Summer 8-13-2010

Investor Overlap and Diffusion of Disclosure Practices

Michael J. Jung
University of Pennsylvania, mj.jung@yahoo.com

Investor Overlap and Diffusion of Disclosure Practices

Abstract
This paper examines how one firm's commitment to provide more public disclosure affects other firms' disclosure practices in subsequent periods. I develop an investor demand-driven explanation for why and when firms adopt the disclosure innovation of a first-mover firm. I test the hypothesis that overlap in institutional ownership between two firms is a mechanism by which one firm's greater disclosure creates demand pressure for the other firm to follow. Using market risk disclosures as my empirical setting, I find that a firm's decision to follow a first-mover in providing more quantitative information in its 10-K filing than is required by the SEC is positively associated with the level of, and changes in, institutional investor overlap. I also find that the association is stronger for overlap among investors with greater influence over managers' disclosure decisions, investors with incentives to demand public disclosure, and for firms whose investors are most likely to demand expanded disclosure. Overall, this evidence provides new insight into patterns of intra-industry disclosure behavior and highlights investor overlap as a source of variation in firms' information environments that can be used in future research.

Degree Type
Dissertation

Degree Name
Doctor of Philosophy (PhD)

Graduate Group
Managerial Science and Applied Economics

First Advisor
Brian J. Bushee

Second Advisor
Catherine M. Schrand

Third Advisor
Robert W. Holthausen

Keywords
Disclosure, Institutional Investors, Investor Overlap, Diffusion

Subject Categories
Accounting

INVESTOR OVERLAP AND DIFFUSION OF DISCLOSURE PRACTICES

Michael J. Jung

A DISSERTATION

In

Accounting

For the Graduate Group in Managerial Science and Applied Economics

Presented to the Faculties of the University of Pennsylvania

In Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy

2010

____

Brian J. Bushee, Supervisor of Dissertation

____

Eric T. Bradlow, Graduate Group Chairperson

Dissertation Committee

Brian J. Bushee, Associate Professor of Accounting

Catherine M. Schrand, Professor of Accounting

Robert W. Holthausen, Nomura Securities Professor of Accounting and Finance

INVESTOR OVERLAP AND DIFFUSION OF DISCLOSURE PRACTICES

DEDICATIONS

To my wife, Jadine, for her love and encouragement before and during the PhD program. May the rest of our lives be filled with happiness.

To my children, Michael and Dana, whose daily smiles, hugs and kisses make everyday wonderful. May the future bring you much joy and success.

To my parents and brother, whose love and support have always been felt.

To my parent-in-laws and sister-in-law, who are truly family now.

ACKNOWLEDGEMENTS

I greatly appreciate the advice and guidance provided by my dissertation committee: Brian Bushee (Chair), Catherine Schrand and Robert Holthausen.

I thank Chris Armstrong, Stephanie Sikes and Holly Yang for helpful comments and discussions on this paper. I am also thankful to the rest of the faculty for their advice, encouragement and time over the past four years, particularly Robert Verrecchia, Rick Lambert, Gavin Cassar, John Core, Wayne Guay and Chris Ittner.

I thank Clare Wang for entering the PhD program with me, collaborating on years of coursework, and providing countless conversations over the course of the PhD program.

I thank Ulrike Malmendier for her invaluable guidance prior to the PhD program.

I gratefully acknowledge the financial support from the Wharton School, the Deloitte Foundation and the Robert R. Nathan Memorial Foundation.

This paper has benefited greatly from the comments of workshop participants at the University of Pennsylvania, University of Michigan, Northwestern University, University of Chicago, New York University, Dartmouth College, Harvard University, University of Washington and Stanford University.

ABSTRACT

INVESTOR OVERLAP AND DIFFUSION OF DISCLOSURE PRACTICES

Michael J. Jung

Brian J. Bushee (Supervisor of Dissertation)

This paper examines how one firm's commitment to provide more public disclosure affects other firms' disclosure practices in subsequent periods. I develop an investor demand-driven explanation for why and when firms adopt the disclosure innovation of a first-mover firm. I test the hypothesis that overlap in institutional ownership between two firms is a mechanism by which one firm's greater disclosure creates demand pressure for the other firm to follow. Using market risk disclosures as my empirical setting, I find that a firm's decision to follow a first-mover in providing more quantitative information in its 10-K filing than is required by the SEC is positively associated with the level of, and changes in, institutional investor overlap. I also find that the association is stronger for overlap among investors with greater influence over managers' disclosure decisions, investors with incentives to demand public disclosure, and for firms whose investors are most likely to demand expanded disclosure. Overall, this evidence provides new insight into patterns of intra-industry disclosure behavior and highlights investor overlap as a source of variation in firms' information environments that can be used in future research.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 Introduction

This paper examines how one firm's commitment to provide more public disclosure affects other firms' disclosure practices in subsequent periods. I develop and test an investor demand-driven explanation for why and when other firms follow a first-mover's decision to change its 10-K filing to include more quantitative information about market risk than is required by the SEC. I propose that the overlapping institutional ownership between the first-mover and a potential follower is a mechanism that creates demand pressure for the follower to make a similar disclosure change.[1] I test this hypothesis using hand-collected data about market risk disclosures from 10-K filings for a sample of 153 firms in five energy and financial-related industries.

Recent studies examining "follow-the-leader" patterns of disclosure or accounting choice among a group of firms have hypothesized that the behavior is due to the effects of herding, contagion, or spillover (Brown et al. 2006; Reppenhagen 2009; Tse and Tucker 2010). In general, these studies take the action of the first-mover as exogenous and then focus on other firms' managers to predict how they respond based on their utility or cost functions (e.g., desire to deflect blame, improve decision-making). While this paper also takes the action of the first-mover as exogenous, it differs from the prior studies by considering the perspective of certain institutional investors and why they may demand greater disclosure from firms after observing it from a first-mover.[2]

[1] I focus on institutional investors because a large literature has shown they are sophisticated at processing information (Jiambalvo et al. 2002, Malmendier and Shanthikumar 2007, Mikhail et al. 2010), they are the primary targets when CFOs set voluntary disclosure policies (Graham et al. 2005), and they affect stock returns more than individual investors (Gompers and Metrick 2001).

[2] I do not focus on sell-side analysts because many small firms lack sufficient analyst coverage to compute overlap, analyst coverage tends to follow institutional ownership (O'Brien and Bhushan 1990, Bushee and

The two perspectives are not mutually exclusive, but examining the demand-driven explanation can provide new insight into the mechanisms by which one firm's disclosure behavior alters the information sets that investors have for other firms. For example, upon receiving greater disclosure from one firm they own, investors can reassess their beliefs about the disclosure quality of the other firms they own. If this reassessment results in higher perceived information asymmetry and adverse selection, then firms with high investor overlap with the first-mover will experience demand pressure to also provide greater disclosure.

This paper is also related to prior work examining the association between disclosure and *total* institutional ownership (Lang and Lundholm 1996; Healy et al. 1999; Bushee and Noe 2000), but a key difference is my focus on the effect of *overlap* in institutional ownership. I posit that overlap in ownership links two firms' information environments because an institutional investor who holds a stake in both the first-mover and a second firm continually processes financial reports and disclosures from both firms and meets with managers from each firm at various venues throughout the year.[3] Thus, if the first-mover's decision to provide greater disclosure prompts *certain* investors to reassess their beliefs about the second firm's disclosure quality, then I expect overlapping investors to be the ones who do so. In contrast, an investor who holds a stake in only the second firm (i.e., a non-overlapping investor) may not fully

---

Miller 2009), and sell-side analysts do not hold the threat of possibly selling large holdings in a firm. Nonetheless, in empirical tests, I control for overlap in analyst coverage but I do not anticipate any incremental association.

[3] Buy-side analysts repeatedly meet with managers in private meetings (Brennan and Tamarowski 2000, Hong and Huang 2005), over phone calls (Carleton et al. 1998), at investor conferences (Bushee, Jung and Miller 2009), and at the headquarters of either the firm or the buy-side analyst (Abramowitz 2006, Jackson 2009).

internalize the first-mover's change in disclosure behavior and not reassess his beliefs about the second firm, especially if the first-mover's disclosure pertains to firm-specific information. Such a scenario is likely in my empirical setting of market risk disclosures because they tend to be idiosyncratic in nature and do not help an investor assess the market risk exposure of other firms in the industry.[4]

I draw on theories on investors' costly information acquisition (Merton 1987), limited information processing capacity (Sims 2003; Peng 2005), and learning specialization (Van Nieuwerburgh and Veldkamp 2010) to provide economic rationales for why an investor does not perform a detailed analysis or read every disclosure contained in the 10-K filing of a firm in which he or she has no investment. There has also been empirical evidence of similar inattention, namely, that information on customer-supplier relationships disclosed in 10-K filings tend to be overlooked by investors who do not own both the customer and supplier firms (Cohen and Frazzini 2008).

My main hypothesis is that a firm's decision to follow an industry first-mover's commitment to provide more public disclosure is positively associated with the overlap in institutional ownership between the two firms. In my setting, committing to more public disclosure means making a sticky change to a 10-K filing to include more quantitative formats in the market risk disclosure than is required by the SEC.[5] I

---

[4] The idiosyncrasy of a firm's market risk disclosures arises because each firm can manage its exposure to market risk in unique ways using many types of derivatives, natural hedges, pricing contracts and risk management policies.

[5] See Linsmeier and Pearson 1997 for a full discussion of these formats and the Appendix for examples. These disclosures are "sticky" because once added, firms tend not to remove them in future filings due to concerns that such an action will be view negatively by investors (discussed further in Sections 2 and 7).

measure the potential follower's disclosure decision using two dichotomous variables to indicate whether the firm discloses multiple formats (tabular, sensitivity analysis, or value-at-risk) or a single format (as required by the SEC) and whether the firm changed its disclosure from the prior year to include multiple formats. In a levels analysis, I find that a firm is more likely to disclose multiple formats if there is higher investor overlap with the industry first-mover, controlling for other determinants of a firm's market risk disclosure. In a changes analysis using lead-lag regressions, I find that an increase in investor overlap leads to an increase in the number of disclosed formats for the follower firm, but not vice versa. This evidence on the relative timing of the disclosure change is consistent with the explanation that, conditional on a first-mover's decision to provide more market risk information, overlapping investors come to demand a similar change in disclosure from the other firms they own in subsequent periods.

To further distinguish my demand-driven explanation from other "supply-side" explanations (e.g., herding), I test cross-sectional predictions based on expected variation in the level of influence that institutional investors have over managers' disclosure decisions and the incentives that investors have to demand public disclosure. I find that overlap among large institutional investors drives the positive association more than overlap in small institutional investors, consistent with large institutions having more influence over managers' disclosure decisions. Using the classifications of institutional investors from Bushee (1998, 2001), I find in the changes analysis that the association holds for overlap among "quasi-indexer" and "transient" investors but not "dedicated" investors. This evidence provides support for the hypothesis that quasi-indexers and transients prefer more public disclosure while dedicated investors have better access to private information (consistent with findings from Bushee and Noe 2000). Lastly, I find evidence consistent with overlapping investors having more incentive to demand expanded disclosure from firms in which they have greater uncertainty, conditional on observing greater disclosure from a first-mover.

I then conduct a series of additional analyses to test certain assumptions underlying my hypotheses, examine possible alternative explanations, and investigate the robustness of the results under different research designs. First, I test whether firms that follow the first-mover gain more institutional investment than firms that do not, as one assumption underlying my main hypothesis is that institutional investors pressure firms through implicit or explicit threats to sell or not buy additional shares in the firm. I compute each institutional investor's percentage ownership in the sample firms during the quarters immediately before and after the 10-K filing and find that the change in ownership is greater (more positive) for firms that follow the first-mover. Second, I test for a herding effect by including a variable similar to those used in prior herding studies to help distinguish the effect of overlapping institutional investors. Results suggest there is a positive herding effect in my disclosure setting, and that the effect of overlapping ownership is distinct from the herding effect. Third, I test whether overlap in ownership with the industry *second-mover* has any incremental association with a potential follower firm's disclosure decision. I do not find evidence of such an association, suggesting that measuring overlap in ownership with the industry first-mover is the appropriate specification. Fourth, I probe deeper into the previously-mentioned cross-sectional results by partitioning overlapping ownership into six mutually-exclusive groups based on size (large and small) and type (dedicate, quasi-indexers and transients). Consistent with the main results, I find that the positive association between investor overlap and a firm's decision to follow a first-mover is driven by large institutions and institutions classified as quasi-indexer and transient investors. Fifth, I test whether a firm's change in market risk disclosure may be associated with a change in derivatives use, rather than a change in overlapping ownership. However, using a market-based test of a firm's stock return sensitivity to changes in oil prices (for energy firms) or interest rates (for financial firms), I do not find evidence that a firm's derivative use changed between years in which it disclosed single and multiple quantitative formats. Sixth, I use an instrumental variables approach to address potential endogeneity arising from unobservable confounding factors that could affect investor overlap and firms' disclosure decisions. I run two-stage regressions to repeat the levels and changes analyses and find results consistent with the main results. Finally, as an alternative framework to test the effect of investor overlap on a firm's decision to follow a first-mover, I conduct a duration analysis to model the number of years that it takes before a firm follows (if ever). The results are consistent with the main findings and indicate that an increase in investor overlap increases the probability that a firm will follow the first-mover given that it has not done so already.

This study contributes to the disclosure and institutional investor literatures in several ways. First, to the best of my knowledge, this paper is the first to hypothesize and empirically show that overlap in institutional ownership between two firms is associated with one firm's decision to follow the other's disclosure behavior. This evidence provides new insight into patterns of intra-industry disclosure behavior (i.e., how one firm's disclosure innovation diffuses to other firms) and a better understanding of how one firm's commitment to greater disclosure can affect investors' perceptions of the other firms they own. Second, by examining one specific type of disclosure over time and associating changes in that disclosure to changes in (overlapping) institutional ownership, I conduct a more direct test of how investors can exert pressure on firms to disclose information. This evidence adds to prior research that documents an association between institutional ownership and firm disclosure using third-party ratings of disclosure quality (e.g., Healy et al. 1999). Third, my focus on investor overlap highlights a new way to partition firms' institutional investor bases, and importantly, a new source of variation in firms' information environments that can be used in future research to examine variation in information transfers (e.g. Foster 1981; Thomas and Zhang 2008), return co-movements, and other capital market effects between pairs of firms.[6]

The rest of this paper is organized as follows. In the next section, I develop my hypotheses and provide background on market risk disclosures. I then describe my data in Section 3 and analyses in Section 4. I present my results in Section 5 and additional analyses in Section 6. I provide additional discussions and reviews of the extant literature on market risk disclosures and institutional investors in Sections 7 and 8, respectively. Finally, I conclude in Section 9.

---

[6] For example, the synchronicity literature examines the association between firms' stock returns and industry returns and how market participants affect the association (e.g., Piotroski and Roulstone 2004).

2.0 Hypothesis Development

2.1 Overlap in Ownership as a Mechanism for Intra-Industry Disclosure Demand

Conditional on one firm's new commitment to provide more public disclosure, I conjecture that institutional investors of that firm will eventually demand a similar commitment from the other firms they own and those firms will experience demand pressure to follow the first-mover. The effect is likely to be strongest for firms in the same industry as the first-mover because the buy-side analysts employed by institutional investors typically follow firms along industry lines. While some institutional investors may have better access to private information and actually prefer less public disclosure, most investors view greater disclosure positively in reducing information asymmetry, adverse selection, and uncertainty about a firm. Thus, I expect that conditional on a first mover's commitment to greater disclosure, the other firms in the industry that are most (least) likely to feel pressure to follow in subsequent periods are those that have a large (small) overlap in institutional ownership with the industry first-mover.

An important assumption in my hypothesis is that a first-mover's enhanced disclosure is internalized more by current shareholders than by investors without an ownership stake. Accordingly, investors in a given firm that *do not* also own the first-mover (i.e., non-overlapping investors) are less likely to exert pressure on the firm to follow the first-mover. While this assumption is inconsistent with complete and frictionless markets where all investors fully incorporate all disclosures from all firms, I draw on theories of costly information acquisition, limited information processing capacity, and learning specialization to provide economic rationales for why an investor overlooks some of a firm's disclosures if he or she has no investment in the firm (I also review empirical evidence of such investor inattention in Section 8).

Since information about firms is costly to acquire and process (Merton 1987), even institutional investors with dedicated research analysts, large travel budgets, and advanced information technology, do not closely monitor all firms in the market.[7] Investors likely track earnings reports and important news events for a wide set of firms, but I do not expect an investor to have a deep understanding of a firm's 10-K filing and be able to recognize year-to-year changes in the filings unless the investor has a stake in the firm. Furthermore, because investors' learning and processing capacities are finite, there are cognitive limits to: i) the number of firms investors can monitor (even if they are aware of more); ii) the depth of knowledge that investors can acquire for each firm; and iii) the speed at which investors process new information about some firms (Sims 2003; Peng 2005). For these reasons, an investor without an ownership stake in the first-mover may not fully internalize or even notice the first-mover's expanded 10-K market risk disclosures, especially since such information tends to be idiosyncratic (i.e., the market risk information disclosed by the first-mover does not help the investor value or assess the market risk of the firms that he or she does own).

Costly information acquisition and limited capacity also provide an explanation for why investors focus on learning about firms they already own or intend to own. This effect has been highlighted in recent analytical work by Van Nieuwerburgh and Veldkamp (2010), who present a model of an investor's joint decisions of information

[7] Legal considerations also restrict the number of firms that certain institutional investors may consider for investment. For example, prudent person laws cause banking institutions to tilt the composition of their portfolios toward stocks that are viewed by courts as prudent (Del Guercio 1996).

learning and portfolio investment when learning capacity is limited. A key feature of their model is that the interplay between learning and investing creates a feedback effect where an investor who chooses to learn about a firm expects to own more of it, which makes learning about that firm more valuable. The result is that learning specialization arises because there are decreasing costs (i.e., less capacity used) and increasing benefits to learning about firms that the investor already owns or intends to own.

A second important assumption of the conjecture that overlapping institutional investors will demand a similar commitment from the other firms they own is that most institutional investors prefer more public disclosure. Institutional investors who have less access to private information about the firms they own should prefer more public disclosure, as that will reduce the amount of information asymmetry between those investors and firm managers and between those investors and investors with better access to private information (e.g., Glosten and Milgrom 1985). For instance, a first-mover's decision to change its 10-K to include more quantitative formats about market risk than is required by the SEC reduces investor uncertainty about the sensitivity of the first-mover's cash flows to market risk. I refer to such a decision as a commitment to greater disclosure because rarely did firms in my sample reverse their decision by reducing the number of formats in future filings. Therefore, I expect overlapping investors will seek to reduce that same type of uncertainty (every year going forward) for the other firms they own by demanding a similar disclosure commitment.

A third assumption is that firms face a cost-benefit tradeoff to follow a first-mover and that the trade-off is affected by demand pressure from overlapping investors.

For firms that feel demand pressure to follow the first-mover, prior work has shown that a commitment to greater disclosure can lead to a lower cost of capital (Leuz and Verrecchia 2000) and increased stock liquidity (Diamond and Verrecchia 1991). In contrast, a lack of commitment to provide more detailed quantitative information about market risk leaves investors with greater uncertainty about how shocks to interest rates or energy prices will affect the cash flows of the sample firms.

However, what prevents a corner solution in which all firms follow the first-mover are the costs of including more information than necessary in a 10-K filing. There may be direct costs to including multiple quantitative formats if, for instance, the services of an outside consulting firm are required to produce multiple sophisticated risk analyses. Firms may not be willing to bear these costs if they have already met the SEC requirements using a single format. Besides the direct costs, firms may not want to commit to disclosing multiple formats in future 10-K filings. New disclosures added to 10-K filings are often sticky because it is difficult to omit them in future filings, as investors may perceive the omission as a negative signal. This situation is modeled analytically in Einhorn and Ziv (2008), who use a multi-period disclosure setting to show that voluntary disclosure in one period implicitly commits firms to repeat the disclosure in the future, which makes firms less willing to voluntarily disclose in the first place. Survey evidence is consistent with this belief, as CFOs state they do not want to set disclosure precedents they cannot maintain (Graham et al. 2005). Also, managers who already disclose a table may be wary of disclosing estimated losses in a sensitivity or value-at-risk analysis based on hypothetical market movements because of the possibility that actual losses could be worse. Finally, managers may simply want to limit the number of formats to the required minimum because additional formats may suggest the firm is more exposed to market risk than was previously anticipated by the market. Based on these potential costs, I do not expect all firms to follow an industry first-mover's decision to disclose multiple formats unless there is significant demand, which I have argued will most likely come from overlapping investors.

Based on the theories and institutional details discussed above, my first hypothesis is that, conditional on an industry first-mover's new commitment to provide more public disclosure, the decision by other firms to make a similar commitment is positively associated with the overlap in institutional ownership with the first-mover.

H1: A firm's decision to follow an industry first-mover's commitment to greater disclosure is positively associated with the overlap in institutional ownership with the first-mover.

