

## ABSTRACT

Title of Dissertation: MULTIPLE AUDIENCES AND CORPORATE DISCLOSURE

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This study contributes to literature in three ways: first, it draws a full picture about the determinants of a firm's voluntary disclosure decision; second, it aims at tackling the mixed results found about the relation between competition and disclosure; and third, it shows evidence that it is possible that a firm would change its disclosure behaviors across time.

The examination is based on the concept that management's communication could reach out to multiple audiences. While a firm could be concerned about the responses from investors and competitors when deciding disclosure-or-not, union and government could also come into consideration. In addition, how the concern about competitors would affect a firm's voluntary disclosure could depend on different interpretations about competition. Whether a firm is thinking of the abnormal profit that it has earned or the cost advantage that it has possessed, different interpretations about competition result in different predictions about the relation between

competition and disclosure, and this could have caused mixed results in previous studies.

Measuring a firm's disclosure level by the number of information items disclosed within a year, I found that a firm would disclose less in the face of a union's bargaining power and the litigation threat from outside blockholders. Such concerns are even more salient when it comes to revealing proprietary information.

In addition, I found that a larger firm would disclose more information about itself, proprietary or not. Higher incentives for a large firm to give more information might come from both demand and supply of information about it.

Furthermore, after controlling for other factors, I only found evidence that supports the argument that less competition (in the sense of market power) would cause less disclosure. The results did not, however, show that a firm facing more competition (in the sense of barriers to entry) would choose to disclose less.

Finally, the findings also indicated that a firm's disclosure policy could be not as "sticky" as claimed in previous studies, especially when it comes to disclosing proprietary information. A firm might change its attitudes towards disclosure in the face of different political environment.

MULTIPLE AUDIENCES AND CORPORATE DISCLOSURE

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# Dedication

To Olivia, Guan-Ming, and my parents

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## Chapter 1: Introduction

Management's communication to the public reaches out to various audiences. Investors, consumers, government, competitors, and labor union, to name a few, are the parties that are influenced by managers' information dissemination. Therefore, when a firm has the option to disclose certain private information, it may consider the impact such information would have on all the audiences and how the reaction from all the audiences would in turn affect the firm. In other words, a firm needs to trade off between benefits and costs when it makes a disclosure-or-not decision.

Verrecchia (1983) points out such a concept. In his seminal work, Verrecchia argues that, given the advantages and incentives of full disclosure, a firm might still withhold the information, even if it is favorable, due to possible harm that competitors, employees or the government would do to the firm by utilizing the information that the firm reveals. The costs arising from disclosing such information, which is proprietary in nature, is referred to as proprietary costs (p.181). He further exemplifies possible sources of proprietary costs (p.182): it might come from a union since the union would tend to make fewer labor concessions if the union knows that the firm expects to prosper in the future; it might come from competitors given that a firm within highly competitive industries would be more reluctant to disclose favorable news because of highly competition pressure; it might come from the government given that a firm within a political sensitive industry would be hesitant to divulge good news due to the possibility of attracting political attention.

Even with Verrecchia's broad definition of proprietary costs, it is surprising that no study has empirically and thoroughly examined on whether a firm actually takes into account of multiple audiences when making disclosure decision. Most follow-up empirical works have limited the determinant of disclosure to competitors. For example, Clarkson et al. (1994), Harris (1998), Gleason (1998), Piotroski (1999) and Botosan and Harris (2000), using various proxies for competition pressure, seek to solve the puzzle about how competition would affect a firm's disclosure. They focus on disclosure decisions about whether to make management forecasts or how precisely to disclose segment information. Other studies that interpret the source of proprietary costs as coming from more than or other than competitors include, for example, Scott (1994) and Bhojraj et al. (2004). Scott (1994) examines how the consideration about the relations with a union (e.g., strike history) would affect how much detail a firm would be willingly to disclose about its defined benefit pension plan. On the other hand, Bhojraj et al. (2004) investigate the effects of industry regulators on firms' decision of voluntary disclosure within the electric utility industry only. It is still not clear that, what role each target audience would play in disclosure decision, with all the possible target audiences intertwining.

In addition, the findings about how competition would affect a firm's disclosure decision are still mixed. Verrecchia (1983) suggests firms within a highly competitive industry would be more reluctant to disclose favorable news. Darrrough and Stoughton (1990), on the other hand, predict more competition from increasing possibility of entry would induce firms to disclose more private information. Later archival works find results that support either of the arguments. Harris (1998),

Gleason (1998), and Botosan and Harris (2000) claim and find that firms within a less competitive industry would be less likely to report segment information in detail. In other words, their findings are more aligned with Darrough and Stoughton's prediction. In contrast, Clarkson et al. (1994) and Piotroski (1999), using different measures of competition, find that competitive pressure restricts a firm from exposing more proprietary information, which is more consistent with Verrecchia's statement.

