analyst	Analyst	Analyst
Observations	47,708	24,498	47,653
Adjusted R-squared	0.037	0.027	0.036

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Panel B. Sub-Sample for Each One, Two, and Three Years Ahead

	EPS forecast revision					
EPS forecast	One year ahead		Two years ahead		Three years ahead	
	(1)	(2)	(3)	(4)	(5)	(6)
CTO dummy	0.018	0.019	0.035	0.044*	0.035	0.068*
	(0.82)	(0.90)	(1.53)	(1.88)	(0.88)	(1.68)
CTO * Purchase or Sale	0.028	0.016	-0.023	-0.036	-0.121***	-0.167***
	(1.21)	(0.70)	(-0.84)	(-1.28)	(-2.98)	(-3.69)
CTO * Research	0.014	0.025	0.050	0.087*	0.153***	0.178***
	(0.41)	(0.61)	(1.28)	(1.94)	(2.85)	(2.87)
CTO * Debt or Financing	-0.037	-0.034	-0.020	-0.033	0.016	0.009
	(-1.57)	(-1.45)	(-0.73)	(-1.19)	(0.37)	(0.20)
CTO * Employee	-0.023	0.009	-0.081***	-0.079**	-0.0859*	-0.113**
	(-0.81)	(0.30)	(-2.68)	(-2.54)	(-1.73)	(-2.41)
CTO * Ownership or Shareholder	0.008	-0.009	0.019	0.022	0.021	0.016
	(0.34)	(-0.38)	(0.68)	(0.80)	(0.51)	(0.39)
Size	0.002***	0.002*	0.006***	0.008***	0.009***	0.009***
	(2.82)	(1.95)	(6.40)	(6.09)	(5.91)	(4.05)
Book-to-Market	-0.061***	-0.036***	-0.046***	-0.020**	-0.033**	-0.036*
	(-8.26)	(-3.80)	(-5.51)	(-2.18)	(-2.28)	(-1.67)
Analyst following	0.000	0.000	-0.001*	-0.001***	0.009	0.002
	(1.26)	(1.25)	(-1.87)	(-2.65)	(1.16)	(1.55)
Forecast dispersion	0.055**	0.024	-0.101**	-0.018	-0.113***	-0.161*
	(2.23)	(0.40)	(-2.22)	(-0.32)	(-2.66)	(-1.68)
Inverse Mills Ratio		-0.028***		-0.021***		0.015
		(-4.66)		(-3.00)		(1.30)
Constant	-0.071**	-0.101***	-0.020	0.005	-0.189**	-0.117
	(-2.06)	(-2.79)	(-0.49)	(0.13)	(-2.37)	(-1.23)
8-K Item dummies	Yes	Yes	Yes	Yes	Yes	Yes
Exhibit Content dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Analyst	Analyst	Analyst	Analyst	Analyst	Analyst
Observations	21,741	11,317	19,280	9,963	6,687	3,218
Adjusted R-squared	0.037	0.026	0.048	0.035	0.046	0.048

	EPS forecast revision sign (Probit)		
EPS forecast	One year ahead	Two years ahead	Three years ahead
	(1)	(3)	(5)
CTO dummy	0.133	0.428**	0.253
	(0.75)	(2.24)	(0.92)
CTO * Purchase or Sale	-0.082	-0.490**	-0.584*
	(-0.46)	(-2.35)	(-1.87)
CTO * Research	0.213	-0.011	0.652
	(0.80)	(-0.04)	(1.61)
CTO * Debt or Financing	-0.226	-0.167	0.284
	(-1.26)	(-0.85)	(0.94)
CTO * Employee	-0.779***	-1.104***	-1.088***
	(-2.71)	(-3.64)	(-2.60)
CTO * Ownership or Shareholder	0.566***	0.596***	0.086
	(3.07)	(2.79)	(0.31)
Size	0.001	0.027***	0.029**
	(0.18)	(3.77)	(2.51)
Book-to-Market	-0.342***	-0.281***	-0.266***
	(-6.81)	(-5.27)	(-2.64)
Analyst following	0.008***	-0.005**	0.010
	(4.27)	(-2.26)	(1.38)
Forecast dispersion	0.658***	-0.363	-0.772*
	(3.55)	(-1.60)	(-1.76)
Constant	-0.070	0.045	-0.432
	(-0.33)	(0.20)	(-1.13)
8-K Item dummies	Yes	Yes	Yes
Exhibit Content dummies	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes
Cluster	Analyst	Analyst	Analyst
Observations	21,691	19,221	6,608
Adjusted R-squared	0.039	0.048	0.053