I next examine whether the association (if it exists) is stronger for overlap among certain types of institutional investors. Because institutions vary in their level of influence over managers, one should expect the association to be stronger for overlap in investors that have the most influence over corporate decisions. Evidence from the shareholder activism literature suggests that large institutions such as pension funds have the most influence over corporate decisions through direct negotiations or the threat of proxy fights (Smith 1996; Carleton et al. 1998). However, I expect other institutions with large total assets under management (e.g., Fidelity Investments) can also apply great pressure if they have a sizable position in the firm or have the potential to take a sizeable position. Thus, if large institutional investors have greater influence over managers than small institutional investors, then the positive association hypothesized in H1 will be stronger for overlap in large institutional investors.

H2: Overlap in large institutional investors, relative to overlap in small institutional investors, has a stronger association with a firm's decision to follow an industry first-mover's commitment to greater disclosure.

Institutional investors can also vary in their preferences for public disclosure vs. their ability to obtain private information. I use the Bushee (1998, 2001) classifications for institutional investors to partition institutions as either "dedicated," "quasi-indexer," or "transient." Dedicated institutional investors are characterized as long-term holders who have large, concentrated investments in a firm, and thus, are most likely to have access to private information about a firm's exposure to market risk. Quasi-indexers also have low portfolio turnover but highly diversified holdings, while transients have high turnover and diversified holdings. Bushee and Noe (2000) argue and find results consistent with quasi-indexers relying on corporate disclosures as a low-cost mechanism for monitoring firms and transients favoring firms with more forthcoming disclosures because it lessens the price impact of trades. Therefore, I expect the positive association hypothesized in H1 to be stronger for overlap in quasi-indexers and transients than dedicated investors.

H3: Overlap in quasi-indexer and transient investors, relative to overlap in dedicated investors, has a stronger association with a firm's decision to follow an industry first-mover's commitment to greater disclosure.

Finally, I examine variation in the types of firms that overlapping institutional investors will most likely demand a commitment to greater disclosure, conditional on an industry first-mover's earlier commitment. While overlapping investors may eventually demand greater disclosure from all firms they own, I expect the greatest pressure to be felt by firms in which investors have the greatest uncertainty. I use a firm's idiosyncratic stock return and volatility to proxy for investor uncertainty. Therefore, my last hypothesis is as follows:

H4: The association between overlap in institutional ownership and a firm's decision to follow an industry first-mover's commitment to greater disclosure is stronger for firms in which investors have greater uncertainty.

Test results that support the last three cross-sectional predictions (H2-H4) would be consistent with my investor demand-driven explanation and help distinguish it from supply-side explanations such as herding and changes in firms' hedging behavior.

2.2 Market Risk Disclosures

The empirical setting that I use to test my hypotheses is quantitative disclosures about market risk, as required by Financial Reporting Release (FRR) No. 48 (issued January 1997 by the SEC) and now contained in all firms' 10-K filings (discussed further in Section 7).[8] The rule requires firms to disclose their exposure to market risks related to changes in interest rates, foreign currency exchange rates, commodity prices, and equity prices, but firms are given discretion over which of three possible formats to use: tabular presentation, sensitivity analysis, or value-at-risk.[9] The institutional details surrounding FRR No. 48 make it an interesting economic setting because, for the first time, firms had to quantify and disclose an inherently complex and unpredictable

[8] The full title of the rule is "Disclosure of Accounting Policies for Derivative Financial Instruments and Derivative Commodity Instruments and Disclosure of Quantitative and Qualitative Information about Market Risk Inherent in Derivative Financial Instruments, Other Financial Instruments, and Derivative Commodity Instruments."
[9] See Linsmeier and Pearson 1997 and Ryan 2007, Chapter 12, for a full discussion of these formats.

subject. Ryan (1997) described the new requirements as "revolutionary," while Linsmeier and Pearson (1997) commented that "never before had the SEC required disclosure of forward-looking quantitative risk measures" and they "represent a material change in the nature and type of information provided to investors." The newness of this disclosure setting allows me to observe firms' initial disclosure decisions, presumably based on their initial cost-benefit analyses of disclosing additional formats, and the subsequent changes from their original decision. Further, by examining how one firm's decision to include more information than required affected other firms' subsequent decisions, I can provide insight into how firms and investors approach a new and important disclosure environment and how intra-industry patterns of disclosure behavior within such an environment evolve.

This setting also addresses several research design issues. First, while the disclosures are mandatory, there is a significant discretionary component because managers have flexibility in how to quantify the information and even how much quantitative information to disclose. This flexibility resulted in significant time-series and cross-sectional variation in formats and clarity of the disclosures (Roulstone 1999), which provides statistical power to my tests. Importantly, the variation allows me to objectively identify industry first-movers as those firms that were the first to disclose additional formats beyond the minimum requirement of the SEC and more than any other firm in their respective industries. Second, the quantitative formats disclosed in any given firm's 10-K filings are idiosyncratic and difficult for investors to estimate on their own because there are many management assumptions underlying the calculations.

Prior papers examining these types of disclosures have shown that the three formats are not perfect substitutes for each other (Rajgopol 1999) and that investors (without private information) cannot always estimate precisely one format based on the information provided in a different format (Hodder and McAnally 2001; Linsmeier et al. 2002). As a result, if investors seek additional information about a firm's market risk, they are more likely to demand additional formats be included in the 10-K rather than try to estimate the information on their own or glean common information from other firms' market risk disclosures. Third, the very nature of market risk disclosures makes them highly relevant to investors in industries where market risk is inherent to a firm's core business operations (e.g., energy and financial industries). Accordingly, focusing on a sample of firms in such industries (discussed further in the next section) maximizes the relevance and demand for market risk disclosures relative to other information contained in a 10-K and, from a practical research design perspective, facilitates the hand-collection of disclosure data.

3.0 Data Description

3.1 Sample Selection

I focus on a sample of firms in the energy and financial industries.[10] I collect data from 1997 to 2007 on disclosures about commodity price risk for firms in the Crude Petroleum & Natural Gas (SIC 1311) and Petroleum Refining (SIC 2911) industries, as well as interest rate risk for firms in the National Commercial Banking (SIC 6020),

[10] Prior studies examining the usefulness of SEC FRR No. 48 market risk disclosures use a similar, but much smaller sample of firms (e.g. Rajgopal 1999, Ahmed, Beatty, and Bettinghaus 2004, Liu, Ryan and Tan 2004).

Security Brokers & Dealers (SIC 6211), and Real Estate Investment Trusts (SIC 6798) industries.[11,12] Specifically, for each year's 10-K filing, I code whether a firm discloses its market risk using: i) a single format consisting of either a tabular presentation, sensitivity analysis or value-at-risk; ii) two formats; iii) three formats; or iv) no formats. To ensure a sufficient time-series of disclosures for each firm from the inception of the SEC rule, I require a firm to have a fiscal 1997 10-K filing and one every year for at least the next six years (at least through fiscal 2003). This procedure results in a full sample of 153 firms and 1,619 firm-years.

3.2 Variable Measurement

3.2.1 Dependent Variables

I exploit the fact that in each of the five industries mentioned, there was one firm that was clearly the first to disclose more quantitative formats in its 10-K filing than any other firm (and more than was required by the SEC) and continued to do so throughout the sample period. I identify these five firms as the industry first-movers in terms of

---

[11] Although market risk includes foreign currency exchange risk and equity price risk, such risks are less relevant to the sample firms and such disclosures are not used in the empirical tests of this paper.

[12] Using 4-digit SIC codes to define industries assumes that a buy-side analyst who follows the industry first-mover also follows other firms that are primarily within the same 4-digit SIC code. This is the underlying assumption that motivates the conjecture that overlap in institutional ownership is a mechanism that facilitates intra-industry disclosure demand. I assess the reasonableness of this assumption in the following manner. While data about the span of coverage for buy-side analysts is not publicly available, I use IBES data on the span of coverage for sell-side analysts to proxy for buy-side coverage. I find that for the 40 sell-side analysts who covered Apache Corp. in 1999, the first-mover in the Crude Oil & Natural Gas industry (SIC 1311), roughly 90% of the *other* firms that those analysts covered were also in SIC code 1311. The percentage is over 80% for analysts covering petroleum refining firms (SIC 2911), 60% for national banks (the other firms were primarily state banks under SIC 6022), and 55% for brokerages. A lack of sufficient sell-side analysts covering real estate firms (SIC 6798) prevents a similar analysis. Therefore, to the extent that the span of coverage for sell-side analysts proxies for the span of coverage for buy-side analysts, basing industries on 4-digit SIC codes sufficiently captures the hypothesized overlap mechanism.

committing to greater disclosure about market risk. These firms were not necessarily the largest or most profitable firms in their industries. Subsequent to the first-mover's decision, other firms in the same industry increased their number of disclosed formats either within a few years, more than several years later, or never. I examine these leader-follower patterns and test whether their likelihood and timeliness of occurrence are associated with overlap (and changes in overlap) in institutional ownership.

I define two dependent variables to capture the disclosure decisions of the potential followers each year. For a levels analysis, I define $MULTIPLE_{i,t}$ as an indicator variable set to 1 (0 otherwise) if firm *i* in year *t* discloses its exposure to market risk using multiple (two or three) formats. For a changes analysis, I define $INCREASE_{i,t}$ as an indicator set to 1 (0 otherwise) if firm *i* in year *t* increases its market risk disclosure from one format in the prior year to multiple formats in the current year. For some firms in the banking industry (SIC 6020), the indicator is also set to 1 if the number of formats increases from two to three.[13] While the drawback of these variables is that they are somewhat crude, they sufficiently capture a firm's decision to disclose more quantitative information than was required by the SEC and they allow me to avoid making subjective judgments about which formats are more informative for certain firms or investors.

3.2.2 Investor Overlap Variables

As discussed in prior sections, I posit that overlap in institutional ownership is a mechanism by which one firm's new commitment to provide more public disclosure prompts overlapping investors to demand a similar commitment from the other firms

[13] The first-mover in the banking industry, Bank of America, was the first to disclose three formats.

they own. Institutionally, the demands are communicated by buy-side analysts, the individuals employed by institutional investors to research firms and industries. Therefore, ideally, I would proxy for overlap in institutional ownership at the level of the individual buy-side analysts. However, the nature of the Thomson-Reuters Institutional Holdings (13F) Database limits measurement to the institution level.[14] As a result, I define $OVLPII_{i,t}$ as the number of overlapping institutional investors in December of year *t* between firm *i* in industry *k* and the first-mover in industry *k*, scaled by the total number of institutional investors in firm *i* in year *t*. Thus, the variable of interest OVLPII takes on a value between 0 and 1 and measures the fraction of a firm's institutional investor base that overlaps with an industry first-mover.

To test H2, I partition the investor overlap variable by large and small institutions, as determined by an institution's total value of assets under management. An institution is classified as large if it is in the top quintile of institutional investors ranked by total value of assets under management in year *t* ($OVLPII\_LARGE_{i,t}$).[15] I classify the remaining overlapping institutional investors (i.e., not in the top quintile) as small ($OVLPII\_SMALL_{i,t}$).

To test H3, I use the Bushee (1998, 2001) classifications for institutional investors. I define $OVLPII\_DED_{i,t}$ as the number of overlapping "dedicated"

[14] Thomson-Reuters also provides data at the mutual level. However, proxying for overlap in information demand with overlap in mutual fund ownership creates a noisier measure because each institution can manage multiple mutual funds yet rely on the same buy-side analyst. For example, if Firms A and B are owned by the same institution but within different mutual funds, then a measure of overlap in mutual fund ownership would not capture the common ownership and demand for information. Nonetheless, I test whether overlap in mutual fund ownership (U.S. equity growth funds) is associated with overlap in firms' disclosure decisions and find weaker, but still significantly positive results (not tabulated).

[15] Partitioning institutions by the top and bottom four quintiles allows for sufficient variation in both the variables for overlap in large and small institutional investors, which increases the statistical power of the test for H2. However, similar results are found when partitioning institutions by the top decile and tercile.

institutional investors in December of year *t* between firm *i* in industry *k* and the first-mover in industry *k*, scaled by the total number of institutional investors in firm *i* in year *t*. I define $OVLPII\_QIX_{i,t}$ and $OVLPII\_TRA_{i,t}$ similarly for overlap in "quasi-indexer" and "transient" institutions, respectively.

3.2.3 Control Variables

While I predict that overlap in institutional ownership is associated with a firm's decision to follow an industry first-mover's commitment to greater disclosure, it may be the case that total institutional ownership drives a firm's disclosure decision. To control for total institutional ownership, I define $PIH_{i,t}$ as the percentage of firm *i*'s total shares outstanding owned by institutional holders in December of year *t*. Moreover, information intermediaries such as sell-side equity analysts can influence firms' disclosure behaviors (Lang and Lundholm 1996). Given my focus on overlap in institutional ownership, I control for overlap in sell-side analyst coverage by including $OVLPAN_{i,t}$ as the number of unique sell-side analysts who issued a one-year sales or earnings forecast (from IBES) during year *t* for both firm *i* in industry *k* and the first-mover in industry *k*, scaled by the total number of sell-side analysts for firm *i* in year *t*.[16] To control for the fact that some firms use the same auditors as the industry first-mover and that may affect what a firm includes in its 10-K, I include an indicator variable

[16] I do not include total analysts as a control variable because in preliminary tests, that variable had over a 70% correlation with firm size and its inclusion did not change the results for the variables of interest.

$OVLPAUD_{i,t}$ set to 1 (0 otherwise) if the two firms use the same audit firm from the same office location in year *t*.[17]

The vast majority of sample firms in the five industries use derivatives, so there is less need to control for differences in firms' use of derivatives. Nonetheless, I include two indicator variables to capture if a firm uses derivatives for hedging ($HEDGING_{i,t}$=1, 0 otherwise) and/or trading purposes ($TRADING_{i,t}$=1, 0 otherwise), based on information contained in the 10-K. I also control for a number of firm, stock, and industry characteristics that may affect a firm's decision to provide more disclosure about market risk. Several studies have shown that firm size, profitability, leverage and growth are associated with increased voluntary disclosure (e.g., Lang and Lundholm 1993; Frankel et al. 1999). I control for these characteristics using the log of the market value of equity (LMV), return-on-assets (ROA), debt-to-equity (DTE) and book-to-market (BTM). All financial data required to compute these variables come from Compustat and are measured at the end of a firm's fiscal year.[18]

Several stock characteristics may be associated with a firm's disclosure policy. To capture idiosyncratic performance, I define SAR as the stock's annual size-adjusted return. To capture liquidity and idiosyncratic volatility, I define STOCKLIQ as the average monthly share turnover and STOCKVOL as the standard deviation of monthly SARs. Each variable is computed using CRSP data measured over a calendar year.

Finally, I control for industry factors that may affect firms' market risk disclosures, specifically the level and volatility of oil prices and interest rates. I define

[17] Omitting the requirement that the auditors must be from the same office location does not change the main results.
[18] For 145 of the 153 sample firms (95%), the fiscal year ends in December.

LNOILPRC as the log of the year-end spot price for a barrel of crude oil and OILVOL as the standard deviation of monthly returns on oil prices for the year, based on data from the U.S. Energy Information Administration. I define PRIMERATE as the year-end prime rate and PRIMERATEVOL as the standard deviation of monthly prime rate changes for the year, based on data from the U.S. Federal Reserve. Table 1 summarizes all variable definitions and Figure 1 shows a timeline of how all the variables are measured in levels and changes, as well as contemporaneously and with a one-year lag from the dependent variables.

4.0 Analyses

4.1 Levels Analysis

My first step in testing whether investor overlap is positively associated with a firm's decision to follow a first-mover's commitment to greater disclosure (H1), controlling for other determinants of disclosure, is to conduct a levels analysis. I estimate a logistic regression where the dependent variable ($MULTIPLE_{i,t}$) measures whether firm *i* in industry *k* includes multiple quantitative formats in its year *t* 10-K filing, and the independent variable of interest is the level of overlap in institutional investors ($OVLPII_{i,t}$) in year *t* between that firm and the first-mover in industry *k*.

$$P(MULTIPLE=1)_{i,t} = \beta_0 + \beta_1(OVLPII_{i,t}) + \beta_2(PIH_{i,t}) + \beta_3(OVLPAN_{i,t}) + \beta_4(OVLPAUD_{i,t}) + \beta_5(HEDGING_{i,t}) + \beta_6(TRADING_{i,t}) + \beta_7(LMV_{i,t}) + \beta_8(ROA_{i,t}) + \beta_9(DTE_{i,t}) + \beta_{10}(BTM_{i,t}) + \beta_{11}(SAR_{i,t}) + \beta_{12}(STOCKVOL_{i,t}) + \beta_{13}(STOCKLIQ_{i,t}) + \beta_{14}(LNOILPRC_t) + \beta_{15}(OILVOL_t) + \beta_{16}(PRIMERATE_t) + \beta_{17}(PRIMERATEVOL_t) \quad (1)$$

A positive value for β_1 in equation (1) would be consistent with H1.

Given that my focus is on the disclosure decisions of firms in years after an industry first-mover increases its market risk disclosure, I include only such firm-years in the levels regression. For example, Apache Corporation was the first firm in the Crude Petroleum & Natural Gas (SIC 1311) industry to disclose multiple formats, having done so in its 1999 10-K filing (see Appendix). Therefore, for this industry, the regression includes years 2000 and later for all other firms. Table 2 Panel A shows the other four industry first-movers and the years in which they first disclosed multiple formats. Following this procedure for the five industries, I obtain a sample size of 148 firms and 1,220 firm-years for the levels regression.

4.2 Changes Analysis

I also test H1 using a changes analysis to provide a stronger test of an association (O'Brien and Bhushan 1990) and eliminate firm fixed effects. Furthermore, it allows me to run lead-lag regressions to examine if changes in investor overlap lead to changes in disclosure or vice versa. First, I run a logistic regression where the dependent variable, $INCREASE_{i,t}$, is an indicator of whether firm *i* changed its year *t* 10-K filing from the prior year to include multiple quantitative formats and the independent variable of interest is the change in investor overlap from year *t-2* to *t-1* ($\Delta OVLPII_{i,t-1}$). With this specification, the change in the independent variable is measured with a one-year lag from the dependent variable.

$$P(INCREASE{=}1)_{i,t} = \beta_0 + \beta_1(\Delta OVLPII_{i,t-1}) + \beta_2(\Delta PIH_{i,t-1}) + \beta_3(\Delta OVLPAN_{i,t-1}) + \beta_4(\Delta OVLPAUD_{i,t-1}) + \beta_5(\Delta HEDGING_{i,t-1}) + \beta_6(\Delta TRADING_{i,t-1}) + \beta_7(\Delta LMV_{i,t-1}) + \beta_8(\Delta ROA_{i,t-1}) + \beta_9(\Delta DTE_{i,t-1}) + \beta_{10}(\Delta BTM_{i,t-1}) + \beta_{11}(\Delta SAR_{i,t-1}) + \beta_{12}(\Delta STOCKVOL_{i,t-1}) + \beta_{13}(\Delta STOCKLIQ_{i,t-1}) + \beta_{14}(\Delta OILPRC_{t-1}) + \beta_{15}(\Delta OILVOL_{t-1}) + \beta_{16}(\Delta PRIMERATE_{t-1}) + \beta_{17}(\Delta PRIMERATEVOL_{t-1}) \quad (2)$$

A positive value for β_1 would suggest that an increase in investor overlap in one period is associated with an increase in disclosure in the next period.

Next, I essentially reverse the dependent and independent variables and regress next year's change in investor overlap ($\Delta OVLPII_{i,t+1}$) on the indicator variable of whether the firm increased its disclosure in the current year ($INCREASE_{i,t}$).[19]

$$\Delta OVLPII_{i,t+1} = \beta_0 + \beta_1(INCREASE_{i,t}) + \beta_2(\Delta PIH_{i,t}) + \beta_3(\Delta OVLPAN_{i,t}) + \beta_4(\Delta OVLPAUD_{i,t}) + \beta_5(\Delta HEDGING_{i,t}) + \beta_6(\Delta TRADING_{i,t}) + \beta_7(\Delta LMV_{i,t}) + \beta_8(\Delta ROA_{i,t}) + \beta_9(\Delta DTE_{i,t}) + \beta_{10}(\Delta BTM_{i,t}) + \beta_{11}(\Delta SAR_{i,t}) + \beta_{12}(\Delta STOCKVOL_{i,t}) + \beta_{13}(\Delta STOCKLIQ_{i,t}) + \beta_{14}(\Delta OILPRC_t) + \beta_{15}(\Delta OILVOL_t) + \beta_{16}(\Delta PRIMERATE_t) + \beta_{17}(\Delta PRIMERATEVOL_t) \quad (3)$$

A positive value for β_1 in equation (3) would suggest that an increase in disclosure in one period is associated with an increase in investor overlap in the next period.

The changes regressions use a reduced sample size compared to the levels regressions because of the nature of the dependent variable. The indicator variable $INCREASE_{i,t}$ captures when a potential follower increases its disclosure to include multiple quantitative formats. But once a follower firm includes multiple formats and maintains that level throughout the rest of the sample period, subsequent years will no longer exhibit an increase in formats and the value of $INCREASE_{i,t}$ would remain at 0. Therefore, for such cases, I exclude those firm-years from the regression, resulting in a sample size of 148 firms and 865 firm-years.