A possible reason for the different findings, as implicitly implied in Piotroski (1999), is that Harris (1998) only looks at the cost side of disclosure and fails to control for the benefits of disclosure a firm faces. In other words, failure to consider the benefits of disclosure could give rise to the mixed finding. Another possible reason, which is not indicated in previous literature, is that the usage of different competition proxies, which interpret competition differently, either at industry level or at firm level, could also cause puzzling results.

Therefore, this study tries to fill the void by studying: 1) how the consideration of multiple audiences could possibly change a firm's voluntary disclosure decision; and 2) how the use of different competition proxies, which give different interpretation about competition, either at industry level or at firm level, could possibly lead to different results about the relation between competition and disclosure in previous studies.

It is important to take into account of multiple audiences when investigating a firm's decision process of voluntary disclosure. It gives a complete picture about how having all the relevant audiences in mind would actually encourage or discourage a firm's disclosure decision. On the one hand, a firm would need to

consider investors' reactions to its announcement. If it is going to issue equity in the near future and if the information asymmetry between the firm and the investors is high (so the cost of raising capital is high), the firm could have incentive to reveal more news so as to drive down the information asymmetry. However, the firm does not necessarily want to disclose all the news to the investors. In other words, the firm might want to restrict the volume of information released, whether it is good news or bad news, due to the possibility of litigation. If it is bad news, the firm could be concerned that its disclosure would trigger a class action from the investors<sup>1</sup>. If it is good news, such as news that the sales volume of one of the firm's products has reached the highest level among all years, the firm could still worry about the possibility of exaggerating its financial condition and inflating its stock price. Releasing good news would not cause litigation itself. However, if at the end of period the financial results of the firm turn out to be slightly worse than investors would have expected, the good news that the firm has released during the period would become powerful evidence that investors could claim against the firm in a class action.

On the other hand, the firm is concerned about the responses from competitor, government, or union if it is to disseminate critical information about the firm. For example, a pharmaceutical company might hesitate to reveal the stage of development of its new drug. Its competitor, by knowing such information, has incentive to accelerate the development progress and file for approval even earlier than the

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<sup>1</sup> In previous studies, how the consideration of investors' litigation action would affect the firm's voluntary disclosure decision has two sides of arguments. Skinner (1994) asserts that managers can reduce shareholder litigation costs by disclosing adverse news early. Francis et al. (1994), on the other hand, find that preemptive disclosure does not deter litigation completely.

company. A retailing company would not release the information about merger until the deal is clear since it doesn't want to draw unnecessary attention from the Federal Trade Commission. An auto company might be unwillingly to disclose more favorable financial information (such as sales or net income) in the face of incoming labor contract renegotiation since this gives incentive to the union to bargain for a greater wage increase.

In this study, I set up a model based on Verrecchia's (1983) conceptual framework to test whether a firm considers multiple audiences in its voluntary disclosure decision. To measure disclosure level, I focus on the number of information items a firm is willing to discuss in its announcements within a year. Following Miller (2002), types of information items vary from earnings forecasts, sales forecasts, preliminary announcements of annual sales, announcements of major contracts, announcements of stock repurchase to announcements of appointment of a board director. I also further refine information items to those that are more proprietary in nature, according to the definition given by Dye (1985). Such information is more likely to leak a firm's strategic value. Therefore, the firm would be highly concerned if it were to release such information.

I choose all firms, except firms within the industries with SIC codes 4000-4999 and 6000-6999<sup>2</sup>, as my initial sample firms. In other words, I delete firms within the industries that were once under regulation. Firms within such industries were under different regulatory pressure so they may exhibit different disclosure behaviors. I focus on only one year (year 2001) and collect data cross-sectionally as opposed to

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<sup>2</sup> Industries with SIC codes 4000-4999 include transportation, communication, electric, gas and sanitary services, while industries with SIC codes 6000-6999 are industries of finance, insurance, and real estate.

across time to increase the variability in disclosure variable. After applying for several criteria about data availability, the final number of firms used in the test is 157, within 25 industries.

The results show that a firm facing higher potential threat from investors' litigation would restrain itself from revealing more news, no matter the news is proprietary or not. The results also indicate that in an industry in which the union has more bargaining power, a firm tends to disclose less information. Furthermore, the results provide evidence that a larger firm would be more likely to disclose more about itself, proprietary or not. Finally, the results point out that a firm facing higher potential political scrutiny would choose to reveal less information in general, particularly in the period that overall political environment is less sensitive.

With regard to the relation between competition and disclosure, the results provide supports on the argument that less competition, in the sense of market power, leads to less disclosure. On the contrary, I do not find evidence that after controlling for the consideration of all possible audiences, more competition in the sense of barriers to entry would actually discourage disclosure.

To further investigate whether a firm's disclosure policy is as "sticky" as claimed in prior literature and to further examine whether how the consideration about multiple audiences in disclosure decision would change across time, I also collect data of a randomly-selected sample with 60 firm observations for another year, i.e., year 2002. The results show that actually in terms of revealing proprietary information, a firm's policy might be not as "sticky" as thought in previous studies. Furthermore, the results indicate that in year 2002 possibly due to Enron's bankruptcy

filing in late 2001 and thus an increase in regulatory requirements from the government, corporate firms show their tendency to disclose more if they are more politically sensitive.