This table provides 4-day EPS forecast change around 8-K filing dates (0, +4) for firms with and without confidential treatment orders from 2008 to 2013. The sample is limited to 8-Ks with material contract, which is represented by exhibit number 10. Panel A uses annual EPS forecasts for the next three years. Panel B uses annual EPS forecasts for the next one, two, and three years separately. Odd-numbered columns ((1), (3), and (5)) are regular OLS or Probit regressions. Even-numbered columns ((2), (4), and (6)) are treatment regressions using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model. See Appendix E for variable definitions. P-values are reported below in parentheses and are based on analyst-clustered robust standard errors. For the EPS forecast revision sign, Probit regression is used. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 11. Long-Term Performance of Firms with Confidential Treatment Orders by Redacted Contents

	ROA (Year = 1)		ROA (Year = 2)		ROA (Year = 3)	
	(1)	(2)	(3)	(4)	(5)	(6)
CTO dummy	0.472***	0.453***	0.496***	0.488***	0.612***	0.606***
	(8.62)	(8.31)	(7.28)	(7.26)	(6.90)	(6.84)
CTO * Purchase or Sale	0.010	0.004	0.003	-0.012	-0.004	-0.013
	(0.54)	(0.22)	(0.10)	(-0.50)	(-0.15)	(-0.46)
CTO * Research	0.086	0.105	0.175	0.199	0.298**	0.336**
	(0.87)	(1.09)	(1.35)	(1.62)	(2.11)	(2.47)
CTO * Debt or Financing	-0.109***	-0.098***	-0.145***	-0.131***	-0.171***	-0.167***
	(-3.16)	(-2.85)	(-3.52)	(-3.19)	(-4.33)	(-4.29)
CTO * Employee	-0.054*	-0.046	-0.092**	-0.092**	-0.015	-0.015
	(-1.78)	(-1.54)	(-2.42)	(-2.40)	(-0.26)	(-0.25)
CTO * Ownership or Shareholder	0.103	0.094	0.120	0.124	0.134	0.149
	(1.53)	(1.39)	(1.48)	(1.53)	(1.20)	(1.35)
Size	-0.045***	-0.048***	-0.068***	-0.069***	-0.090***	-0.087***
	(-8.70)	(-9.01)	(-10.15)	(-9.79)	(-10.44)	(-9.68)
Book-to-Market	0.002	0.142***	0.002	0.214***	0.001	0.351***
	(1.26)	(4.25)	(1.11)	(4.67)	(0.81)	(5.61)
ROA (Year = -1)	0.323***	0.335***	0.311***	0.318***	0.255***	0.222***
	(38.80)	(36.59)	(30.12)	(27.73)	(25.00)	(19.23)
Inverse Mills Ratio		-0.187***		-0.335***		-0.569***
		(-5.10)		(-7.04)		(-9.97)
Constant	0.638	1.252*	0.627	1.359*	0.995*	2.470***
	(1.07)	(1.76)	(1.11)	(1.84)	(1.65)	(3.13)
Exhibit Content dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm	Firm	Firm
Observations	29,949	27,964	22,729	21,307	16,377	15,401
Adjusted R-squared	0.154	0.167	0.121	0.135	0.090	0.098

This table provides accounting performance of one year (Year = 1), two years (Year = 2), and three years (Year = 3) after filing confidential treatment orders from 2008 to 2013. Each firm has a single observation per fiscal year. Odd-numbered regressions ((1), (3), and (5)) are regular OLS regressions. Even-numbered regressions ((2), (4), and (6)) are treatment regressions using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model (See equation (0)). See Appendix E for variable definitions. P-values are reported below in parentheses and are based on firm-clustered robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 12. Analyst Coverage Change with Confidential Treatment Orders

	Analyst coverage change			
	(1)	(2)	(3)	(4)
CTO dummy	0.048**	0.051**	0.046	0.051*
	(2.03)	(2.10)	(1.54)	(1.65)
CTO * Purchase or Sale			-0.001	-0.002
			(-0.15)	(-0.20)
CTO * Research			-0.005	0.001
			(-0.19)	(0.02)
CTO * Debt or Financing			-0.003	-0.001
			(-0.27)	(-0.12)
CTO * Employee			0.018	0.019
			(0.89)	(0.89)
CTO * Shareholder or Ownership			-0.006	-0.014
			(-0.27)	(-0.59)
Size	-0.007**	-0.007*	-0.007**	-0.008*
	(-2.00)	(-1.92)	(-1.99)	(-1.92)
Book-to-Market Change	0.001	0.001	0.001	0.001
	(0.88)	(0.86)	(0.88)	(0.85)
Trading Volume Change	0.060***	0.063***	0.060***	0.063***
	(5.34)	(5.31)	(5.34)	(5.31)
Inverse Mills Ratio		-0.071***		-0.071***
		(-3.68)		(-3.65)
Constant	0.243***	0.354***	0.238***	0.348***
	(2.93)	(3.78)	(2.79)	(3.62)
Exhibit Content dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm
Observations	19,429	18,533	19,429	18,533
Adjusted R-squared	0.020	0.020	0.019	0.019