To test the two cross-sectional predictions based on characteristics of the institutions (H2-H3), I repeat the levels and changes analyses but partition the investor overlap variable (OVLPII) by size and type of institution. To test H2, I partition

[19] I also try a specification where the dependent variable is an indicator variable for whether next year's change in investor overlap is positive. Results (not tabulated) and inferences are similar to those reported for equation (3).

investors into large and small institutions, OVLPII_LARGE and OVLPII_SMALL, respectively. Similarly, to test H3, I partition overlapping investors into overlapping dedicated institutions (OVLPII_DED), quasi-indexers (OVLPII_QIX) and transients (OVLPII_TRA).

The last hypothesis (H4) predicts that the association between investor overlap and follower firms' disclosure decisions is stronger for firms in which investors have greater uncertainty. Since investor uncertainty in a firm can vary over time, I test H4 using a changes analysis and by adding an interaction term (main effect also included) to equation (2). I interact a firm's change in investor overlap ($\Delta OVLPII_{i,t-1}$) with the indicator variable $UNCERT_{i,t}$, which is set to 1 (0 otherwise) when firm *i*'s change in annual size-adjusted return ($\Delta SAR_{i,t-1}$) is less than the sample median and the change in standard deviation of monthly size-adjusted return ($\Delta STOCKVOL_{i,t-1}$) is higher than the sample median.[20]

$$P(INCREASE=1)_{i,t} = \beta_0 + \beta_1(\Delta OVLPII_{i,t-1}) + \beta_2(\Delta PIH_{i,t-1}) + \beta_3(\Delta OVLPAN_{i,t-1}) + \beta_4(\Delta OVLPAUD_{i,t-1}) + \beta_5(\Delta HEDGING_{i,t-1}) + \beta_6(\Delta TRADING_{i,t-1}) + \beta_7(\Delta LMV_{i,t-1}) + \beta_8(\Delta ROA_{i,t-1}) + \beta_9(\Delta DTE_{i,t-1}) + \beta_{10}(\Delta BTM_{i,t-1}) + \beta_{11}(\Delta SAR_{i,t-1}) + \beta_{12}(\Delta STOCKVOL_{i,t-1}) + \beta_{13}(\Delta STOCKLIQ_{i,t-1}) + \beta_{14}(\Delta OILPRC_{t-1}) + \beta_{15}(\Delta OILVOL_{t-1}) + \beta_{16}(\Delta PRIMERATE_{t-1}) + \beta_{17}(\Delta PRIMERATEVOL_{t-1}) + \beta_{18}(UNCERT_{i,t-1}) + \beta_{19}(\Delta OVLPII_{i,t1})*(UNCERT_{i,t-1}) \quad (4)$$

H4 predicts a positive value for β_{19}.

5.0 Results

5.1 Descriptive Statistics of the Entire Sample

Table 2 Panel A presents descriptive information about the sample firms. Of the 153 firms, 43 firms are from the Crude Oil and Natural Gas industry (SIC 1311), 10

[20] Results are quantitatively similar when interaction terms using the continuous variables are used.

from Petroleum Refining (SIC 2911), 30 from National Commercial Banking (SIC 6020), 16 from Security Brokers & Dealers (SIC 6211), and 54 from Real Estate Investment Trusts (SIC 6798). I identify five firms as industry first-movers for being first to include more quantitative formats in their 10-K market risk disclosures than any other firm in their respective industries—Apache Corp., Marathon Oil, Bank of America, Morgan Stanley, and HRPT Properties. Of the remaining 148 firms that can be potential followers, 77 firms followed in subsequent years and 71 firms did not. The fact that almost half (48%) of the potential followers did not follow suggests that firms were not all simply following an industry-wide trend to increase market risk disclosures.

5.2 Descriptive Statistics of the Follower Firms

Table 2 Panel B provides further descriptive evidence of how the 77 follower firms tended to disclose the same combination of multiple formats as their industry first-movers. Three of the industry first-movers (Apache Corp., Marathon Oil, and HRPT Properties) disclosed both a tabular and sensitivity analysis, and 58 of the 77 followers (75%) also eventually disclosed the same combination of formats. Morgan Stanley was the first to include both a sensitivity analysis and value-at-risk, which was followed by 6 other firms. Finally, Bank of America was the first to include all three formats, which was followed by 10 other firms.

Panels C, D and E contain descriptive information about the two dependent variables used in the levels and changes analyses. Panel C provides a breakdown by year for the percentage of firms where MULTIPLE=1. With the exception of the first year that this variable was recorded (1998), the percentage generally increases from about 27% to 50%. For the entire sample of 1,220 firm-years used in the levels regressions, MULTIPLE equals 1 for 37% of the firm-years. For the changes analysis, the dependent variable is INCREASE, which is set to 1 (0 otherwise) in the year that firm *i* increases its market risk disclosure to include multiple formats. Of the 865 firm-years used in the changes regressions, increases occurred in 77 firm-years (9% of total firm-years). Panel D shows the fiscal years in which firms increased their disclosures were not clustered in any particular year. The highest rate of occurrences was from 2001 to 2003, with 38 increases, but the other 39 increases occurred outside of that window. Panel E shows a breakdown by industry and event year (i.e., years after the first-mover) in which follower firms increased their disclosures. Of the 77 follower firms, 23 firms (30%) followed within the first two years and 48 firms (62%) followed within the first four years.

5.3 Descriptive Statistics of Regression Variables

Table 3 provides descriptive statistics for all variables used in the levels and changes regressions. Panel A shows that the average percentage of shares outstanding owned by institutional holders (PIH) is 58%. The mean (median) number of institutional investors (NII) for a firm is 213 (146), of which 70% overlap with the industry first-mover (mean OVLPII=0.705). Most of the overlap is accounted for by large institutional investors (mean OVLPII_LARGE=0.547). In terms of the Bushee (1998, 2001) institutional investor classifications, there is on average 50% overlap of quasi-indexers, 16% overlap of transients and 2.4% overlap of dedicated investors. The median firm is covered by 9 analysts (median NAN=9), of which 2 overlaps with the industry first-mover (median OVLPAN=0.20). The reason analyst overlap is so low is that many firms lack substantial analyst coverage (e.g., the 1st quartile value of NAN is 4). Among the control variables, values for ROA, DTE, BTM, SAR, STOCKLIQ and STOCKVOL have been winsorized at the 1st and 99th percentiles.

Panel B shows that over the sample period, firms experienced an average increase in total institutional ownership (ΔPIH) of 3.1% per year. The average increase in overlapping ownership was 1.1% per year, of which 0.7% came from large institutions and 0.4% from small institutions. The average change in overlapping dedicated and quasi-indexer institutions is close to zero, which is not surprising since such investors tend not to trade in and out of stocks. The average change in overlapping transient institutional investors is about 0.7%.

Panel C shows the correlations of the levels variables and Panel D shows the correlations of the change variables.[21] The main variables of interest, overlap in institutional investors (OVLPII) and its year-to-year change (ΔOVLPII), are not highly correlated with any other variables.[22] OVLPII has a correlation (Pearson) of -0.35 with total institutional ownership (PIH) and 0.25 with overlap in sell-side analysts (OVLPAN). ΔOVLPII has a correlation of -0.22 with the change in log of market value (ΔLMV).

---

[21] To keep the correlation tables to a manageable size, I omit the oil price level and volatility variables (LNOILPRC and OILVOL) and the interest rate level and volatility variables (PRIMERATE and PRIMERATEVOL). Pair-wise correlations of these variables with the variable of interest (OVLPII) do not exceed |0.15|.

[22] All the correlations with OVLPII and ΔOVLPII shown in Panels C and D of Table 2 are statistically significant at the 10% level or lower, with the exceptions of log of market value (LMV) and the change in standard deviation of monthly size-adjusted returns (ΔSTOCKVOL).

5.4 Results of Testing Hypothesis 1

The results of testing H1 using a levels analysis are presented in Table 4 Panel A. The first column shows the results when only the control variables are included; standard errors are clustered by firm (Rogers 1993). Firms with higher return-on-assets (ROA), book-to-market (BTM) and size-adjusted returns (SAR) are less likely to include multiple quantitative formats in their market risk disclosures. Conversely, firms with higher log of market values (LMV) and firms that use derivatives for trading purposes (TRADING=1) are more likely to include multiple formats. Among industry factors, higher oil prices (LNOILPRC) and lower interest rates (PRIMERATE) are associated with a firm's use of multiple formats. The coefficients for a firm's total institutional ownership (PIH) and overlap in sell-side analyst coverage (OVLPAN) are not significant. Interestingly, firms that use the same auditors (OVLPAUD) as the first-mover tend not to disclose multiple formats, perhaps due to heightened concerns about revealing market risk information when a competing firm is headquartered within close proximity.[23]

The second column shows the results when a firm's investor overlap (OVLPII) with the industry first-mover is included in the regression. The coefficient on OVLPII is positive and significant at the 1% level (p-value=0.0001), consistent with H1.[24] To assess the model's goodness of fit, I compute a hit ratio of 72.5%, defined as the number

---

[23] Out of the 57 observations in which OVLPAUD=1, roughly a quarter involved Arthur Andersen (prior to 2002) from the Houston office. Omitting these observations from the analysis does not change the main results.

[24] To check for industry effects, I run the levels regressions on the sample of energy and financial firms separately. I find that the coefficients for investor overlap (OVLPII) remain significantly positive in each regression, but only at the 10% level, likely due to the loss of statistical power.

of correctly predicted instances of MULTIPLE=0 (572) and MULTIPLE=1 (312), divided by total observations (1,220).[25] To assess the economic significance of the result, the far-right column shows each variable's mean marginal effect multiplied by its inter-quartile range (for the dummy variables, the value changes from 0 to 1). A firm with 84% investor overlap (3rd quartile value) has a 17.8% higher probability of disclosing multiple formats than a firm with 58% investor overlap (1st quartile).

The results from the changes analysis are shown in Panels B and C. Panel B shows that for the first lead-lag regression (equation 2), the coefficient for lagged change in investor overlap ($\Delta OVLPII_{t-1}$) is positive and significant (p-value=0.020). Among the controls, increases in firm size (ΔLMV_{t-1}), debt-to-equity (ΔDTE_{t-1}), and decreases in interest rates ($\Delta PRIMERATE_{t-1}$) are also associated with a follower firm's decision to change to multiple formats. Panel C shows that for the second lead-lag regression (equation 3), the coefficient on $INCREASE_t$ is not significant. This lack of significance is in fact consistent with my hypothesis that investor overlap is a mechanism for future disclosure changes but not vice versa. Overall, the results from the levels and changes analyses support the first hypothesis that a firm's decision to follow a first-mover's commitment to provide greater disclosure is positively associated with investor overlap.[26]

[25] In computing the hit ratio, a firm-year is classified as $MULTIPLE_{i,t}$ =1 (0 otherwise) if the predicted value exceeded the cutoff of 0.369, which is the probability that MULTIPLE=1 in the sample (450/1,220). A benchmark hit ratio is 46.9% (572/1220).

[26] In untabulated results, a logistic regression of $INCREASE_t$ on contemporaneous changes in investor overlap ($\Delta OVLPII_t$) yields a negative but insignificant coefficient (p-value=0.52).

5.5 Results of Cross-Sectional Tests (H2-H4)

Table 5 shows the results when investor overlap is partitioned by large and small institutions. Panel A presents the results of the levels regression, which shows that the coefficient for OVLPII_LARGE is positive and significant at the 1% level (p-value=0.0001) while the coefficient for OVLPII_SMALL is not significant (p-value=0.173) at conventional levels.[27] Panel B shows that when the regression is performed in changes, the coefficient for ΔOVLPII_LARGE is significantly positive (p-value=0.027) and the coefficient for ΔOVLPII_SMALL is not significant (p-value=0.204). Results from both analyses support H2 in that overlap in large institutional investors, who have the greatest ability to influence managers, shows the most significant association with a firm's decision to follow a first-mover.

Table 6 shows the results when investor overlap is partitioned by overlapping dedicated (OVLPII_DED), quasi-indexer (OVLPI_QIX) and transient (OVLPII_TRA) institutional investors. The levels analysis presented in Panel A shows that overlap in each class of institution has a significantly positive coefficient, contrary to the prediction that overlap among quasi-indexers and transients have the strongest associations with a firm's disclosure decision. However, the results of the changes regression in Panel B show that only the coefficients for ΔOVLPII_QIX (p-value=0.039) and ΔOVLPII_TRA (p-value=0.073) are significantly positive, whereas the coefficient for ΔOVLPII_DED is not significant at conventional levels (p-value=0.229). The latter result is consistent with H3 in that overlap among investors with the greatest incentives to demand

[27] In untabulated results, a test for differences in the coefficients yields a p-value of 0.26. When I partition large institutions to only include the top decile, a test for differences in the coefficients yields a p-value of 0.10.

disclosure has a stronger association with a follower's increase in disclosure. However, one caveat is that the lack of significance for changes in overlapping dedicated institutions could also be due to their infrequent trading, which lowers the variation in the ΔOVLPII_DED variable and its statistical power.

Finally, Table 7 presents the results of estimating regression equation (4), which provides cross-sectional analysis based on firm-level uncertainty. As predicted, the coefficient for the interaction of change in investor overlap and the indicator UNCERT $(\Delta OVLPII_{i,t-1})*(UNCERT_{i,t-1})$ is significantly positive (p-value=0.028). Overall, the results of Table 7 support the hypothesis that overlapping investors are more likely to pressure firms with greater uncertainty into following a first-mover's commitment to greater disclosure.

6.0 Additional Analyses

6.1 Examining Changes in Institutional Ownership Based on Disclosure Choice

The development of hypothesis 1 is based on the assumption that institutional investors can implicitly or explicitly threaten to sell shares or not purchase additional shares in a firm if they are dissatisfied with its market risk disclosures (conditional on the industry first-mover's increased level of disclosure). In this section I test this assumption by examining institutions' share of ownership in each potential follower firm before and after its 10-K filing and partitioning on whether the firm followed the first-mover in increasing the number of quantitative formats. If firms benefit from following the first-mover, then I expect the change in ownership for followers to be greater (more positive) than for non-followers.

I define $PCTOWN_{j,i,t-1}$ as the percentage of ownership (shares owned divided by total shares outstanding) that institutional investor *j* has in firm *i* at the end of calendar quarter *t-1*. I then compute $DPCTOWN_{j,i,t}$ as the difference in percentage ownership from calendar quarter *t-1* to *t*. For example, A.G. Edwards' 1998 10-K was filed May 29, 1998, so I compute the change in percentage ownership from March 31, 1998 to June 30, 1998 for all institutions invested in that firm. I then examine if the mean $DPCTOWN_{INCREASE=1}$ for all firm-years in which a firm increased its market risk disclosure is different from the mean $DPCTOWN_{INCREASE=0}$ in which a firm did not increase its disclosure. Similarly, I define DNINST as the difference in the number of institutional (NINST) owners between quarters and examine whether that difference is more or less for followers and non-followers.

The results of the difference-in-difference tests are shown in Table 8. For the 77 firm-years in which INCREASE=1, the mean DNINST is 4.9 and the mean DPCTOWN is 0.021%. For the 785 firm-years in which INCREASE=0, the mean DNINST is also 4.9 and the mean DPCTOWN is 0.004%. Tests for differences in means between the two groups shows no significant difference in mean DNINST, but there is a difference in the mean DPCTOWN (p-value=0.0886). The difference-in-difference of 0.017% (0.021% - 0.004%) translates into roughly 26,180 more shares owned by each institutional investor in the quarter immediately after an increase in market risk disclosure, based on average shares outstanding of 154 million for the sample firms. Thus, while there is no evidence that firms that follow the industry first mover gain more institutional investors than non-followers, there is some evidence that institutional investors increase their average ownership in firms that follow the first-mover.

6.2 Distinguishing the Institutional Overlap Effect from the Herding Effect

As mentioned in the introduction, prior papers examining "follow-the-leader" patterns of accounting or disclosure choice have focused on the effect of herding (Brown et al. 2006; Tse and Tucker 2010) among firms when making disclosure decisions. Their empirical tests generally focus on a variable that measures the number or proportion of firms in the same industry (as firm *i*) that have changed their disclosure decisions prior to period *t*. Therefore, to examine if there is a herding effect within my disclosure setting and to help distinguish it from the effect of demand pressure from overlapping institutional investors, I re-run the main tests but include an additional variable to control for the potential effect of herding. $LPRIOR_{i,t}$ is measured as the log of the number of firms in the same industry (as firm *i*) that have changed to multiple formats in a prior year. If a potential follower firm is more likely to increase its market risk disclosure when more firms in the same industry have already done so, then LPRIOR should have a positive coefficient in the main levels and changes regressions.

Table 9 Panel A shows the results when LPRIOR is included in the main levels regression. The coefficient on LPRIOR is positive and significant (p-value=<.0001), which suggests a positive herding effect among the sample firms. Importantly, the inclusion of LPRIOR in the regression does not dramatically lower the coefficient for OVLPII (3.113 compared with 3.894 in Table 4A), nor does it affect its significance at the 1% level. Panel B shows the results when LPRIOR is included in the main changes regression. Once again, the coefficient is positive and significant (p-value=0.055), while the coefficient for change in overlap ($\Delta OVLPII_{t-1}$) remains significantly positive (and similar in magnitude as in Table 4B). Overall, the results from Table 9 indicate that the association between overlap in institutional ownership with a firm's decision to follow an industry first-mover is incremental to a herding effect among the firms.

6.3 Examining the Potential Influence of the Second-Movers

The empirical tests in this paper thus far have used a measure of overlap in institutional ownership between a firm and the industry first-mover. However, it may be the case that overlap in ownership with another firm, such as the second-mover, could also be associated with a firm's decision to increase its market risk disclosure. To examine this possibility, I repeat the main tests using overlap in institutional investors with the industry second-mover (OVLPII_SEC). Running this test also provides an indication of whether the associations shown in this paper are stronger when conditioning on the first- or second-mover.

However, such a test requires two notable changes to the sample. First, there is not always a unique second-mover because several firms may have followed the first-mover in the same year. In such cases, I select the firm with the larger market capitalization as the second-mover based on the assumption that the actions of larger firms are more influential for the rest of the industry than smaller firms. Thus, the five identified industry second-movers are Nexen (SIC 1311), Amerada Hess (SIC 2911), Citigroup (SIC 6020), E*Trade Financial (SIC 6211) and Boston Properties (SIC 6799). Second, conditioning on five industry second-movers reduces the number of potential followers by five firms and the number of firm-years in the levels (changes) regression from 1,220 to 1,001 (865 to 687) because there are fewer years following a second-mover's actions than a first-mover's actions in the sample period. Therefore, there is less power when repeating the main tests using overlap with the industry second-movers.

The results of a levels regression using the alternative overlap measure are shown in Table 10 Panel A. The first column shows that the coefficient on $OVLPII\_SEC_t$ is positive and significant (p-value = 0.029), however, it is much smaller in magnitude than the coefficient when overlap is measured relative to the first-mover ($OVLPII_t$ in Table 4 Panel A). To assess whether the weaker association is due to less influence of the second-mover or simply lower power, I include both measures of overlap, $OVLPII_t$ and $OVLPII\_SEC_t$, in the same regression. The second column shows that $OVLPII_t$ is positive and significant (and similar in magnitude as in Table 4A), while $OVLPII\_SEC_t$ is no longer significant (p-value=0.195). Similar results are found in the changes regression, presented in Panel B. The first column shows that $\Delta OVLPII\_SEC_{t-1}$ is not significant and the second column shows that $\Delta OVLPII_{t-1}$ is positive and significant, similar to the result in Table 4B. Overall, the results from this section indicate that overlap in ownership with the industry second-mover does not provide any incremental association with a firm's decision to follow the first-mover.

6.4 Partitioning Institutions by Size and Type

In testing H2, I partitioned overlap in institutional investors (OVLPII) by the size of the institution (large or small) and found evidence that overlap in large institutions drives the positive association found from testing H1. Similarly, in testing H3, I partitioned overlap by the type of institution (dedicated, quasi-indexer, or transient) and found evidence that overlap in quasi-indexers and transients drives the positive association. However, each test may not be independent because large institutional investors may also proxy for investors that are quasi-indexer and/or transient. Therefore, in this section, I partition overlap by both size and type of institution, resulting in six mutually exclusive groups of overlapping institutional investors: large and dedicated (OVLPII_LARGE_DED), large and quasi-indexer (OVLPII_LARGE_QIX), large and transient (OVLPII_LARGE_TRA), small and dedicated (OVLPII_SMALL_DED), small and quasi-indexer (OVLPII_SMALL_QIX), and small and transient (OVLPII_SMALL_TRA). I re-run the main levels and changes regressions with the inclusion of all six overlap variables to examine which group(s) drives the positive association found from testing H1.

The results of the levels regression with all six overlap variables are presented in Table 11 Panel A. Consistent with H2, which states that overlap in large institutional investors, relative to overlap in small institutional investors, has a stronger association with a firm's decision to follow an industry first-mover, the coefficients for OVLPII_LARGE_DED, OVLPII_LARGE_QIX and OVLPII_LARGE_TRA are positive and significant. In contrast, the coefficients for OVLPII_SMALL_DED, OVLPII_SMALL_QIX and OVLPII_SMALL_TRA are not significant. Panel B presents the results of the changes regression. The coefficient with strongest statistical significance is ΔOVLPII_LARGE_QIX$_{t-1}$ (p-value=0.015), followed by ΔOVLPII_LARGE_TRA$_{t-1}$ (p-value=0.056) and ΔOVLPII_LARGE_DED$_{t-1}$ (p-value=0.093). Again, the coefficients with the small group of institutions are not significant. These results are consistent with H3, which states that overlap in quasi-indexer and transient investors, relative to overlap in dedicated investors, has a stronger association with a firm's decision to follow an industry first-mover's commitment to greater disclosure.

6.5 Examining Potential Changes in Firms' Derivatives Use

An alternative explanation for a firm's decision to include multiple quantitative formats in its 10-K market risk disclosure is that it has increased its use of derivatives during the year, which calls for greater disclosure about them. While the main tests include two indicator variables for whether a firm uses derivatives for hedging and/or trading purposes during a year, these variables do not capture a firm's increase in derivatives use for either purpose during a year. To examine this alternative explanation, I conduct a market-based test to see if firms' stock return sensitivities to changes in either oil prices (for energy firms) or interest rates (for financial firms) are different depending on whether they disclose a single or multiple quantitative formats. If firms increase risk hedging behavior during a year, then the firms' stock return sensitivities to the industry factor should be lower in years where multiple formats are disclosed. If firms increase speculative behavior, then the sensitivities to the industry factor should be higher. Finally, if firms are not changing their risk behavior significantly between years in which a single or multiple formats are disclosed, then the sensitivities should not change.

For firms in the Crude Petroleum and Natural Gas (SIC 1311) and Petroleum Refining (SIC 2911) industries, I regress firms' monthly stock returns ($R_{i,t}$) on the monthly returns of the CRSP equal-weighted index (Rm_t), the monthly returns on oil prices (Ro_t), and the interaction of Ro_t with an indicator variable ($MULTIPLE_{i,t}$) set to 1 (0 otherwise) for the months within a firm's fiscal year that includes multiple quantitative formats in the 10-K. I run a pooled regression of the following equation: $R_{i,t} = \beta_0 + \beta_1 Rm_t + \beta_2 Ro_t + \beta_3 MULTIPLE_{i,t} * Ro_t$. Similarly, for firms in the Banking (SIC 6020), Brokerage (SIC 6211) and Real Estate (SIC 6798) industries, I estimate $R_{i,t} = \gamma_0 + \gamma_1 Rm_t + \gamma_2 \Delta Rf_t + \gamma_3 MULTIPLE_{i,t} * \Delta Rf_t$, where ΔRf_t is the monthly percentage change in the 3-month Treasury Bill rate. If the alternative explanations are true, then the coefficients on the interaction terms, β_3 and γ_3, should be significantly different from zero. The results in Table 12 Panels A and B show that the coefficients are negative but not statistically significant (p-values above 0.40), which suggests that the risk taking behavior of firms are not significantly different between years in which a single or multiple formats are disclosed.

6.6 Instrumental Variables Approach

I use an instrumental variables (IV) approach to address potential endogeneity of overlap in institutional ownership (OVLPII) between a given firm and an industry first-mover. Endogeneity may arise because of unobservable confounding factors (i.e., correlated omitted variables) that affect the number of institutional investors who invest in two particular firms and also affect the market risk disclosure decisions of those two firms. For example, changes in investor sentiment might cause firms within an industry to gain or lose institutional investors and also influence managers' disclosure decisions. This source of endogeneity can bias the estimated coefficients in the main regressions. While there may be other sources of endogeneity (e.g., measurement error and simultaneity), the IV approach does not require that the exact source(s) be known to provide a general solution to the problem of an endogenous explanatory variable (Wooldridge 2001). Therefore, as a robustness check, I conduct a two-stage analysis where I repeat the levels and changes regressions using fitted values of investor overlap.

My instrumental variables in the first stage regression are the measured differences in stock return, volatility, and liquidity between a given firm and its industry first-mover. For example, I measure the difference in annual size-adjusted returns as $DSAR_{i,t} = SAR_{i,t} - SAR_{first\text{-}mover,t.}$ Similarly, I define the differences in each firm's idiosyncratic stock volatility ($DSTOCKVOL_{i,t}$) and liquidity ($DSTOCKLIQ_{i,t}$). I expect these variables to be negatively correlated with the level of investor overlap (OVLPII) between two firms because institutions tend to invest in stocks with similar characteristics (O'Brien and Bhushan 1990; Gompers and Metric 2001). At the same time, I do not believe these variables should be correlated with a firm's decision to increase the number of quantitative formats in its 10-K market risk disclosure, other than through overlap in institutional ownership. The last instrument I include is a measure of equity fund flows into the fund industry. I define $EQFUNDFLOWS\_CHG_t$ as the ratio of equity fund flows for the year divided by total equity assets at the beginning of the year, based on data from the *National Association of U.S. Investment Companies.*

In the first stage, I regress a firm's investor overlap with its industry first-mover ($OVLPII_{i,t}$) on all the instruments and covariates from regression equation (1). The R-squares from the first-stage regressions for each of the five industries range from 0.33 to 0.84. In the second stage, I obtain the fitted values of overlap ($OVLPII\_HAT_{i,t}$) and re-run the levels and changes regressions of equations (1) and (2). The results are reported in Table 13; standard errors have been adjusted to account for the fact that OVLPII_HAT has been estimated from the data. Panel A shows that the coefficient for $OVLPII\_HAT_t$ is significantly positive and larger in magnitude than the coefficient in Table 4 Panel A (4.9 vs. 3.9), suggesting the latter was biased downward.[28] Panel B shows that the coefficient for $\Delta OVLPII\_HAT_{t-1}$ is significantly positive and smaller in magnitude than the coefficient in Table 4 Panel B (3.2 vs. 4.4), suggesting the latter was biased upward. Nonetheless, the results from the two-stage analyses are consistent with H1.

6.7 Hazard Model

As an alternative framework to test the effect of investor overlap on firms' disclosure decisions, I conduct a duration analysis, or hazard model, to model the time it takes for a firm to follow the first-mover (if ever). Hazard models have been used in prior accounting studies to model the time before a firm issues an earnings warning (Tse and Tucker 2010) or a capital expenditure forecast (Brown et al. 2006), and before an employee exercises stock options (Armstrong et al. 2007). However, unlike the prior

[28] To test the endogeneity/exogeneity of the level of investor overlap (OVLPII), I take the residuals from the first-stage regression and include them in the original levels regression (equation 1). The coefficient on the residuals is significantly negative (p-value=0.016), which suggests some endogeneity (Smith and Blundell 1986)..

papers, time in my setting is discrete in the sense that 10-K filings are issued once a year, which makes estimating a hazard model analogous to the logistic regressions in the main tests (Cox 1972). Nonetheless, estimating a hazard model could yield additional insight on the effect of various covariates because, unlike the logistic regressions, the hazard model does not assume a specific parametric distribution for the baseline hazard function or the error term.

I estimate a semi-parametric, discrete-time Cox proportional hazard model. The hazard rate is the conditional probability that a firm will increase disclosure in year *t* given that it has not done so already in prior years. Time is measured in number of years ($TIME_{i,t}$) and the hazard rate function is given by: $h(t;\mathbf{x})/(1-h(t;\mathbf{x})) = h_0(t)/(1-h_0(t))\exp(\boldsymbol{\beta}'\mathbf{x}(t))$, where $h_0(t)$ is an unspecified baseline hazard function, $\mathbf{x}(t)$ is a vector of time-varying observable covariates, and $\boldsymbol{\beta}$ is a vector of unknown regression parameters. The baseline hazard function is the common probability that a firm will increase its disclosure given that all explanatory variables are equal to zero. If an increase in investor overlap has a positive effect on the hazard rate, then the parameter estimate for investor overlap will be positive.

Since I model the time to a change in disclosure, I estimate the hazard model using variables measured in changes, consistent with the variables used in the logistic regression of equation (2). The results of the estimation are presented in Table 14; standard errors are based on the robust sandwich covariance matrix of Lin and Wei (1989) that is robust to model mis-specification. Panel A shows descriptive statistics of the dependent variable $TIME_t$. On average, the 77 firms that eventually followed the first-mover did so 4.1 years after the industry first-mover (consistent with the descriptive statistics presented in Table 2E). Panel B shows that the coefficient for investor overlap ($\Delta OVLPII_{t-1}$) is significantly positive and similar in magnitude to the coefficient in Table 4 Panel B, indicating an increase in investor overlap increases the conditional probability that a firm will follow the first-mover. The hazard estimation results also show that, in addition to firm size (ΔLMV_{t-1}) and debt-to-equity (ΔDTE_{t-1}), increases in the volatility of oil prices ($\Delta OILVOL_{t-1}$), interest rates ($\Delta PRIMERATEVOL_{t-1}$), a firm's stock ($\Delta STOCKVOL_{t-1}$), and declines in interest rate levels ($\Delta PRIMERATE_{t-1}$) increase the hazard rate.

7.0 Additional Discussion on Market Risk Disclosures

7.1 The Evolution of Market Risk Disclosures and Extant Literature

In the early 1990's, a wave of companies reporting highly publicized derivative losses (e.g., Proctor & Gamble, Gibson Greetings, Metallgesellschaft AG), led to a call from investors, creditors and regulators for improvement in the financial reporting and disclosure of companies' risk exposures and use of derivatives. In October 1994, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards No. 119 (SFAS 119), Disclosure about Derivative Financial Instruments and Fair Value of Financial Instruments. The new rule increased the general level of disclosure about derivatives, but researchers and regulators still felt there was insufficient quantitative information about market risk and how the effects of derivatives flowed through the financial statements (Herz et al. 1996).

To address this problem, in January 1997 the Securities and Exchange Commission (SEC) issued Financial Reporting Release No. 48 (FRR No. 48), which required companies to disclose qualitative and quantitative information about market risk. Market risk is defined as risk to earnings, cash flows, or fair values arising from fluctuations in foreign exchange rate, interest rates, commodity prices and equity prices. Companies are required to use one of three quantitative formats—a tabular presentation, sensitivity analysis, or value-at-risk estimate—to disclose how market risk can affect earnings, cash flow, or fair values of financial instruments. The flexibility was intended to give each company the discretion to disclose its market risk exposure in a manner consistent with internal reporting.

Since then, a number of studies have examined the effectiveness of the market risk disclosures and whether or not investors find them useful. A year after the SEC rule came into effect, a survey by Roulstone (1999) indicated that market risk disclosures improved greatly under FRR No. 48, but there was significant room for improvement as the disclosures varied widely in detail and clarity. An internal staff report by the SEC made similar conclusions (SEC Staff Report 1998). Even before a sufficient time-series of market risk disclosures was available, a number of academic studies used proxies for FRR No. 48 disclosures to provide early evidence that the disclosures were useful to investors in certain industries, such as the oil and gas industry (Rajgopal 1999) and commercial banking industry (Ahmed et al. 2000). Later studies examining actual FRR No. 48 disclosures also concluded that they were useful to investors in reducing uncertainty (Linsmeier et al. 2002) and predicting future revenue (Jorion 2002; Liu et al. 2004).

However, market risk disclosures appear to be more important in certain industries, such as those in which market risk is highly correlated with operating risk. Accordingly, to increase statistical power, many of the above-mentioned studies (with the exception of Linsmeier et al. (2002)) used a sample of firms in the energy or financial industries, where operations are greatly affected by commodity prices and interest rates, respectively. Guay and Kothari (2003) question whether the magnitude of derivative use is economically significant and find that derivative use is modest for a broad sample of large firms. As a result, this paper uses a sample of firms in which market risk is expected to be highly correlated with operating risk to ensure that the disclosures are important to investors and other stakeholders.

7.2 The Use of Market Risk Disclosures by Investors

The methods by which institutional investors use market risk disclosures to analyze and value firms depend upon many factors, including but not limited to: i) the type of firm (e.g., financial, energy and multi-national); ii) the specific operations of the firm (e.g., lending, trading, commodity production, etc.); iii) the type of quantitative information disclosed by the firm (tabular, sensitivity, value-at-risk); and iv) the amount of quantitative information disclosed (one format or multiple formats). While a full discussion for all the possible scenarios is beyond the scope of this paper, I provide an overview of the methods that investors can use disclosures specifically about interest rate risk to help analyze financial firms and disclosures about commodity price risk to help analyze energy firms.

A textbook approach to valuing a financial firm is to analyze its portfolio of financial instruments carried on the balance sheet at fair value, as well as to analyze its future stream of net interest earnings from financial operations on a discounted cash flow basis (Ryan 2007, 16-17). Within this framework, information disclosed in the tabular format can be used to estimate the duration of the firm's portfolio of financial instruments and a firm's re-pricing gap (interest-earning assets due to be re-priced minus interest-paying liabilities due to be re-priced) at different time intervals. The investor can then assess the expected changes in fair values of financial instruments and changes in net interest earnings based on possible changes in the level, slope and shape of the yield curve, although the investor would need to make some simplifying assumptions about the timing of fixed-rate coupon payments and floating-rate re-pricing schedules (among other assumptions). Information disclosed in a sensitivity analysis already incorporates these assumptions from management (which are usually more accurate than the investor's assumptions) and often provides the assessment of value or earnings change in a simple and concise manner, typically for only a limited (one or two) number of interest rate scenarios. Information disclosed in a value-at-risk incorporates the covariances of different classes of assets and liabilities and provides an estimate of one particular bad-case scenario over a specific time period and with a specific probability of occurrence. In summary, information contained in each format is complementary and gives an investor a more precise assessment of the potential impact on fair values and net interest earnings for a financial firm from realizations of future interest rate moves.

For energy firms, the information contained in a commodity price risk disclosure provides the investor an estimate of how revenues or earnings may change given a change in oil and gas spot prices. For example, information about commodity derivatives (e.g. notional amounts, maturities and average strike prices) disclosed in the tabular format can be used by an investor to estimate the proportion of the firm's production that is hedged at different time intervals and at different strike prices. The investor can then assess potential gains and losses from derivative contracts, which often flow through the firm's top or bottom line, based on hypothetical or realized changes in commodity prices. Similarly, the firm may summarize such an assessment of their derivative positions or even production revenues in a sensitivity analysis for a limited number of commodity price scenarios. Information disclosed in a value-at-risk estimate incorporates the covariances of price movements for different classes of commodities for firms with several energy businesses and/or trading operations. Overall, the commodity price risk disclosures provide an investor with a more precise assessment of how sensitive the firm's revenues or earnings are to fluctuations in energy prices.

8.0 Literature Review on Institutional Investors

8.1 The Growth in Institutional Ownership

Institutional investors own the majority of U.S. corporate equities (compared with individual investors), and their percentage ownership has steadily increased over the past several decades. According to the Federal Reserve's Flow of Funds report, institutional ownership first surpassed 50% in 1996 and that percentage has increased to 64% in 2008. The shift appears even more dramatic when one considers that in the 1950's, individual households owned over 90% of U.S. stocks. Today, the largest institutions include mutual funds, private pension funds, public retirement funds, and insurance companies. Not surprisingly, survey evidence shows that corporate CFOs consider institutions as their most important investors (Graham et al. 2005).

This changing composition of U.S. stock ownership has prompted much academic research on the determinants and effects of institutional ownership. The common perception of institutions is that they are more sophisticated and informed than individual investors (O'Brien and Bhushan 1990; Walther 1997), and thus, their growing importance has implications for capital allocation, corporate governance, stock market volatility, and even information intermediaries such as sell-side analysts.

8.2 The Determinants of Institutional Ownership

Early studies on the determinants of institutional ownership hypothesized that institutions prefer stocks with certain characteristics related to firm size, visibility, and trading liquidity. O'Brien and Bhushan (1990) found that institutions tend to own stocks in large companies and companies with higher analyst following, and they believe that prudence laws help explain institutions' preference for such firms. Del Gercio (1996) also finds that fiduciary duty and legal liability influence the preference of banks to invest in companies that are viewed as "prudent" stocks. Falkenstein (1996) examines the holdings of open-end mutual funds and finds they prefer stocks with high visibility, information flow, and volatility. He posits that fund managers may be trying to invest in stocks with the potential for large price movements in order to outperform passive index funds and benchmarks. Later studies that examine larger samples of institutions consistently find that ownership is positively associated with firm size, stock liquidity, and visibility (Gompers and Metrick 2001; Bushee 2001). Bushee and Miller (2009) examine smaller firms that lack the typical characteristics preferred by institutions and find that such firms who increase investor relations activities can increase their visibility and ownership among institutional investors.

After controlling for the above-mentioned stock characteristics, other studies examine how institutional ownership is associated with firms' quality of accounting information and disclosures. Firms with higher disclosure quality have greater institutional ownership (Healy et al. 1999; Bushee and Noe 2001) and firms that adopt accounting conventions that are familiar to investors and/or considered higher quality (such as U.S. or International GAAP) have higher ownership among U.S. (Bradshaw et al. 2004) and foreign institutional investors (Covrig et al. 2007). The findings from this stream of research suggest that a firm's accounting and disclosure choices can affect its level of institutional ownership.

8.3 Institutional Investors and Corporate Governance

In contrast, a large literature in corporate governance indicates that institutional investors can influence a firm's accounting and disclosure choices. Early theoretical work suggests that institutions with the largest stakes and longer investment horizons have the greatest incentive and ability to influence firm managers and directors (Schleifer and Vishny 1986; Kahn and Winton 1998; Bolton and Von Thadden 1998). Many empirical studies have found results to be consistent with this notion.

Researchers have examined a number of mechanisms by which institutions can explicitly or implicitly monitor management and affect firm behavior. The shareholder activism literature shows that institutions with large stakes can directly affect governance issues through communications with management and/or threats of proxy contests (Smith 1996; Carleton et al. 1998). However, institutions can also influence firm behavior implicitly through their decisions to buy and sell a firm's stock. Prior studies have found that changes in institutional ownership are associated with changes in firm management (Parrino et al. 2003), executive compensation (Hartzell and Starks 2003), and M&A activity (Gaspar et al. 2005; Chen et al. 2007). Furthermore, the earnings guidance literature has shown that institutional ownership is associated with more frequent, precise and disaggregated management forecasts (Ajinkya et al. 2005;

Lansford et al. 2009). These studies argue that the increased voluntary disclosures are a response by management to increased demand for information by institutional investors.

8.4 The Effect of Overlap in Institutional Ownership of Firms

While the effects of *total* institutional ownership have been studied, the effect of *overlap* in institutional ownership of firms, either on the behavior of firm managers or institutional investors, has largely been unexplored in the prior literature. To the best of my knowledge, there are two published papers that empirically examine the effects of cross-ownership (i.e. overlap) in firms. In the area of corporate policy, Hansen and Lott (1996) focus on externalities between two firms and theorize that investors who own shares in both firms do not want each firm to pursue individual firm maximization as its corporate objective, but rather, portfolio maximization. That is, when a firm's value depends upon another's actions as well as on its own actions, investors who own both firms want each firm to internalize the externalities in their policy decisions. Examples of inter-firm externalities include actions taken by competing firms, vertically integrated firms, or firms engaged in legal litigation against each other. The authors empirically test an argument put forth in the legal literature (Easterbrook and Fischel 1982) that in corporate control transactions, investors who own shares of both the acquirer and target firm care about the total gain of the transaction, not how the gain is allocated. Thus, the price an acquirer is willing to pay for a target should be positively associated with the overlap in ownership between the two firms. They find evidence consistent with their prediction that acquirers, on average, pay more for public firms than private firms because there is greater likelihood of common ownership. Even in their restricted sample in which both the acquirer and target are public, there is evidence that greater cross-ownership leads the acquirer to pay more for the target firm.

Also in a setting with firm externalities, Cohen and Frazzini (2008) use a sample of customer-supplier firm pairs and examine how a news shock to a customer firm's stock price eventually translates into a shock to a supplier firm's stock price. They test the hypothesis that *some* investors are inattentive to such links, leading to slow diffusion of value-relevant news and predictable returns for supplier firm stocks. Importantly, they hypothesize and test that the inattention varies with the common ownership between the two firms. Their results indicate that when there is greater overlap in ownership between customer and supplier, shocks to the customer's stock get impounded into the supplier's stock more quickly.

Despite the lack of attention in the literature on the effects of overlap in ownership, the above-mentioned papers underscore two important notions related to the hypothesis development of this paper. First, managerial decisions about corporate policy can depend on both the decisions of other firms and on the overlap in ownership with those other firms. In that vein, the specific research question examined in this paper is whether one firm's decision to adopt the disclosure practice of another firm is associated with their overlap in ownership. Second, the assumption that an investor may overlook a value-relevant disclosure contained in a firm's 10-K filing if he or she is not a current shareholder is not new or unlikely. Cohen and Frazzini (2008) collect information about customer-supplier relationships from 10-K filings and show evidence that such information is more likely to be overlooked by non-overlapping investors. Similarly, in this paper, I collect information about market risk for a sample of firms whose core operations are subject to substantial market risk, and I argue that year-to-year changes in these disclosures are internalized more by current shareholders than investors without a stake in the firm.

9.0 Conclusion

This paper examines how one firm's commitment to provide more public disclosure affects other firms' disclosure practices in subsequent periods. To the best of my knowledge, this paper is the first to hypothesize and empirically show that overlap in institutional ownership between two firms is associated with a firm's disclosure behavior (i.e., in this setting, to adopt another firm's disclosure innovation). My test of a demand-driven explanation for why firms change disclosures provides evidence that institutional investors exert pressure on firms to disclose information, which contributes to prior work that suggests firms provide information in anticipation of investor demand. This evidence also provides new insight into patterns of intra-industry disclosure behavior and a better understanding of how one firm's commitment to greater disclosure can affect investors' perceptions of other firms. My focus on overlap in institutional ownership highlights a new way to partition firms' institutional investor bases, and importantly, a new source of variation in firms' information environments that can be used in future research to examine variation in information transfers, return co-movements, and other capital market effects between pairs of firms.