This table provides analyst coverage change with confidential treatment order on a yearly basis from 2008 to 2013. Each firm has a single observation per fiscal year. Odd- numbered regressions ((1) and (3)) are regular OLS regressions. Even-numbered regressions ((2) and (4)) are treatment regressions using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model (See equation (0)). See Appendix E for variable definitions. P-values are reported below in parentheses and are based on firm-clustered robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 13. Analyst Effort Change with Confidential Treatment Orders

	Analyst coverage change			
	(1)	(2)	(3)	(4)
CTO dummy	0.038**	0.040**	0.040**	0.041**
	(2.52)	(2.56)	(2.40)	(2.40)
CTO * Purchase or Sale			0.00315	0.004
			(0.74)	(0.97)
CTO * Research			0.055	0.054
			(1.56)	(1.48)
CTO * Debt or Financing			-0.009	-0.010
			(-1.00)	(-1.01)
CTO * Employee			-0.015	-0.016
			(-1.57)	(-1.63)
CTO * Shareholder or Ownership			-0.000	0.002
			(-0.02)	(0.08)
Size	0.013***	0.013***	0.0130***	0.013***
	(3.55)	(3.27)	(3.54)	(3.25)
Book-to-Market Change	-0.000	-0.000	-0.000	-0.000
	(-0.13)	(-0.22)	(-0.15)	(-0.25)
Trading Volume Change	-0.016**	-0.015	-0.016**	-0.015
	(-1.97)	(-1.52)	(-1.98)	(-1.53)
Inverse Mills Ratio		0.011		0.009
		(0.70)		(0.58)
Constant	-0.213***	-0.219***	-0.206***	-0.208***
	(-4.41)	(-3.73)	(-4.15)	(-3.48)
Exhibit Content dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm
Observations	19,429	18,533	19,429	18,533
Adjusted R-squared	0.006	0.006	0.007	0.006

This table provides analyst effort change with confidential treatment order on a yearly basis from 2008 to 2013. Each firm has a single observation per fiscal year. Odd- numbered regressions ((1) and (3)) are regular OLS regressions. Even-numbered regressions ((2) and (4)) are treatment regressions using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model (See equation (0)). See Appendix E for variable definitions. P-values are reported below in parentheses and are based on firm-clustered robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 14. Analyst Recommendation Change with Confidential Treatment Orders

| | Analyst recommendation change | | | |
	(1)	(2)	(3)	(4)
CTO dummy	0.074***	0.073**	0.097***	0.098***
	(2.62)	(2.56)	(2.87)	(2.88)
CTO * Purchase or Sale			0.008	0.009
			(0.66)	(0.68)
CTO * Research			-0.025	-0.008
			(-0.65)	(-0.20)
CTO * Debt or Financing			-0.040**	-0.038**
			(-2.16)	(-2.02)
CTO * Employee			-0.036*	-0.035*
			(-1.88)	(-1.82)
CTO * Shareholder or Ownership			0.005	-0.010
			(0.13)	(-0.29)
Size	0.030***	0.030***	0.030***	0.030***
	(6.78)	(6.68)	(6.83)	(6.70)
Book-to-Market Change	-0.000	-0.000	-0.000	-0.000
	(-0.19)	(-0.18)	(-0.19)	(-0.19)
Analyst Coverage Change	0.313***	0.319***	0.313***	0.319***
	(8.74)	(8.46)	(8.73)	(8.45)
Analyst Effort Change	0.132***	0.164***	0.133***	0.164***
	(2.58)	(3.04)	(2.60)	(3.05)
Forecast Dispersion Change	-0.090***	-0.090***	-0.090***	-0.090***
	(-3.52)	(-3.37)	(-3.52)	(-3.38)
Inverse Mills Ratio		-0.060*		-0.060*
		(-1.83)		(-1.80)
Constant	0.074	0.044	0.097	0.068
	(0.40)	(0.27)	(0.51)	(0.40)
Exhibit Content dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Cluster	Firm	Firm	Firm	Firm
Observations	15,129	14,437	15,129	14,437
Adjusted R-squared	0.055	0.057	0.055	0.057

This table provides analyst recommendation change with confidential treatment order on a yearly basis from 2008 to 2013. Each firm has a single observation per fiscal year. Odd- numbered regressions ((1) and (3)) are regular OLS regressions. Even-numbered regressions ((2) and (4)) are treatment regressions using the Heckman self-selection correcting methodology, controlling for inverse mills ratios from the first-stage model (See equation (0)). See Appendix E for variable definitions. P-values are reported below in parentheses and are based on firm-clustered robust standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

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