References

Abramowitz, P. 2006 (Nov.). "The Best of the Buy Side." Institutional Investor. 42-50.

Ahmed, A.S., A. Beatty, and B. Bettinghaus. 2004. "Evidence on the efficacy of interest-rate risk disclosures by commercial banks." The International Journal of Accounting, 39: 223-251.

Ajinkya, B., S. Bhojraj, and P. Sengupta. 2005. "The Association between Outside Directors, Institutional Investors and the Properties of Management Earnings Forecasts." Journal of Accounting Research, Vol. 43, No. 43: 343-376.

Armstrong, C.S., A.D. Jagolinzer, and D.F. Larcker. 2007. "Timing of Employee Stock Option Exercises and the Cost of Stock Option Grants." Working Paper, Stanford University and University of Pennsylvania.

Ahmed, A.S., A. Beatty, and B. Bettinghaus. 2004. "Evidence on the efficacy of interest-rate risk disclosures by commercial banks." The International Journal of Accounting, Vol. 39, No. 3: 223-251.

Bradshaw, M.T., B.J. Bushee, and G.S. Miller. 2004. "Accounting Choice, Home Bias, and U.S. Investment in Non-U.S. Firms." Journal of Accounting Research, Vol. 42, No. 5: 795-841.

Bolton, P., and E. Von Thadden. 1998. "Blocks, Liquidity, and Corporate Control." The Journal of Finance, Vol. 53, No. 1: 1-25.

Brennan, M.J., and C. Tamarowski. 2000. "Investor Relations, Liquidity, and Stock Prices." Journal of Applied Corporate Finance, Vol. 12, No. 4: 26-37.

Brown, N.C., L.A. Gordon, and R.R. Wermers. 2006. "Herd Behavior in Voluntary Disclosure Decisions: An Examination of Capital Expenditure Forecasts." Working Paper, University of Southern California and University of Maryland.

Bushee, B.J. 1998. "The Influence of Institutional Investors on Myopic R&D Investment Behavior." The Accounting Review, 73: 305-333.

Bushee, B.J. 2001. "Do Institutional Investors Prefer Near-Term Earnings over Long-Run Value?" Contemporary Accounting Research, Vol. 18, No. 2: 207-246.

Bushee, B.J., M.J. Jung, and G.S. Miller. 2009. "Capital Market Consequences of Conference Presentations." Working Paper, University of Michigan and University of Pennsylvania.

Bushee, B.J., and G.S. Miller. 2009. "Investor Relations, Firm Visibility, and Investor Following." Working Paper, University of Michigan and University of Pennsylvania.

Bushee, B.J., and C.F. Noe. 2000. "Corporate Disclosure Practices, Institutional Investors, and Stock Return Volatility." Journal of Accounting Research, Vol. 38: 171-202.

Carleton, W.T., J.M. Nelson, and M.S. Weisbach. 1998. "The Influence of Institutions on Corporate Governance through Private Negotiations: Evidence from TIAA-CREF." The Journal of Finance, Vol. 53, No. 4: 1335-1362.

Chen, X., J. Harford, and K. Li. 2007. "Monitoring: Which institutions matter?" Journal of Financial Economics, 86: 279-305.

Cohen, L., and A. Frazzini. 2008. "Economic Links and Predictable Returns." The Journal of Finance, Vol. 63, No. 4: 1977-2011.

Covrig, V.M., M.L. DeFind, M. Hung. 2007. "Home Bias, Foreign Mutual Fund Holdings, and the Voluntary Adoption of International Accounting Standards." Journal of Accounting Research, Vol. 45, No. 1: 41-70.

Cox, D.R. 1972. "Regression Models and Life-Tables." Journal of the Royal Statistical Society, Series B (Methodological), Vol. 34, No. 2: 187-220.

Del Guercio, D. 1996. "The distorting effect of the prudent-man laws on institutional equity investments." Journal of Financial Economics, Vol. 40, Issue 1: 31-62.

Diamond, D.W., and R.E. Verrecchia. 1991. "Disclosure, Liquidity, and the Cost of Capital." The Journal of Finance, Vol. 46, No. 4: 1325-1359.

Easterbrook, F.H., and D.R. Fischel. 1982. "Corporate Control Transactions." The Yale Law Journal, Vol. 91, No. 4: 698-737.

Einhorn, E., and A. Ziv. 2008. "Intertemporal Dynamics of Corporate Voluntary Disclosures." Journal of Accounting Research, Vol. 46, No. 3: 567-589.

Falkenstein, E.G. 1996. "Preferences for Stock Characteristics As Revealed by Mutual Fund Portfolio Holdings." The Journal of Finance, Vol. 51, No. 1: 111-135.

Foster, G. 1981. "Intra-Industry Information Transfers Associated with Earnings Releases." Journal of Accounting and Economics, Vol. 3: 201-232.

Frankel, R., M. Johnson, and D.J. Skinner. 1999. "An Empirical Examination of Conference Calls as a Voluntary Disclosure Medium." Journal of Accounting Research, Vol. 37, No. 1: 133-150.

Gaspar, J., M. Massa, and P. Matos. 2005. "Shareholder investment horizons and the market for corporate control." Journal of Financial Economics, 76: 135-165.

Glosten, L.R., and P.R. Milgrom. 1985. "Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders." Journal of Financial Economics, 14: 71-100.

Gompers, P.A., and A. Metrick. 2001. "Institutional Investors and Equity Prices." The Quarterly Journal of Economics, Vol. 116, No. 1: 229-259.

Graham, J.R., C.R. Harvey, and S. Rajgopal. 2005. "The economic implications of corporate financial reporting." Journal of Accounting and Economics, 40: 3-73.

Guay, W., and S.P. Kothari. 2003. "How much do firms hedge with derivatives?" Journal of Financial Economics, 70: 423-461.

Hansen, R.G., and J.R. Lott, Jr. 1996. "Externalities and Corporate Objectives in a World with Diversified Shareholders/Consumers." Journal of Financial and Quantitative Analysis, Vol. 31, No. 1: 43-68.

Hartzell, J.C., and L.T. Starks. 2003. "Institutional Investors and Executive Compensation." The Journal of Finance, Vol. 58, No. 6: 2351-2374.

Healy, P.M., A.P. Hutton, and K.G. Palepu. 1999. "Stock Performance and Intermediation Changes Surrounding Sustained Increases in Disclosure." Contemporary Accounting Research, Vol.16, No. 3: 485-520.

Herz, R.H., F.J. Elmy, and B.J. Bushee. 1996. "Derivatives: Were 1994 Disclosures Adequate." Journal of Corporate Accounting and Finance. 21-34.

Hodder, L., and M.L. McAnally. 2001. "SEC Market-Risk Disclosures: Enhancing Comparability." Financial Analyst Journal. 62-78.

Hong, H., and M. Huang. 2005. "Talking up liquidity: insider trading and investor relations." Journal of Financial Intermediation, Vol. 14: 1-31.

Jackson, H. 2009 (Mar.). "America's Most Shareholder Friendly Companies: Easy Access in Hard Times." Institutional Investor. 57-62.

Jiambalvo, J., S. Rajgopal, and M. Venkatachalam. 2002. "Institutional Ownership and the Extent to which Stock Prices Reflect Future Earnings." Contemporary Accounting Research, Vol. 19, No. 1: 117-145.

Jorion, P. 2002. "How Informative Are Value-at-Risk Risk Disclosures?" The Accounting Review, Vol. 77, No. 4: 911-931.

Kahn, C., and A. Winton. 1998. "Ownership Structure, Speculation, and Shareholder Intervention." The Journal of Finance, Vol. 53, No. 1: 99-129.

Lang, M.H., and R.J. Lundholm. 1993. "Cross-Sectional Determinants of Analyst Ratings of Corporate Disclosures." Journal of Accounting Research, Vol. 31, No. 2: 246-271.

Lang, M.H., and R.J. Lundholm. 1996. "Corporate Disclosure Policy and Analyst Behavior." The Accounting Review, Vol. 71, No. 4: 467-492.

Lansford, B., B. Lev, and J.W. Tucker. 2009. "Causes and Consequences of Disaggregating Earnings Guidance." Working Paper, University of Michigan, New York University, and University of Florida.

Leuz, C., and R.E. Verrecchia. 2000. "The Economic Consequences of Increased Disclosure." Journal of Accounting Research, Vol. 38: 91-124.

Linsmeier, T.J., and N.D. Pearson. 1997. "Quantitative Disclosures of Market Risk in the SEC Release." Accounting Horizons, Vol. 11, No. 1: 107-135.

Linsmeier, T.J., D.B. Thornton, M. Venkatachalam, and M. Welker. 2002. "The Effect of Mandated Market Risk Disclosures on Trading Volume Sensitivity to Interest Rate, Exchange Rate, and Commodity Price Movements." The Accounting Review, Vol. 77, No. 2: 343-377.

Liu, C., S.G. Ryan, and H. Tan. 2004. "How Banks' Value-at-Risk Disclosures Predict their Total and Priced Risk: Effects of Bank Technical Sophistication and Learning over Time." Review of Accounting Studies, 9: 265-294.

Malmendier, U., and D. Shanthikumar. 2007. "Are small investors naïve about incentives?" Journal of Financial Economics, Vol. 85: 457-489.

Merton, R.C. 1987. "A Simple Model of Capital Market Equilibrium with Incomplete Information." The Journal of Finance, Vol. 42, No. 3: 483-510.

Mikhail, M.B., B.R. Walther, and R.H. Willis. 2010. "When Security Analysts Talk, Who Listens?" The Accounting Review, forthcoming.

O'Brien, P.C., and R. Bhushan. 1990. "Analyst Following and Institutional Ownership." Journal of Accounting Research, Vol. 28: 55-76.

Parrino, R., R.W. Sias, and L.T. Starks. 2003. "Voting with their feet: institutional ownership changes around forced CEO turnover." Journal of Financial Economics, 68: 3-46.

Peng, L. 2005. "Learning with Information Capacity Constraints." Journal of Financial and Quantitative Analysis, Vol. 40, No. 2: 307-329.

Piotroski, J.D., and D.T. Roulstone. 2004. "The Influence of Analysts, Institutional Investors, and Insiders on the Incorporation of Market, Industry, and Firm-Specific Information into Stock Prices." The Accounting Review, Vol. 79, No. 4: 1119-1151.

Rajgopal, S. 1999. "Early Evidence on the Informativeness of the SEC's Market Risk Disclosures: The Case of Commodity Price Risk Exposure of Oil and Gas Producers." The Accounting Review, Vol. 74, No. 3: 251-280.

Reppenhagen, D.A. 2009. "Contagion vs. Intrinsic Factors of Accounting Policy Choice." Working paper, University of Florida.

Rogers, W.H. 1993. "Regression Standard Errors in Clustered Samples." Stata Technical Bulletin, 13: 19-23.

Roulstone, D.T. 1999. "Effect of SEC Financial Reporting Release No. 48 on Derivative and Market Risk Disclosures." Accounting Horizons, Vol. 13, No. 4: 343-363.

Ryan, S.G. 1997. "A Survey of Research Relating Accounting Numbers to Systematic Equity Risk, with Implications for Risk Disclosure Policy and Future Research." Accounting Horizons, Vol. 11, No. 2: 82-95.

Ryan, S.G. 2007. "Financial Instruments & Institutions: Accounting and Disclosure Rules." John Wiley & Sons, Inc., Second Edition.

Schleifer, A., and R.W. Vishny. 1996. "Large Shareholders and Corporate Control." The Journal of Political Economy, Vol. 94, No. 3: 461-488.

Securities and Exchange Commission. 1998. "Review of the First Phase of Filings of Disclosures of Quantitative and Qualitative Information about Market Risks Inherent in Derivative Instruments and other Financial Instruments." Staff Report.

Sims, C.A. 2003. "Implications of rational inattention." Journal of Monetary Economics, 50: 665-690.

Smith, M.P. 1996. “Shareholder Activism by Institutional Investors: Evidence from CalPERS.” The Journal of Finance, Vol. 51, No. 1: 227-252.

Smith, R.J., and R.W. Blundell. 1986. “An Exogeneity Test for a Simultaneous Equation Tobit Model with an Application to Labor Supply.” Econometrica, Vol. 54, No. 3: 679-685.

Thomas, J., and X.F. Zhang. 2008. "Overreaction to Intra-Industry Information Transfers." Journal of Accounting Research, Vol. 46, No. 4: 909-940.

Tse, S., and J.W. Tucker. 2010. “Within-Industry Timing of Earnings Warnings: Do Managers Herd?” Review of Accounting Studies, forthcoming.

Van Nieuwerburgh, S., and L. Veldkamp. 2010. “Information Acquisition and Under-Diversification.“ Review of Economic Studies, Vol. 77, Issue 2: 779-805.

Walther, B.R. 1997. “Investor Sophistication and Market Earnings Expectations.” Journal of Accounting Research, Vol. 35, No. 2: 157-179.

Wooldridge, J.M. 2001. “Econometric Analysis of Cross Section and Panel Data.” The MIT Press, First Edition.

Appendix

Examples of Market Risk Disclosures Using Three Possible Quantitative Formats

Panel A: Tabular Presentation (from Apache Corp.'s 1999 10-K Filing)

Commodity Price Hedges -- Apache periodically enters into commodity derivative contracts and fixed-price physical contracts to manage its exposure to oil and gas price volatility. Commodity derivatives contracts, which are usually placed with major financial institutions that the Company believes are minimal credit risks, may take the form of futures contracts, swaps or options. The derivative contracts call for Apache to receive, or make, payments based upon the differential between a fixed and a variable commodity price as specified in the contract. As a result of these activities, Apache recognized hedging losses of $6.7 million in 1999 and hedging gains of $1.3 million and $14.5 million in 1998 and 1997, respectively. The hedging gains and losses are included in oil and gas production revenues in the statement of consolidated operations.

The following table and note thereto cover the Company's pricing and notional volumes on open commodity derivative contracts as of December 31, 1999:

	2000	2001	2002	2003	2004	THEREAFTER
Natural Gas Swap Positions (FERC indexes):						
Pay fixed price -- January 2000 to July 2008 (thousand MMBtu/d)(1)	50	30	30	30	30	32
Average swap price, per MMBtu(1)	$ 2.27	$ 2.27	$ 2.31	$2.35	$2.39	$2.51
Oil Swap Positions (NYMEX):						
Receive fixed price -- January to August 2000 (Mbbl/d)	5	--	--	--	--	--
Swap price, per bbl	$19.42	--	--	--	--	--
Oil Swap Positions (NYMEX):						
Receive fixed price -- January 2000 to June 2002 (Mbbl/d)	10	9	8	--	--	--
Average swap price, per bbl	$20.52	$18.82	$18.45	--	--	--
Oil Collar Positions (NYMEX):						
Volume -- January to August 2000 (Mbbl/d)	13	--	--	--	--	--
Average ceiling price, per bbl	$23.00	--	--	--	--	--
Average floor price, per bbl	$17.73	--	--	--	--	--
Gas Collar Positions (NYMEX):						
Volume -- January to August 2000 (thousand MMBtu/d)	80	--	--	--	--	--
Average ceiling price, per MMBtu	$ 3.31	--	--	--	--	--
Average floor price, per MMBtu	$ 2.06	--	--	--	--	--

(1) The Company has various contracts to supply gas at fixed prices. In order to lock in a margin on a portion of the volumes, the Company is a fixed price payor on swap transactions. The average physical contract price ranges from $2.32 in 2000 to $2.56 in 2008. The fair value of these hedges was $11.1 million at December 31, 1999, all of which is related to the arrangements discussed in Note 6.

Panel B: Sensitivity Analysis (from Apache Corp.'s 1999 10-K Filing)

MARKET RISK

Commodity Risk

The Company's major market risk exposure is in the pricing applicable to its oil and gas production. Realized pricing is primarily driven by the prevailing worldwide price for crude oil and spot prices applicable to its United States and Canadian natural gas production. Historically, prices received for oil and gas production have been volatile and unpredictable and price volatility is expected to continue. Monthly oil price realizations ranged from a low of $10.09 per barrel to a high of $24.11 per barrel during 1999. Gas price realizations ranged from a monthly low of $1.60 per Mcf to a monthly high of $2.74 per Mcf during the same period.

The Company periodically enters into hedging activities on a portion of its projected oil and natural gas production through a variety of financial and physical arrangements intended to support oil and natural gas prices at targeted levels and to manage its exposure to oil and gas price fluctuations. Apache may use futures contracts, swaps, options and fixed-price physical contracts to hedge its commodity prices. Realized gains or losses from the Company's price risk management activities are recognized in oil and gas production revenues when the associated production occurs. Apache does not hold or issue derivative instruments for trading purposes. In 1999, Apache recognized a net loss of $3.1 million from hedging activities that decreased oil and gas production revenues. The net loss in 1999 includes $6.7 million in derivatives losses and $3.6 million in gains from fixed-price physical gas contracts. Gains or losses on derivative contracts are expected to be offset by sales at the spot market price or to preserve the margin on existing physical gas contracts.

At December 31,1999, the Company had open natural gas price swap positions with a positive fair value of $11.1 million. A 10 percent increase in natural gas prices would increase the fair value by $19.7 million. A 10 percent decrease in prices would decrease the fair value by $19.7 million. The Company also had open oil price swap positions at December 31, 1999 with a negative fair value of $(9.4) million. A 10 percent increase in oil prices would decrease the fair value by $18.3 million. A 10 percent decrease in oil prices would increase the fair value by $18.3 million. Discount rates used in arriving at fair values range from 6.5 percent for 2000 to 7.3 percent for 2008.

At December 31, 1999, the Company also had natural gas commodity collars with a fair value of $.8 million and oil commodity collars with a fair value of $(4.9) million. A 10 percent increase in oil and gas prices would change the fair values of the gas collars and the oil collars by $(.9) million and $(5.2) million, respectively. A 10 percent decrease in oil and gas prices would change the fair values of the gas collars and the oil collars by $1.6 million and $3.9 million, respectively. The model used to arrive at the fair values for the commodity collars is based on the Black commodity pricing model. Changes in fair value, assuming 10 percent price changes, assume non-constant volatility with volatility based on prevailing market parameters at December 31,1999.

Notional volumes associated with the Company's derivative contracts are shown in Note 9 to the Company's consolidated financial statements.

APPENDIX (continued)

Examples of Market Risk Disclosures Using Three Possible Quantitative Formats

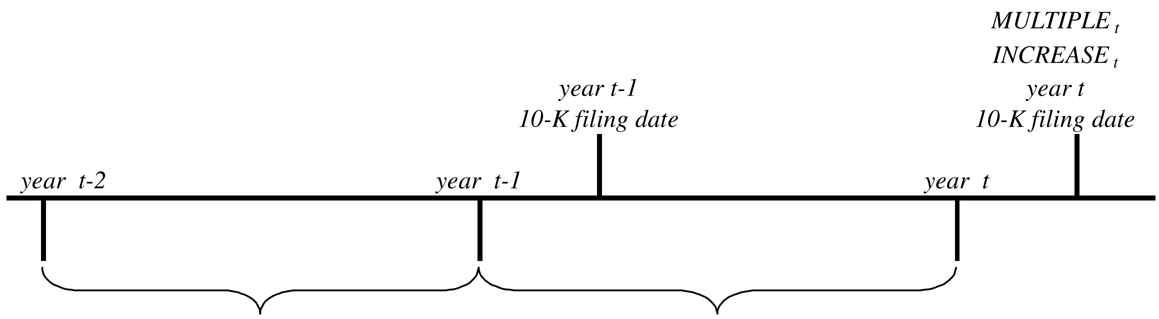
Panel C: Value-At-Risk (from Unocal Corp.'s 2001 10-K Filing)

Commodity Price Risk - The Company is a producer, purchaser, marketer and trader of certain hydrocarbon commodities such as crude oil and condensate, natural gas and refined products and is subject to the associated price risks. The Company uses hydrocarbon price-sensitive derivative instruments (hydrocarbon derivatives), such as futures contracts, swaps, collars and options to mitigate its overall exposure to fluctuations in hydrocarbon commodity prices. The Company may also enter into hydrocarbon derivatives to hedge contractual delivery commitments and future crude oil and natural gas production against price exposure. The Company also actively trades hydrocarbon derivatives, primarily exchange regulated futures and options contracts, subject to internal policy limitations.

The Company uses a variance-covariance value at risk model to assess the market risk of its hydrocarbon derivatives. Value at risk represents the potential loss in fair value the Company would experience on its hydrocarbon derivatives, using calculated volatilities and correlations over a specified time period with a given confidence level. The Company's risk model is based upon historical data and uses a three-day time interval with a 97.5 percent confidence level. The model includes offsetting physical positions for hydrocarbon derivatives related to the Company's fixed price pre-paid crude oil and pre-paid natural gas sales. The model also includes the Company's net interests in its subsidiaries' crude oil and natural gas hydrocarbon derivatives and forward sales contracts. Based upon the Company's risk model, the value at risk related to hydrocarbon derivatives held for purposes other than hedging was approximately $11 million at December 31, 2001 and approximately $12 million at December 31, 2000. The value at risk related to hydrocarbon derivatives held for non-hedging purposes was approximately $5 million at December 31, 2001 and approximately $13 million at December 31, 2000.

The Appendix provides examples of the three quantitative formats prescribed by the SEC in Financial Reporting Release No. 48 (1997). Firms are required to disclose their exposures to market risk, to the extent that the risk is material, using one of three possible quantitative formats: tabular presentation, sensitivity analysis, and value-at-risk. Market risk includes interest rate risk, foreign currency exchange risk, commodity price risk, and equity price risk. Examples are from the Crude Oil & Natural Gas industry (SIC 1311). Apache Corp. was the first firm in the industry to include multiple formats in its market risk disclosure, having done so in its 1999 10-K filing. Panel A illustrates its tabular presentation and Panel B shows its sensitivity analysis. Unocal Corporation included multiple formats beginning with its 2001 10-K filing; panel C illustrates its value-at-risk estimates.

FIGURE 1
Timeline of Variable Measurement



$\Delta OVLPII_{t-1}$	$OVLPII_{t-1}$	$\Delta OVLPII_{t}$	$OVLPII_{t}$
$\Delta OVLPII\_LARGE_{t-1}$	$OVLPII\_LARGE_{t-1}$	$\Delta OVLPII\_LARGE_{t}$	$OVLPII\_LARGE_{t}$
$\Delta OVLPII\_SMALL_{t-1}$	$OVLPII\_SMALL_{t-1}$	$\Delta OVLPII\_SMALL_{t}$	$OVLPII\_SMALL_{t}$
$\Delta OVLPII\_DED_{t-1}$	$OVLPII\_DED_{t-1}$	$\Delta OVLPII\_DED_{t}$	$OVLPII\_DED_{t}$
$\Delta OVLPII\_QIX_{t-1}$	$OVLPII\_QIX_{t-1}$	$\Delta OVLPII\_QIX_{t}$	$OVLPII\_QIX_{t}$
$\Delta OVLPII\_TRA_{t-1}$	$OVLPII\_TRA_{t-1}$	$\Delta OVLPII\_TRA_{t}$	$OVLPII\_TRA_{t}$
ΔPIH_{t-1}	PIH_{t-1}	ΔPIH_{t}	PIH_{t}
$\Delta OVLPAN_{t-1}$	$OVLPAN_{t-1}$	$\Delta OVLPAN_{t}$	$OVLPAN_{t}$
$\Delta OVLPAUD_{t-1}$	$OVLPAUD_{t-1}$	$\Delta OVLPAUD_{t}$	$OVLPAUD_{t}$
$\Delta HEDGING_{t-1}$	$HEDGING_{t-1}$	$\Delta HEDGING_{t}$	$HEDGING_{t}$
$\Delta TRADING_{t-1}$	$TRADING_{t-1}$	$\Delta TRADING_{t}$	$TRADING_{t}$
ΔLMV_{t-1}	LMV_{t-1}	ΔLMV_{t}	LMV_{t}
ΔROA_{t-1}	ROA_{t-1}	ΔROA_{t}	ROA_{t}
ΔDTE_{t-1}	DTE_{t-1}	ΔDTE_{t}	DTE_{t}
ΔBTM_{t-1}	BTM_{t-1}	ΔBTM_{t}	BTM_{t}
ΔSAR_{t-1}	SAR_{t-1}	ΔSAR_{t}	SAR_{t}
$\Delta STOCKLIQ_{t-1}$	$STOCKLIQ_{t-1}$	$\Delta STOCKLIQ_{t}$	$STOCKLIQ_{t}$
$\Delta STOCKVOL_{t-1}$	$STOCKVOL_{t-1}$	$\Delta STOCKVOL_{t}$	$STOCKVOL_{t}$
$\Delta OILPRC_{t-1}$	$LNOILPRC_{t-1}$	$\Delta OILPRC_{t}$	$LNOILPRC_{t}$
$\Delta OILVOL_{t-1}$	$OILVOL_{t-1}$	$\Delta OILVOL_{t}$	$OILVOL_{t}$
$\Delta PRIMERATE_{t-1}$	$PRIMERATE_{t-1}$	$\Delta PRIMERATE_{t}$	$PRIMERATE_{t}$
$\Delta PRIMERATEVOL_{t-1}$	$PRIMERATEVOL_{t-1}$	$\Delta PRIMERATEVOL_{t}$	$PRIMERATEVOL_{t}$

Figure 1 illustrates when each variable is measured relative to a firm's 10-K filing for year *t*. For 145 of the 153 sample firms (95%), the fiscal year ends in December. All variable definitions are provided in Table 1.

TABLE 1
Definition of Variables

Variable Name	Definition	Source of Data
MULTIPLE	Indicator set to 1 if firm *i* in year *t* disclosed multiple formats, 0 otherwise.	10-K filings
INCREASE	Indicator set to 1 if firm *i* in year *t* increased the number of formats from the prior year, 0 otherwise.	10-K filings
NII	Number of institutional investors for firm *i* in December of year *t*.	Thomson-Reuters (13F) Database
OVLPII	Number of overlapping institutional investors in December of year *t* between firm *i* in industry *k* and the first-mover in industry *k*, scaled by NII.	Thomson-Reuters (13F) Database
OVLPII_LARGE	Overlapping institutional investors that are in the top quintile ranked by total value of assets under management in year *t*.	Thomson-Reuters (13F) Database
OVLPII_SMALL	Overlapping institutional investors that are in the bottom four quintiles ranked by total value of assets under management in year *t*.	Thomson-Reuters (13F) Database
OVLPII_DED	Overlapping institutional investors that are classified as "dedicated" in year *t*.	Thomson-Reuters (13F) Database
OVLPII_QIX	Overlapping institutional investors that are classified as "quasi-indexer" in year *t*.	Thomson-Reuters (13F) Database
OVLPII_TRA	Overlapping institutional investors that are classified as "transient" in year *t*.	Thomson-Reuters (13F) Database
PIH	Percentage of firm *i*'s total shares outstanding owned by institutional investors in December of year *t*.	Thomson-Reuters (13F) Database
NAN	Number of sell-side analysts covering firm *i* in year *t*.	IBES
OVLPAN	Number of unique sell-side analysts who issued a one-year sales or earnings forecast during year *t* for both firm *i* in industry *k* and the first-mover in industry *k*, scaled by NAN.	IBES
OVLPAUD	Indicator set to 1 if firm *i* in industry *k* and the first-mover in industry *k* use the same audit firm from the same office location during year *t*, 0 otherwise.	10-K filings
HEDGING	Indicator set to 1 if firm *i* in year *t* uses derivatives for hedging purposes, 0 otherwise.	10-K filings
TRADING	Indicator set to 1 if firm *i* in year *t* uses derivatives for trading purposes, 0 otherwise.	10-K filings

TABLE 1 (Continued)
Definition of Variables

Variable Name	Definition	Source of Data
LMV	Log of market value of equity, common shares outstanding times stock price, at fiscal year end.	Compustat
ROA	Income before extraordinary items divided by total assets at fiscal year end.	Compustat
DTE	Long-term debt divided by market value of equity at fiscal year end.	Compustat
BTM	Stockholder's equity divided by market value of equity at fiscal year end.	Compustat
SAR	Raw return minus the capitalization-based decile return of the index.	CRSP
STOCKLIQ	Average monthly trading volume divided by total shares outstanding.	CRSP
STOCKVOL	Standard deviation of monthly size-adjusted returns (SARs).	CRSP
OILPRC	Year-end spot price for a barrel of crude oil.	U.S. Energy Information Admin.
LNOILPRC	Log of the year-end spot price for a barrel of crude oil.	U.S. Energy Information Admin.
OILVOL	Standard deviation of monthly returns on oil prices for the year.	U.S. Energy Information Admin.
PRIMERATE	Year-end prime rate.	U.S. Federal Reserve
PRIMERATEVOL	Standard deviation of monthly prime rate changes for the year.	U.S. Federal Reserve

TABLE 2

Sample Selection and Distribution of the Dependent Variables

Panel A: Composition of Sample Firms

SIC	Industry Name	Firms	Industry First-Movers: First firm to disclose multiple quantitative formats	Year	Followers: Number of firms that subsequently disclosed multiple formats	Non-Followers: Number of firms that subsequently never disclosed multiple formats
1311	Crude Petroleum & Natural Gas	43	Apache Corp.	1999	23	19
2911	Petroleum Refining	10	Marathon Oil	2003	2	7
6020	National Commercial Banks	30	Bank of America	1997	20	9
6211	Security Brokers & Dealers	16	Morgan Stanley	1997	8	7
6798	Real Estate Investment Trusts	54	HRPT Properties	1998	24	29
	Total	153			77	71

Panel B: Transition Matrix

BEFORE	AFTER: None	Tab.	SA	VAR	Tab. & SA	Tab. & VAR	SA & VAR	Tab., SA & VAR
None	3	1			2		1	1
Tabular		23	1		29			
Sensitivity Analysis		1	37	1	27		3	
Value-at-Risk				2		3	2	
Tabular & SA								5
Tabular & VAR								2
SA & VAR							2	2
Tabular, SA & VAR								
Total Follower Firms					**58**	**3**	**6**	**10**

Panel C: Distribution of Dependent Variable MULTIPLE=1 by Fiscal Year

Fiscal Year	Sample Firms	MULTIPLE=0	MULTIPLE=1	% of Firms where MULTIPLE=1
1998	44	24	20	45%
1999	97	71	26	27%
2000	138	107	31	22%
2001	138	96	42	30%
2002	138	91	47	34%
2003	138	83	55	40%
2004	146	87	59	40%
2005	135	79	56	41%
2006	127	72	55	43%
2007	119	60	59	50%
Total Firm-Years	1,220	770	450	37%

TABLE 2 (continued)
Sample Selection and Distribution of the Dependent Variables

Panel D: Distribution of Dependent Variable INCREASE=1 by Fiscal Year

Fiscal Year	Sample Firms	INCREASE=0	INCREASE=1	Distribution of INCREASE=1
1998	35	30	5	6%
1999	83	76	7	9%
2000	115	109	6	8%
2001	112	98	14	18%
2002	105	94	11	14%
2003	96	83	13	17%
2004	94	87	7	9%
2005	86	79	7	9%
2006	74	72	2	3%
2007	65	60	5	6%
Total Firm-Years	865	788	77	100%

Panel E: Distribution of INCREASE=1 by Industry and Event Year

Event Year	SIC 1311 Oil & Gas	SIC 2911 Oil Refining	SIC 6020 Banks	SIC 6211 Brokers	SIC 6798 REITs	Total	% of Total
Year 1	2	0	5	0	2	9	12%
Year 2	6	1	5	0	2	14	18%
Year 3	3	0	1	1	4	9	12%
Year 4	5	1	4	0	6	16	21%
Year 5	4	0	1	1	4	10	13%
Year 6	2	0	2	2	1	7	9%
Year 7	0	0	1	1	0	2	3%
Year 8	1	0	1	3	2	7	9%
Year 9	0	0	0	0	3	3	4%
Year 10	0	0	0	0	0	0	0%
Total	23	2	20	8	24	77	100%

Table 2 provides descriptive statistics about the sample firms and the two dependent variables (MULTIPLE and INCREASE) used in the logistic regressions of equations (1) and (2). Panel A shows the five industries (by SIC) and the number of firms from each industry included in the sample. Within each industry, a first-mover is identified as the first firm to include multiple quantitative formats in its market risk disclosure. Also shown is the number of firms in each industry that eventually followed the industry first-mover's decision to include multiple formats. Panel B shows the formats disclosed by the potential follower firms in their initial and final sample years of their 10-K filing. Panel C shows, by fiscal year, the number of firms that include multiple formats in its market risk disclosure. Panel D shows, by fiscal year, the number of firms that changed their market risk disclosure (relative to the prior year's 10-K) to include more formats. Panel E shows, by industry and event year (relative to the industry first-mover), the number of firms that changed their market risk disclosures to include more formats.

TABLE 3

Descriptive Statistics and Correlations

Panel A: Descriptive Statistics of Variables Used in Levels Analysis (N=1,220)

Variable	Mean	Std. Dev.	Min	Q1	Median	Q3	Max
PIH	0.578	0.241	0.003	0.417	0.605	0.774	1.000
NII	212.553	217.694	2.000	93.000	146.000	249.000	1,540.000
OVLPII	0.705	0.166	0.258	0.576	0.740	0.839	1.000
OVLPII_LARGE	0.547	0.147	0.160	0.442	0.553	0.663	1.000
OVLPII_SMALL	0.158	0.124	0.000	0.069	0.111	0.217	0.601
OVLPII_DED	0.024	0.016	0.000	0.015	0.021	0.029	0.182
OVLPII_QIX	0.497	0.130	0.000	0.408	0.492	0.593	1.000
OVLPII_TRA	0.163	0.064	0.000	0.116	0.167	0.210	0.500
NAN	12.148	10.321	0.000	4.000	9.000	18.000	52.000
OVLPAN	0.288	0.296	0.000	0.000	0.200	0.500	1.000
OVLPAUD	0.047	0.211	0.000	0.000	0.000	0.000	1.000
HEDGING	0.853	0.354	0.000	1.000	1.000	1.000	1.000
TRADING	0.181	0.385	0.000	0.000	0.000	0.000	1.000
LMV	7.642	1.716	1.866	6.681	7.546	8.630	13.131
ROA	0.036	0.052	-0.222	0.012	0.022	0.050	0.240
DTE	0.677	0.772	0.000	0.183	0.489	0.877	4.771
BTM	0.595	0.366	0.094	0.375	0.505	0.705	2.405
SAR	0.106	0.461	-0.782	-0.171	0.048	0.287	2.111
STOCKLIQ	0.114	0.084	0.011	0.059	0.090	0.144	0.460
STOCKVOL	0.085	0.051	0.030	0.052	0.070	0.100	0.323
OILPRC	41.993	21.859	11.350	28.440	32.130	59.410	91.690
LNOILPRC	3.609	0.509	2.429	3.348	3.470	4.084	4.518
OILVOL	0.073	0.009	0.059	0.066	0.070	0.079	0.090
PRIMERATE	6.492	1.907	4.000	4.840	7.150	8.250	9.500
PRIMERATEVOL	0.103	0.034	0.061	0.085	0.097	0.111	0.184

TABLE 3 (continued)
Descriptive Statistics and Correlations

Panel B: Descriptive Statistics of Variables Used in Changes Analysis (N=865)

Variable	Mean	Std. Dev.	Min	Q1	Median	Q3	Max
ΔPIH	0.031	0.098	-0.814	-0.014	0.023	0.070	0.608
ΔNII	16.628	31.739	-176.000	0.000	11.000	27.000	248.000
ΔOVLPII	0.011	0.068	-0.338	-0.024	0.010	0.044	0.500
ΔOVLPII_LARGE	0.007	0.072	-0.409	-0.030	0.004	0.043	0.550
ΔOVLPII_SMALL	0.004	0.042	-0.191	-0.016	0.003	0.025	0.250
ΔOVLPII_DED	-0.001	0.017	-0.110	-0.008	-0.001	0.006	0.182
ΔOVLPII_QIX	0.002	0.070	-0.338	-0.030	0.001	0.034	0.750
ΔOVLPII_TRA	0.007	0.050	-0.250	-0.014	0.007	0.031	0.308
ΔNAN	0.653	3.299	-18.000	-1.000	1.000	2.000	17.000
ΔOVLPAN	0.005	0.188	-1.000	-0.038	0.000	0.057	1.000
ΔOVLPAUD	-0.001	0.113	-1.000	0.000	0.000	0.000	1.000
ΔHEDGING	0.014	0.204	-1.000	0.000	0.000	0.000	1.000
ΔTRADING	0.001	0.076	-1.000	0.000	0.000	0.000	1.000
ΔLMV	0.147	0.443	-2.788	-0.067	0.142	0.336	3.514
ΔROA	0.002	0.052	-0.241	-0.008	0.000	0.009	0.283
ΔDTE	-0.032	0.578	-2.932	-0.130	0.000	0.100	2.547
ΔBTM	-0.019	0.273	-1.014	-0.115	-0.017	0.078	0.999
ΔSAR	-0.007	0.745	-2.393	-0.387	-0.033	0.336	2.252
ΔSTOCKLIQ	0.014	0.047	-0.106	-0.007	0.008	0.027	0.233
ΔSTOCKVOL	-0.006	0.047	-0.168	-0.024	-0.005	0.016	0.147
ΔOILPRC	0.268	0.434	-0.381	0.043	0.343	0.480	1.300
ΔOILVOL	0.000	0.014	-0.031	-0.002	0.006	0.010	0.015
ΔPRIMERATE	-0.179	1.937	-4.660	-0.590	0.750	1.100	2.000
ΔPRIMERATEVOL	0.002	0.048	-0.072	-0.031	0.015	0.036	0.078

Table 3 provides descriptive statistics of the variables used in the empirical tests for all firm-years. Panel A shows the values of the variables measured in levels and Panel B shows the year-to-year changes in the variables. Panel C shows pair-wise Pearson (upper diagonal) and Spearman (lower diagonal) correlations for the variables measured in levels and Panel D shows correlations of the change variables. All variable definitions are provided in Table 1. Values for ROA, DTE, BTM, SAR, STOCKLIQ and STOCKVOL have been winsorized at the 1^{st} and 99^{th} percentiles.

TABLE 3 (continued)

Descriptive Statistics and Correlations

Panel C: Pearson (upper diagonal) and Spearman (lower) Correlations of Variables in Levels Regressions (N=1,220)

	OVLPII	PIH	OVLPAN	OVLPAUD	LMV	ROA	DTE	BTM	SAR	STOCKLIQ	STOCKVOL
OVLPII		-0.35	0.25	0.09	0.00	-0.07	-0.18	-0.15	-0.05	0.03	0.11
PIH	-0.37		0.25	0.00	0.35	0.13	-0.02	-0.24	0.07	**0.41**	-0.27
OVLPAN	0.25	0.26		0.21	**0.43**	0.13	-0.05	-0.17	0.08	0.33	0.02
OVLPAUD	0.07	0.00	0.17		0.00	-0.04	0.18	0.05	0.02	0.12	0.12
LMV	0.07	0.29	**0.43**	0.02		0.09	-0.14	-0.41	0.02	0.10	-0.44
ROA	-0.26	0.21	0.10	-0.04	-0.02		-0.35	-0.27	0.33	0.16	0.09
DTE	-0.37	0.10	-0.15	0.10	-0.05	-0.34		**0.55**	-0.17	0.02	0.09
BTM	-0.19	-0.15	-0.19	0.08	-0.36	-0.16	**0.42**		-0.26	-0.07	0.22
SAR	-0.12	0.14	0.07	-0.02	0.09	0.28	-0.15	-0.26		0.11	0.37
STOCKLIQ	-0.08	**0.54**	0.37	0.14	0.15	0.14	-0.03	-0.12	0.09		0.21
STOCKVOL	0.03	-0.16	0.04	0.08	-0.42	0.15	-0.13	0.10	0.17	0.12	

Panel D: Pearson (upper diagonal) and Spearman (lower) Correlations of Variables in Changes Regressions (N=865)

	ΔOVLPII	ΔPIH	ΔOVLPAN	ΔOVLPAUD	ΔLMV	ΔROA	ΔDTE	ΔBTM	ΔSAR	ΔSTOCKLIQ	ΔSTOCKVOL
ΔOVLPII		-0.16	0.09	0.14	-0.22	-0.14	0.15	0.14	-0.16	-0.08	0.02
ΔPIH	-0.15		-0.07	-0.05	0.24	0.05	-0.16	-0.21	0.07	0.03	-0.06
ΔOVLPAN	0.02	-0.06		0.08	-0.07	-0.18	0.08	0.03	-0.11	-0.02	-0.09
ΔOVLPAUD	0.09	-0.07	0.06		-0.11	-0.11	0.10	0.05	-0.10	0.04	0.01
ΔLMV	-0.25	0.23	-0.07	-0.06		0.27	-0.60	-0.74	**0.54**	0.24	0.14
ΔROA	-0.10	0.06	-0.08	-0.03	0.24		-0.21	-0.17	0.26	0.14	0.11
ΔDTE	0.19	-0.15	0.10	0.04	-0.64	-0.28		**0.61**	-0.36	-0.04	0.02
ΔBTM	0.15	-0.19	0.04	0.01	-0.75	-0.15	**0.61**		-0.49	-0.11	-0.10
ΔSAR	-0.12	0.12	-0.05	-0.08	**0.49**	0.12	-0.37	-0.51		0.06	0.34
ΔSTOCKLIQ	-0.11	0.05	0.01	0.06	0.18	0.12	-0.05	-0.08	-0.01		0.39
ΔSTOCKVOL	0.01	-0.07	-0.01	0.03	0.10	0.08	0.02	-0.09	0.20	0.31	

TABLE 4
Levels and Changes Analyses of Investor Overlap

Panel A: Logistic Regression of ($MULTIPLE_t$=1) on Level of Investor Overlap $OVLPII_t$)

DEPENDENT VARIABLE: $MULTIPLE_t$ = 1								
Variable	H1	Coeff.	p-value		Coeff.	p-value		Marginal Effect
Intercept		-2.287	0.049	**	-6.332	<.0001	***	
$OVLPII_t$	+				3.894	0.000	***	0.178
PIH_t		-0.912	0.186		0.313	0.645		0.019
$OVLPAN_t$		-0.042	0.931		-0.673	0.202		-0.059
$OVLPAUD_t$		-2.541	0.000	***	-2.485	0.000	***	-0.433
$HEDGING_t$		0.357	0.355		0.474	0.173		0.083
$TRADING_t$		0.913	0.043	**	0.553	0.232		0.096
LMV_t		0.214	0.072	*	0.288	0.015	**	0.098
ROA_t		-11.773	<.0001	***	-9.229	<.0001	***	-0.061
DTE_t		-0.127	0.570		0.068	0.721		0.008
BTM_t		-1.562	0.005	***	-1.097	0.036	**	-0.063
SAR_t		-0.504	0.003	***	-0.384	0.022	**	-0.031
$STOCKLIQ_t$		-2.753	0.152		-3.382	0.082	*	-0.050
$STOCKVOL_t$		2.186	0.464		1.281	0.674		0.011
$LNOILPRC_t$		0.777	0.001	***	0.644	0.010	**	0.083
$OILSTD_t$		-7.187	0.372		-3.635	0.669		-0.008
$PRIMERATE_t$		-0.095	0.014	**	-0.089	0.037	**	-0.053
$PRIMERATEVOL_t$		0.602	0.768		0.554	0.801		0.003
N		1,220			1,220			
Pseudo-R^2		0.174			0.207			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel A shows the results of logistic regressions where the dependent variable is set to 1 (0 otherwise) if firm *i* includes multiple quantitative formats in its market risk disclosure for year *t* ($MULTIPLE_{i,t}$). The variable of interest, $OVLPII_{i,t}$, is the number of overlapping institutional investors between firm *i* in industry *k* and the first-mover in industry *k*, scaled by the total number of institutional investors in firm *i*, both measured at December of year *t*. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range (0 to 1 for indicator variables). All other variable definitions are provided in Table 1.

TABLE 4 (Continued)

Levels and Changes Analyses of Investor Overlap

Panel B: Logistic Regression of ($INCREASE_t$=1) on Prior Year Change in Investor Overlap ($\Delta OVLPII_{t-1}$)

DEPENDENT VARIABLE: $INCREASE_t$ = 1									
Variable	H1	Coeff.	p-value		Coeff.	p-value		Marginal Effect
Intercept		-2.520	<.0001	***	-2.607	<.0001	***	
$\Delta OVLPII_{t-1}$	+				4.398	0.020	**	0.023
ΔPIH_{t-1}		-0.213	0.845		-0.121	0.916		-0.001
$\Delta OVLPAN_{t-1}$		-0.102	0.894		-0.366	0.629		-0.003
$\Delta OVLPAUD_{t-1}$		-0.055	0.877		-0.190	0.585		0.000
$\Delta HEDGING_{t-1}$		-0.249	0.695		-0.214	0.733		0.000
$\Delta TRADING_{t-1}$		0.022	0.972		0.115	0.856		0.000
ΔLMV_{t-1}		0.720	0.059	*	0.720	0.065	*	0.022
ΔROA_{t-1}		-2.970	0.286		-2.625	0.319		-0.004
ΔDTE_{t-1}		0.568	0.002	***	0.575	0.003	***	0.010
ΔBTM_{t-1}		-0.032	0.946		-0.088	0.868		-0.001
ΔSAR_{t-1}		0.206	0.347		0.212	0.354		0.012
$\Delta STOCKLIQ_{t-1}$		1.148	0.723		1.443	0.665		0.004
$\Delta STOCKVOL_{t-1}$		4.115	0.161		2.950	0.290		0.009
$\Delta OILPRC_{t-1}$		-0.235	0.456		-0.346	0.270		-0.012
$\Delta OILSTD_{t-1}$		13.490	0.321		16.191	0.244		0.015
$\Delta PRIMERATE_{t-1}$		-0.204	0.041	**	-0.180	0.084	*	-0.024
$\Delta PRIMERATEVOL_{t-1}$		-1.839	0.611		-2.266	0.532		-0.012
N		865			865			
Pseudo-R^2		0.040			0.054			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel B shows the results of logistic regressions where the dependent variable is set to 1 (0 otherwise) if firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats ($INCREASE_{i,t}$). The variable of interest is $\Delta OVLPII_{t-1}$, the prior year change in investor overlap. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range. All other independent variables are lagged changes in the variables defined in Table 1.

TABLE 4 (Continued)
Levels and Changes Analyses of Investor Overlap

Panel C: Regression of Next Year's Change in Investor Overlap ($\Delta OVLPII_{t+1}$) on $INCREASE_t$

DEPENDENT VARIABLE: ΔOVLPII$_{t+1}$				
Variable	H1	Coeff.	p-value	
Intercept		0.010	0.004	***
INCREASE$_t$	+	0.004	0.578	
ΔPIH$_t$		-0.054	0.057	*
ΔOVLPAN$_t$		-0.028	0.082	*
ΔOVLPAUD$_t$		-0.027	0.176	
ΔHEDGING$_t$		-0.005	0.514	
ΔTRADING$_t$		-0.018	0.586	
ΔLMV$_t$		-0.001	0.958	
ΔROA$_t$		0.004	0.962	
ΔDTE$_t$		-0.004	0.704	
ΔBTM$_t$		-0.003	0.891	
ΔSAR$_t$		0.001	0.871	
ΔSTOCKLIQ$_t$		0.082	0.160	
ΔSTOCKVOL$_t$		-0.015	0.886	
ΔOILPRC$_t$		-0.005	0.586	
ΔOILVOL$_t$		1.094	<.0001	***
ΔPRIMERATE$_t$		0.000	0.930	
ΔPRIMERATEVOL$_t$		0.261	0.000	***
N		790		
Adjusted-R^2		0.033		

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel C shows the results of a multiple regression where the dependent variable is next year's change in investor overlap (ΔOVLPII$_{t+1}$). The variable of interest is INCREASE$_{i,t}$, an indicator of whether firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats. All other independent variables are current year changes in the variables defined in Table 1.

TABLE 5

Analyses of Investor Overlap Partitioned By Large and Small Institutions

Panel A: Logistic Regression of ($MULTIPLE_t$=1) on Level of Investor Overlap Partitioned by Large (OVLPII_LARGE) and Small (OVLPII_SMALL) Institutions

DEPENDENT VARIABLE: $MULTIPLE_t = 1$					
Variable	H2	Coeff.	p-value		Marginal Effect
Intercept		-7.520	<.0001	***	
$OVLPII\_LARGE_t$	+	4.835	0.000	***	0.186
$OVLPII\_SMALL_t$		2.289	0.173		0.059
PIH_t		0.225	0.738		0.014
$OVLPAN_t$		-0.636	0.227		-0.055
$OVLPAUD_t$		-2.473	<.0001	***	-0.429
$HEDGING_t$		0.508	0.134		0.088
$TRADING_t$		0.623	0.180		0.108
LMV_t		0.428	0.008	***	0.145
ROA_t		-9.665	<.0001	***	-0.063
DTE_t		0.073	0.704		0.009
BTM_t		-1.003	0.058	*	-0.057
SAR_t		-0.401	0.017	**	-0.032
$STOCKLIQ_t$		-3.349	0.083	*	-0.049
$STOCKVOL_t$		1.434	0.636		0.012
$LNOILPRC_t$		0.605	0.016	**	0.077
$OILSTD_t$		-4.463	0.604		-0.009
$PRIMERATE_t$		-0.082	0.060	*	-0.049
$PRIMERATEVOL_t$		-0.023	0.992		0.000
N		1,220			
Pseudo-R^2		0.209			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel A shows the results of a logistic regression where the dependent variable is set to 1 (0 otherwise) if firm *i* includes multiple quantitative formats in its market risk disclosure for year *t* ($MULTIPLE_{i,t}$). The independent variables of interest are $OVLPII\_LARGE_{i,t}$ and $OVLPII\_SMALL_{i,t}$, defined as the number of overlapping large and small institutions, respectively, between firm *i* in industry *k* and the first-mover in industry *k*, scaled by the total number of institutional investors in firm *i*. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range (0 to 1 for indicator variables). All variable definitions are provided in Table 1.

TABLE 5 (Continued)

Analyses of Investor Overlap Partitioned By Large and Small Institutions

Panel B: Logistic Regression of (INCREASE=1) on Prior Year Change in Investor Overlap Partitioned by Large ($\Delta OVLPII\_LARGE_{t-1}$) and Small ($\Delta OVLPII\_SMALL_{t-1}$) Institutions

DEPENDENT VARIABLE: $INCREASE_t = 1$					
Variable	H2	Coeff.	p-value		Marginal Effect
Intercept		-2.599	<.0001	***	
$\Delta OVLPII\_LARGE_{t-1}$	+	4.585	0.027	**	0.026
$\Delta OVLPII\_SMALL_{t-1}$		3.848	0.204		0.012
ΔPIH_{t-1}		-0.111	0.923		-0.001
$\Delta OVLPAN_{t-1}$		-0.379	0.617		-0.003
$\Delta OVLPAUD_{t-1}$		-0.228	0.566		0.000
$\Delta HEDGING_{t-1}$		-0.212	0.734		0.000
$\Delta TRADING_{t-1}$		0.111	0.861		0.000
ΔLMV_{t-1}		0.740	0.057	*	0.023
ΔROA_{t-1}		-2.654	0.320		-0.004
ΔDTE_{t-1}		0.580	0.003	***	0.010
ΔBTM_{t-1}		-0.081	0.878		-0.001
ΔSAR_{t-1}		0.207	0.363		0.012
$\Delta STOCKLIQ_{t-1}$		1.396	0.674		0.004
$\Delta STOCKVOL_{t-1}$		3.024	0.276		0.009
$\Delta OILPRC_{t-1}$		-0.373	0.253		-0.013
$\Delta OILSTD_{t-1}$		15.912	0.253		0.015
$\Delta PRIMERATE_{t-1}$		-0.175	0.089	*	-0.023
$\Delta PRIMERATEVOL_{t-1}$		-2.510	0.495		-0.013
N		865			
Pseudo-R^2		0.055			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel B shows the results of a logistic regression where the dependent variable is set to 1 (0 otherwise) if firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats ($INCREASE_{i,t}$). The variables of interest are $\Delta OVLPII\_LARGE_{t-1}$ and $\Delta OVLPII\_SMALL_{t-1}$, the prior year changes in overlapping large and small institutions, respectively. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range. All other independent variables are lagged changes in the variables defined in Table 1.

TABLE 6

Analyses of Investor Overlap Partitioned
By Dedicated, Quasi-Indexer and Transient Institutions

Panel A: Logistic Regression of ($MULTIPLE_t$=1) on Level of Investor Overlap Partitioned by Dedicated (OVLPII_DED), Quasi-Indexer (OVLPII_QIX) and Transient (OVLPII_TRA) Institutions

DEPENDENT VARIABLE: $MULTIPLE_t$ = 1					
Variable	H3	Coeff.	p-value		Marginal Effect
Intercept		-7.008	<.0001	***	
$OVLPII\_DED_t$		17.620	<.0001	***	0.045
$OVLPII\_QIX_t$	+	2.876	0.018	**	0.092
$OVLPII\_TRA_t$	+	5.300	0.007	***	0.086
PIH_t		0.092	0.897		0.006
$OVLPAN_t$		-0.720	0.179		-0.062
$OVLPAUD_t$		-2.526	0.000	***	-0.436
$HEDGING_t$		0.459	0.185		0.079
$TRADING_t$		0.546	0.252		0.094
LMV_t		0.336	0.006	***	0.113
ROA_t		-9.871	<.0001	***	-0.064
DTE_t		0.048	0.811		0.006
BTM_t		-1.106	0.034	**	-0.063
SAR_t		-0.448	0.009	***	-0.035
$STOCKLIQ_t$		-3.094	0.107		-0.045
$STOCKVOL_t$		1.309	0.678		0.011
$LNOILPRC_t$		0.726	0.004	***	0.092
$OILSTD_t$		-0.879	0.920		-0.002
$PRIMERATE_t$		-0.093	0.035	**	-0.055
$PRIMERATEVOL_t$		0.794	0.723		0.004
N		1,220			
Pseudo-R^2		0.212			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel A shows the results of a logistic regression where the dependent variable is set to 1 (0 otherwise) if firm *i* includes multiple quantitative formats in its market risk disclosure for year *t* ($MULTIPLE_{i,t}$). The independent variables of interest are $OVLPII\_DED_{i,t}$, $OVLPII\_QIX_{i,t}$, and $OVLPII\_TRA_{i,t}$, defined as the number of overlapping dedicated, quasi-indexer and transient institutions (Bushee 1998, 2001), respectively, between firm *i* in industry *k* and the first-mover in industry *k*, scaled by the total number of institutional investors in firm *i*. All variables are measured at December of year *t*. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range (0 to 1 for indicator variables). All other variable definitions are provided in Table 1.

TABLE 6 (Continued)

Analyses of Investor Overlap Partitioned
By Dedicated, Quasi-Indexer and Transient Institutions

Panel B: Logistic Regression of (INCREASE=1) on Prior Year Change in Investor Overlap Partitioned by Dedicated ($\Delta OVLPII\_DED_{t-1}$), Quasi-Indexer ($\Delta OVLPII\_QIX_{t-1}$) and Transient ($\Delta OVLPII\_TRA_{t-1}$) Institutions

DEPENDENT VARIABLE: $INCREASE_t = 1$					
Variable	H3	Coeff.	p-value		Marginal Effect
Intercept		-2.569	<.0001	***	
$\Delta OVLPII\_DED_{t-1}$		8.347	0.229		0.009
$\Delta OVLPII\_QIX_{t-1}$	+	3.656	0.039	**	0.018
$\Delta OVLPII\_TRA_{t-1}$	+	3.959	0.073	*	0.014
ΔPIH_{t-1}		-0.173	0.878		-0.001
$\Delta OVLPAN_{t-1}$		-0.319	0.678		-0.002
$\Delta OVLPAUD_{t-1}$		-0.307	0.426		0.000
$\Delta HEDGING_{t-1}$		-0.251	0.693		0.000
$\Delta TRADING_{t-1}$		0.164	0.798		0.000
ΔLMV_{t-1}		0.679	0.090	*	0.021
ΔROA_{t-1}		-2.781	0.297		-0.004
ΔDTE_{t-1}		0.579	0.002	***	0.010
ΔBTM_{t-1}		-0.221	0.687		-0.003
ΔSAR_{t-1}		0.203	0.373		0.011
$\Delta STOCKLIQ_{t-1}$		1.889	0.574		0.005
$\Delta STOCKVOL_{t-1}$		2.859	0.329		0.009
$\Delta OILPRC_{t-1}$		-0.430	0.187		-0.015
$\Delta OILSTD_{t-1}$		18.778	0.184		0.018
$\Delta PRIMERATE_{t-1}$		-0.183	0.079	*	-0.024
$\Delta PRIMERATEVOL_{t-1}$		-2.396	0.507		-0.013
N		865			
Pseudo-R^2		0.053			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel B shows the results of a logistic regression where the dependent variable is set to 1 (0 otherwise) if firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats ($INCREASE_{i,t}$). The variables of interest are $\Delta OVLPII\_DED_{t-1}$, $\Delta OVLPII\_QIX_{t-1}$ and $\Delta OVLPII\_TRA_{t-1}$, the prior year changes in overlapping dedicated, quasi-indexer and transient institutions (Bushee 1998, 2001), respectively. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range. All other independent variables are lagged changes in the variables defined in Table 1.

TABLE 7

Changes Analysis of Investor Overlap Interacted with Proxies for Uncertainty

Logistic Regression of (INCREASE=1) on Prior Year Change in Investor Overlap ($\Delta OVLPII_{t-1}$) Interacted with Firms' Idiosyncratic Stock Return and Volatility

DEPENDENT VARIABLE: $INCREASE_t$ = 1					
Variable	H4	Coeff.	p-value		Marginal Effect
Intercept		-2.610	<.0001	***	
$\Delta OVLPII_{t-1}$		3.018	0.109		0.016
ΔPIH_{t-1}		-0.302	0.790		-0.002
$\Delta OVLPAN_{t-1}$		-0.281	0.725		-0.002
$\Delta OVLPAUD_{t-1}$		-0.084	0.811		0.000
$\Delta HEDGING_{t-1}$		-0.184	0.774		0.000
$\Delta TRADING_{t-1}$		0.232	0.734		0.000
ΔLMV_{t-1}		0.674	0.087	*	0.021
ΔROA_{t-1}		-2.238	0.392		-0.003
ΔDTE_{t-1}		0.566	0.003	***	0.010
ΔBTM_{t-1}		-0.128	0.796		-0.002
ΔSAR_{t-1}		0.322	0.170		0.018
$\Delta STOCKLIQ_{t-1}$		1.462	0.662		0.004
$\Delta STOCKVOL_{t-1}$		1.401	0.606		0.004
$\Delta OILPRC_{t-1}$		-0.396	0.221		-0.013
$\Delta OILSTD_{t-1}$		14.608	0.300		0.014
$\Delta PRIMERATE_{t-1}$		-0.163	0.118		-0.021
$\Delta PRIMERATEVOL_{t-1}$		-2.697	0.464		-0.014
$UNCERT_{t-1}$		-0.081	0.854		-0.006
$(\Delta OVLPII_{t-1})*(UNCERT_{t-1})$	+	9.079	0.028	**	0.047
N		865			
Pseudo-R^2		0.063			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Table 7 shows the results of logistic regressions where the dependent variable is set to 1 (0 otherwise) if firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats ($INCREASE_{i,t}$). The variable of interest is the interaction term. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range. All other variable definitions are provided in Table 1.

TABLE 8

Changes in Institutional Ownership Conditional on Disclosure Choice

Test for Differences in Mean Change in the Number of Institutional Investors and Their Average Percentage Ownership

		Quarter Prior to 10-K		Quarter After 10-K		Difference		
	N	Avg. # of Inst.	Avg. % shrs Owned	Avg. # of Inst.	Avg. % shrs Owned	Avg. # of Inst.	Avg. % shrs Owned	
INCREASE=1	77	201.2	0.405%	206.1	0.426%	4.9	0.021%	
INCREASE=0	785	181.0	0.434%	185.8	0.437%	4.9	0.004%	
					Difference-in-Difference	0.0	**0.017%**	
					T-Test p-value		**0.088**	*

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively.

Table 8 shows the results of a difference-in-difference test between firm-years in which a firm followed the industry first-mover (INCREASE=1) and firms-years in which the firm did not (INCREASE=0). The pre-period is the most recent calendar quarter prior to a firm's 10-K filing date and the post-period is the calendar quarter immediately after the filing date. The test variables are: i) the change in the average number of institutional investors and ii) the change in the average percentage ownership of each institutional investor.

TABLE 9
Examining the Potential Effect of Herding

Panel A: Logistic Regression of ($MULTIPLE_t$=1) on ($OVLPII_t$) and ($LPRIOR_t$)

DEPENDENT VARIABLE: $MULTIPLE_t$ = 1								
Variable	H1	Coeff.	p-value		Coeff.	p-value		Marginal Effect
Intercept		-1.070	0.384		-4.387	0.006	***	
$LPRIOR_t$		0.844	<.0001	***	0.687	<.0001	***	0.220
$OVLPII_t$	+				3.113	0.004	***	0.138
PIH_t		-1.064	0.141		-0.074	0.920		-0.004
$OVLPAN_t$		0.314	0.548		-0.263	0.631		-0.022
$OVLPAUD_t$		-2.257	0.002	***	-2.273	0.002	***	-0.383
$HEDGING_t$		0.301	0.433		0.397	0.253		0.067
$TRADING_t$		1.040	0.033	**	0.737	0.144		0.124
LMV_t		0.179	0.124		0.236	0.050	**	0.077
ROA_t		-8.359	0.000	***	-7.202	0.001	***	-0.046
DTE_t		-0.110	0.620		0.038	0.847		0.004
BTM_t		-1.241	0.020	**	-0.968	0.060	*	-0.054
$ANNSAR_t$		-0.549	0.002	***	-0.419	0.019	**	-0.032
$AVGMTURN_t$		-1.554	0.435		-2.093	0.298		-0.030
$STDMSAR_t$		1.755	0.577		0.924	0.772		0.008
$LNOILPRC_t$		-0.452	0.214		-0.341	0.362		-0.042
$OILSTD_t$		-5.839	0.491		-3.033	0.728		-0.006
$PRIMERATE_t$		0.085	0.094	*	0.055	0.301		0.031
$PRIMERATESTD_t$		1.197	0.551		1.162	0.581		0.005
N		1,220			1,220			
Pseudo-R^2		0.210			0.229			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel A shows the results of logistic regressions where the dependent variable is set to 1 (0 otherwise) if firm *i* includes multiple quantitative formats in its market risk disclosure for year *t* ($MULTIPLE_{i,t}$). The variable of interest, $LPRIOR_{i,t}$, is measured as the log of the number of firms in the same industry (as firm *i*) that have changed to multiple formats in a prior year. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range (0 to 1 for indicator variables). All other variable definitions are provided in Table 1.

TABLE 9 (Continued)
Examining the Potential Effect of Herding

Panel B: Logistic Regression of (INCREASE=1) on ($\Delta OVLPII_{t-1}$) and ($LPRIOR_t$)

DEPENDENT VARIABLE: $INCREASE_t = 1$								
Variable	H1	Coeff.	p-value		Coeff.	p-value		Marginal Effect
Intercept		-2.957	<.0001	***	-3.189	<.0001	***	
$LPRIOR_t$		0.213	0.125		0.275	0.055	*	0.040
$\Delta OVLPII_{t-1}$	+				5.045	0.010	**	0.026
ΔPIH_{t-1}		-0.316	0.771		-0.252	0.824		-0.002
$\Delta OVLPAN_{t-1}$		-0.077	0.924		-0.359	0.650		-0.003
$\Delta OVLPAUD_{t-1}$		-0.003	0.994		-0.129	0.710		0.000
$\Delta HEDGING_{t-1}$		-0.200	0.738		-0.147	0.797		0.000
$\Delta TRADING_{t-1}$		-0.072	0.906		-0.008	0.990		0.000
ΔLMV_{t-1}		0.849	0.027	**	0.904	0.020	**	0.028
ΔROA_{t-1}		-2.485	0.380		-1.915	0.478		-0.003
ΔDTE_{t-1}		0.624	0.001	***	0.642	0.001	***	0.011
ΔBTM_{t-1}		0.094	0.849		0.075	0.889		0.001
$\Delta ANNSAR_{t-1}$		0.203	0.353		0.205	0.366		0.011
$\Delta AVGMTURN_{t-1}$		0.628	0.849		0.682	0.842		0.002
$\Delta STDMSAR_{t-1}$		4.801	0.118		3.734	0.200		0.011
$\Delta OILPRC_{t-1}$		-0.206	0.560		-0.322	0.370		-0.011
$\Delta OILSTD_{t-1}$		21.555	0.186		26.779	0.117		0.025
$\Delta PRIMERATE_{t-1}$		-0.236	0.025	**	-0.213	0.048	**	-0.028
$\Delta PRIMERATESTD_{t-1}$		0.065	0.988		0.072	0.986		0.000
N		865			865			
Pseudo-R^2		0.046			0.063			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel B shows the results of logistic regressions where the dependent variable is set to 1 (0 otherwise) if firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats ($INCREASE_{i,t}$). The variable of interest, $LPRIOR_{i,t}$, is measured as the log of the number of firms in the same industry (as firm *i*) that have changed to multiple formats in a prior year. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range. All other independent variables are lagged changes in the variables defined in Table 1.

TABLE 10
Examining the Potential Influence of the Second-Movers

Panel A: Logistic Regression of ($MULTIPLE_t$=1) on Level of Investor Overlap with the Industry First-Mover ($OVLPII_t$) and Second-Mover ($OVLPII\_SEC_t$)

DEPENDENT VARIABLE: $MULTIPLE_t$ = 1								
Variable	H1	Coeff.	p-value		Coeff.	p-value		Marginal Effect
Intercept		-3.948	0.004	***	-7.173	<.0001	***	
$OVLPII_t$	+				3.478	0.002	***	0.172
$OVLPII\_SEC_t$		1.224	0.029	**	0.753	0.195		0.073
PIH_t		-0.167	0.820		0.533	0.476		0.036
$OVLPAN_t$		-1.342	0.041	**	-0.486	0.454		-0.046
$HEDGING_t$		0.637	0.094	*	0.617	0.074	*	0.116
$TRADING_t$		0.762	0.140		0.316	0.557		0.059
LMV_t		0.212	0.127		0.204	0.133		0.075
ROA_t		-8.469	0.001	***	-8.137	0.001	***	-0.058
DTE_t		-0.242	0.287		-0.093	0.663		-0.012
BTM_t		-1.093	0.045	**	-0.861	0.103		-0.053
$ANNSAR_t$		-0.469	0.020	**	-0.270	0.193		-0.023
$AVGMTURN_t$		-2.148	0.342		-3.051	0.201		-0.049
$STDMSAR_t$		3.843	0.310		1.400	0.725		0.013
$LNOILPRC_t$		0.662	0.029	**	0.571	0.076	*	0.079
$OILSTD_t$		0.093	0.991		8.565	0.323		0.020
$PRIMERATE_t$		-0.092	0.059	*	-0.051	0.345		-0.032
$PRIMERATESTD_t$		-0.680	0.726		0.442	0.832		0.002
N		1,001			1,001			
Pseudo-R^2		0.145			0.169			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel A shows the results of logistic regressions where the dependent variable is set to 1 (0 otherwise) if firm *i* includes multiple quantitative formats in its market risk disclosure for year *t* ($MULTIPLE_{i,t}$). The variable of interest, $OVLPII\_SEC_{i,t}$, is the number of overlapping institutional investors between firm *i* in industry *k* and the second-mover in industry *k*, scaled by the total number of institutional investors in firm *i*, both measured at December of year *t*. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range (0 to 1 for indicator variables). All other variable definitions are provided in Table 1.

TABLE 10 (Continued)

Examining the Potential Influence of the Second-Movers

Panel B: Logistic Regression of (INCREASE=1) on Prior Year Change in Investor Overlap with Industry First-Mover ($\Delta OVLPII_{t-1}$) and Second-Mover ($\Delta OVLPII\_SEC_{t-1}$)

DEPENDENT VARIABLE: $INCREASE_t = 1$								
Variable	H1	Coeff.	p-value		Coeff.	p-value		Marginal Effect
Intercept		-2.462	<.0001	***	-2.500	<.0001	***	
$\Delta OVLPII_{t-1}$	+				4.887	0.031	**	0.027
$\Delta OVLPII\_SEC_{t-1}$		2.619	0.143		0.987	0.609		0.006
ΔPIH_{t-1}		0.332	0.759		0.608	0.580		0.004
$\Delta OVLPAN_{t-1}$		0.140	0.826		-0.024	0.970		0.000
$\Delta HEDGING_{t-1}$		-0.150	0.795		-0.139	0.804		0.000
$\Delta TRADING_{t-1}$		-0.731	0.284		-0.665	0.328		0.000
ΔLMV_{t-1}		0.687	0.063	*	0.741	0.056	*	0.024
ΔROA_{t-1}		-2.553	0.336		-1.945	0.478		-0.003
ΔDTE_{t-1}		0.631	0.008	***	0.563	0.022	**	0.011
ΔBTM_{t-1}		0.316	0.524		0.399	0.474		0.006
$\Delta ANNSAR_{t-1}$		0.135	0.522		0.140	0.525		0.008
$\Delta AVGMTURN_{t-1}$		2.405	0.527		1.920	0.621		0.005
$\Delta STDMSAR_{t-1}$		4.482	0.181		4.256	0.197		0.014
$\Delta OILPRC_{t-1}$		-0.643	0.149		-0.704	0.118		-0.025
$\Delta OILSTD_{t-1}$		42.061	0.036	**	41.574	0.033	**	0.041
$\Delta PRIMERATE_{t-1}$		-0.285	0.031	**	-0.255	0.050	*	-0.035
$\Delta PRIMERATESTD_{t-1}$		1.703	0.695		0.745	0.864		0.004
N		687			687			
Pseudo-R^2		0.062			0.076			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel B shows the results of logistic regressions where the dependent variable is set to 1 (0 otherwise) if firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats ($INCREASE_{i,t}$). The variable of interest is $\Delta OVLPII\_SEC_{t-1}$, the prior year change in investor overlap with the industry second-mover. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range. All other independent variables are lagged changes in the variables defined in Table 1.

TABLE 11
Analyses of Investor Overlap Partitioned By Size and Type of Institution

Panel A: Logistic Regression of ($MULTIPLE_t$=1) on Level of Investor Overlap Partitioned by Size and Type

DEPENDENT VARIABLE: $MULTIPLE_t = 1$				
Variable	Coeff.	p-value		Marginal Effect
Intercept	-7.675	<.0001	***	
$OVLPII\_LARGE\_DED_t$	18.616	<.0001	***	0.045
$OVLPII\_SMALL\_DED_t$	10.711	0.465		0.007
$OVLPII\_LARGE\_QIX_t$	3.544	0.021	**	0.096
$OVLPII\_SMALL\_QIX_t$	2.123	0.329		0.040
$OVLPII\_LARGE\_TRA_t$	6.220	0.017	**	0.073
$OVLPII\_SMALL\_TRA_t$	2.166	0.613		0.016
PIH_t	0.046	0.948		0.003
$OVLPAN_t$	-0.688	0.201		-0.059
$OVLPAUD_t$	-2.514	0.000	***	-0.434
$HEDGING_t$	0.477	0.160		0.082
$TRADING_t$	0.603	0.204		0.104
LMV_t	0.433	0.010	**	0.146
ROA_t	-10.057	<.0001	***	-0.066
DTE_t	0.051	0.800		0.006
BTM_t	-1.018	0.057	*	-0.058
$ANNSAR_t$	-0.444	0.009	***	-0.035
$AVGMTURN_t$	-2.933	0.123		-0.043
$STDMSAR_t$	1.262	0.693		0.011
$LNOILPRC_t$	0.657	0.009	***	0.083
$OILSTD_t$	-1.771	0.840		-0.004
$PRIMERATE_t$	-0.086	0.073	*	-0.051
$PRIMERATESTD_t$	0.277	0.899		0.001
N	1,220			
Pseudo-R^2	0.214			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel A shows the results of a logistic regression where the dependent variable is set to 1 (0 otherwise) if firm *i* includes multiple quantitative formats in its market risk disclosure for year *t* ($MULTIPLE_{i,t}$). The independent variables of interest are overlapping institutional investors partitioned by both size and type: OVLPII_LARGE_DED, OVLPII_SMALL_DED, OVLPII_LARGE_QIX, OVLPII_SMALL_QIX, OVLPII_LARGE_TRA, and OVLPII_SMALL_TRA. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range (0 to 1 for indicator variables). All other variable definitions are provided in Table 1.

TABLE 11 (Continued)

Analyses of Investor Overlap Partitioned By Size and Type of Institution

Panel B: Logistic Regression of ($INCREASE_t$=1) on Prior Year Change in Investor Overlap Partitioned by Size and Type

DEPENDENT VARIABLE: $INCREASE_t = 1$				
Variable	Coeff.	p-value		Marginal Effect
Intercept	-3.203	<.0001	***	
ΔOVLPII_LARGE_DED$_{t-1}$	11.174	0.093	*	0.010
ΔOVLPII_SMALL_DED$_{t-1}$	-5.577	0.784		0.000
ΔOVLPII_LARGE_QIX$_{t-1}$	4.528	0.015	**	0.019
ΔOVLPII_SMALL_QIX$_{t-1}$	7.075	0.115		0.015
ΔOVLPII_LARGE_TRA$_{t-1}$	5.578	0.056	*	0.014
ΔOVLPII_SMALL_TRA$_{t-1}$	2.594	0.596		0.001
ΔPIH$_{t-1}$	-0.306	0.786		-0.001
ΔOVLPAN$_{t-1}$	-0.400	0.616		-0.003
ΔOVLPAUD$_{t-1}$	-0.332	0.444		0.000
ΔHEDGING$_{t-1}$	-0.211	0.716		0.000
ΔTRADING$_{t-1}$	-0.022	0.973		0.000
ΔLMV$_{t-1}$	0.883	0.024	**	0.022
ΔROA$_{t-1}$	-2.327	0.391		-0.004
ΔDTE$_{t-1}$	0.683	0.001	***	0.011
ΔBTM$_{t-1}$	-0.143	0.800		-0.005
ΔANNSAR$_{t-1}$	0.197	0.384		0.012
ΔAVGMTURN$_{t-1}$	1.069	0.759		0.005
ΔSTDMSAR$_{t-1}$	3.370	0.262		0.008
ΔOILPRC$_{t-1}$	-0.384	0.327		-0.013
ΔOILSTD$_{t-1}$	29.235	0.088	*	0.017
ΔPRIMERATE$_{t-1}$	-0.231	0.035	**	-0.027
ΔPRIMERATESTD$_{t-1}$	-0.390	0.926		-0.014
N	865			
Pseudo-R^2	0.065			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel B shows the results of a logistic regression where the dependent variable is set to 1 (0 otherwise) if firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats ($INCREASE_{i,t}$). The independent variables of interest are the prior year change in overlapping institutional investors partitioned by both size and type: ΔOVLPII_LARGE_DED, ΔOVLPII_SMALL_DED, ΔOVLPII_LARGE_QIX, ΔOVLPII_SMALL_QIX, ΔOVLPII_LARGE_TRA and ΔOVLPII_SMALL_TRA. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range. All other independent variables are lagged changes in the variables defined in Table 1.

TABLE 12

Stock Return Sensitivities to an Industry Factor

Panel A: Regression of Monthly Stock Returns on Returns of the Market and Oil Prices for Energy Firms

DEPENDENT VARIABLE: R_t			
Variable	Coeff.	p-value	
Intercept	0.021	<.0001	***
Rm_t	0.548	<.0001	***
Ro_t	0.205	<.0001	***
Ro_t*$MULTIPLE_t$	-0.042	0.467	
N	4,224		
Adjusted-R^2	0.051		

Panel B: Regression of Monthly Stock Returns on Returns of the Market and Interest Rate Changes for Financial Firms

DEPENDENT VARIABLE: R_t			
Variable	Coeff.	p-value	
Intercept	0.007	<.0001	***
Rm_t	0.401	<.0001	***
ΔRf_t	0.054	0.004	***
ΔRf_t*$MULTIPLE_t$	-0.018	0.442	
N	10,367		
Adjusted-R^2	0.072		

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm.

Panel A shows the results of regressing energy firms' monthly stock returns ($R_{i,t}$) on the monthly returns of the CRSP equal-weighted index (Rm_t), the monthly returns on oil prices (Ro_t), and the interaction of Ro_t with an indicator variable ($MULTIPLE_{i,t}$) set to 1 (0 otherwise) for the months within a firm's fiscal year that includes multiple quantitative formats in the 10-K. Panel B shows the results of regressing financial, brokerage and REIT firms' monthly stock returns on the monthly returns of the market index, the monthly percentage change in the 3-month Treasury Bill (ΔRf_t), and the interaction of ΔRf_t with $MULTIPLE_{i,t}$.

TABLE 13

Analyses of Investor Overlap Using an Instrumental Variables Approach

Panel A: Logistic Regression of ($MULTIPLE_t$=1) on Fitted Investor Overlap ($OVLPII\_HAT_t$)

DEPENDENT VARIABLE: $MULTIPLE_t$ = 1					
Variable	H1	Coeff.	p-value		Marginal Effect
Intercept		-7.631	<.0001	***	
$OVLPII\_HAT_t$	+	4.868	0.010	***	0.220
PIH_t		0.701	0.555		0.043
$OVLPAN_t$		-0.920	0.327		-0.080
$OVLPAUD_t$		-2.661	0.037	**	-0.462
$HEDGING_t$		0.548	0.336		0.095
$TRADING_t$		0.537	0.480		0.093
LMV_t		0.296	0.129		0.100
ROA_t		-5.608	0.097	*	-0.037
DTE_t		0.091	0.663		0.011
BTM_t		-0.852	0.287		-0.049
$ANNSAR_t$		-0.424	0.105		-0.034
$AVGMTURN_t$		1.132	0.822		-0.054
$STDMSAR_t$		-3.640	0.233		0.010
$LNOILPRC_t$		0.619	0.139		0.079
$OILSTD_t$		-0.574	0.968		-0.001
$PRIMERATE_t$		-0.084	0.231		-0.050
$PRIMERATESTD_t$		0.272	0.941		0.001
N		1,220			
Pseudo-R^2		0.209			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm and adjusted for the two-stage approach.

Panel A shows the results of a two stage regression and are comparable to the results from Table 4 Panel A. In the first stage, investor overlap ($OVLPII_{i,t}$) between firm *i* in industry *k* and the first-mover in industry *k* is regressed on differences in each firm's idiosyncratic stock returns (DSAR), stock volatility (DSTOCKVOL) and share turnover (DSTOCKLIQ). The final instrumental variable is the ratio of equity fund flows for the year divided by total equity assets at the beginning of the year (EQFUNDFLOWS_CHG), based on data from the National Association of U.S. Investment Companies. Also included in the first stage regression are all the covariates from the second stage regression. In the second stage, the dependent variable is set to 1 (0 otherwise) if firm *i* includes multiple quantitative formats in its market risk disclosure for year *t* ($MULTIPLE_{i,t}$) and the fitted value of investor overlap (OVLPII_HAT) is substituted for actual investor overlap. The marginal effect column shows each variable's mean marginal effect multiplied by its inter-quartile range (0 to 1 for indicator variables). All other variable definitions are provided in Table 1.

TABLE 13 (Continued)
Analyses of Investor Overlap Using an Instrumental Variables Approach

Panel B: Logistic Regression of ($INCREASE_t$=1) on Prior Year Change in Fitted Investor Overlap ($\Delta OVLPII\_HAT_{t-1}$)

DEPENDENT VARIABLE: $INCREASE_t$ = 1					
Variable	H1	Coeff.	p-value		Marginal Effect
Intercept		-2.495	<.0001	***	
ΔOVLPII_HAT$_{t-1}$	+	3.193	0.075	*	0.015
ΔPIH$_{t-1}$		-0.369	0.723		-0.002
ΔOVLPAN$_{t-1}$		-0.172	0.826		-0.001
ΔOVLPAUD$_{t-1}$		0.155	0.752		0.000
ΔHEDGING$_{t-1}$		-0.244	0.694		0.000
ΔTRADING$_{t-1}$		0.281	0.634		0.000
ΔLMV$_{t-1}$		0.839	0.056	*	0.027
ΔROA$_{t-1}$		-1.006	0.645		-0.001
ΔDTE$_{t-1}$		0.097	0.066	*	0.002
ΔBTM$_{t-1}$		0.145	0.437		0.002
ΔANNSAR$_{t-1}$		-0.058	0.694		-0.003
ΔAVGMTURN$_{t-1}$		3.484	0.080	*	-0.001
ΔSTDMSAR$_{t-1}$		-0.403	0.789		0.011
ΔOILPRC$_{t-1}$		-0.438	0.191		-0.015
ΔOILSTD$_{t-1}$		17.136	0.199		0.017
ΔPRIMERATE$_{t-1}$		-0.162	0.095	*	-0.022
ΔPRIMERATESTD$_{t-1}$		-1.533	0.663		-0.008
N		865			
Pseudo-R^2		0.030			

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors clustered by firm and adjusted for the two-stage approach.

Panel B shows the results of a two stage regression and are comparable to the results from Table 4 Panel B. The dependent variable is set to 1 (0 otherwise) if firm *i* increased its year *t* market risk disclosure from the prior year to include multiple quantitative formats ($INCREASE_{i,t}$). The variable of interest is $\Delta OVLPII\_HAT_{t-1}$, the prior year change in fitted investor overlap. All other independent variables are lagged changes in the variables defined in Table 1.

TABLE 14
Hazard Model Estimation

Panel A: Descriptive Statistics of Dependent Variable: TIME

Variable	N	Mean	Std. Dev.	Min	Q1	Median	Q3	Max
$TIME_t$	77	4.117	2.259	1.000	2.000	4.000	5.000	9.000

Panel B: Hazard Rate Estimation of TIME on Prior Year Change in Investor Overlap ($\Delta OVLPII_{t-1}$)

DEPENDENT VARIABLE: $TIME_t$				
Variable	H1	Coeff.	p-value	
$\Delta OVLPII_{t-1}$	+	4.950	0.050	*
ΔPIH_{t-1}		-0.163	0.892	
$\Delta OVLPAN_{t-1}$		-0.307	0.663	
$\Delta OVLPAUD_{t-1}$		-0.144	0.684	
$\Delta HEDGING_{t-1}$		0.060	0.916	
$\Delta TRADING_{t-1}$		-0.617	0.411	
ΔLMV_{t-1}		1.134	0.004	***
ΔROA_{t-1}		0.005	0.999	
ΔDTE_{t-1}		0.618	0.005	***
ΔBTM_{t-1}		0.869	0.129	
ΔSAR_{t-1}		0.138	0.593	
$\Delta STOCKLIQ_{t-1}$		-1.790	0.626	
$\Delta STOCKVOL_{t-1}$		6.727	0.073	*
$\Delta OILPRC_{t-1}$		0.240	0.668	
$\Delta OILSTD_{t-1}$		108.380	0.007	***
$\Delta PRIMERATE_{t-1}$		-0.714	0.002	***
$\Delta PRIMERATEVOL_{t-1}$		13.135	0.093	*
N		865		
Pseudo-R^2		0.118		

*, **, *** Significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively, using a two-tailed test and standard errors based on the robust sandwich covariance matrix of Lin and Wei (1989) that is robust to model mis-specification.

Table 14 shows the results from a hazard model estimation where the dependent variable is the number of years (TIME) after an industry first-mover's decision to include multiple formats in its market risk disclosure that it takes for firm *i* to also increase the number of formats in its market risk disclosure. If firm *i* never increases the number of formats, then the firm is considered a right-censored observation. Panel A shows descriptive statistics of the dependent variable, conditional on a firm not being right-censored. Panel B shows the results of the hazard model estimation. The variable of interest is $\Delta OVLPII_{t-1}$, the prior year change in investor overlap. All other independent variables are lagged changes in the variables defined in Table 1.