Two related studies should be mentioned. Gleason (1998) uses the Lerner Index, which she claims shows the combination of various forces such as suppliers, consumers, competitors and the government, and examines how it would affect segment reporting decision. However, it would be difficult, if not impossible, to see how *each* force influences disclosure decision. Lang and Lundholm (1993) look at the issue that, cross-sectionally what determines analyst ratings of firms' disclosure. Although analyst ratings consider various aspects of corporate disclosure, including annual reports, quarterly report, and press release, it measures analysts' perception of firms' disclosure, not firms' disclosure itself.

This study contributes to the literature by: 1) giving a general and complete picture about what determines firms' voluntary disclosure decision, especially the forces coming from government and union; 2) trying to provide another answer to the mixed results found about the relation between competition and disclosure; and 3) documenting evidence that it is possible that firms change their disclosure behaviors across time.

The rest of study is organized as follows. Chapter 2 gives a discussion about theoretical background based on Verrecchia (1983) and provides a review of related literature. Chapter 3 develops the hypotheses. Chapter 4 describes methodology and procedure of sample selection and data collection. Chapter 5 presents empirical results and Chapter 6 concludes.



## Chapter 2: Literature Review

In this section, I first describe theoretical concepts based on Verrecchia's (1983) work. I then review the studies that are related to the benefits of disclosure and the costs of disclosure separately.

### Theoretical Background

Verrecchia's (1983) main argument is that the existence of a proprietary cost prevents full disclosure, while the proprietary cost is defined as "the cost associated with disclosing information which may be proprietary in nature, and therefore potentially damaging" (p.181). In the absence of the proprietary cost, investors could infer withholding information as having bad news in a company. Therefore, managers would follow a policy of full disclosure. With the existence of the proprietary cost, given that the information is withheld, the investors could not distinguish whether it is because the information is bad news or the information is simply not good enough to be disclosed.

Verrecchia illustrates his concept of the proprietary cost:

It seems apparent that there would be a proprietary cost associated with releasing information which is unfavorable to a firm (e.g., a bank would be tempted to ask for repayment of its loan). However, the release of a variety of accounting statistics about a firm (e.g., sales, net income, cost of operation, etc.) may be useful to competitors, shareholders, or employees in a way which is harmful to a firm's prospects even if (or perhaps because) the information is favorable. One recent example of this is the response of the UAW (United Auto Workers) for fewer labor concessions in the face of an announcement by Chrysler Corporation's chairman that firm's fortunes had improved. Other examples might include the reluctance of managers in certain highly competitive industries, such as personal computers or airlines, or certain

politically sensitive industries, such as the oil industry or foreign automobile importers, to disclose favorable accounting data. (pp.181-182)

Therefore, Verrecchia implies that the source of the proprietary cost could come from union, competitor or government. Altogether they comprise the forces that restrain the firm from revealing all the information.

### *Benefit of disclosure consideration*

Previous studies provide theoretical arguments or empirical evidence about how a firm would take into account the activities within capital markets in its disclosure decision. For example, Barry and Brown (1985, 1986) show that when less information is available about certain securities, such securities would be perceived as having greater risk and requiring excess returns. A firm, to reduce risk premium, could do so through more disclosure about its activities. Myers and Majluf (1984) claim that when firms have information that investors do not have, given that firms have some financial slacks, if firms decide to issue new stock, investors would interpret this as bad news or less good news. Investors would not be willing to pay high prices for such stock. Diamond and Verrecchia (1991) assert that more disclosure to reduce information asymmetry brings in a higher stock price, which means a lower cost of capital. Such an increase in stock price from increased disclosure would be more salient in larger firms.

Thus, a firm could increase its disclosure due to the concern of information asymmetry between the firm and the investors. If it is going to issue stock, the firm has incentive to enhance its communication to the public to reduce the information asymmetry and gain a reduction of cost of capital.

In addition to the concern about information asymmetry between the firm and the investors, a firm may have incentive to increase its voluntary disclosure activities simply because of its equity offering in the near future. Lang and Lundholm (1993) investigate what would affect the level of analysts' ratings of firms' disclosure. Analysts evaluate firms' disclosure activities from three aspects: annual reports, other publications, and firms' investor relations. Among the factors they examine, which include firm size, firm performance and security issuance, they find that if a firm is going to issue debt or equity in the current year or in the next two years, the firm enjoys higher analysts rating, which implies that the firm might be more active in its disclosure activities.

In a subsequent paper, Lang and Lundholm (2000) find that issuing firms dramatically increase their disclosure activity beginning six months before the offering. Using the disclosure data collected from newswire, which includes all the management communications such as management forecasts, preliminary quarterly earnings announcements, announcements of new products, etc., they find that the increase in disclosure activity is more obvious in the disclosure category in which managements have the most discretion (e.g., managements expand and explain in details about what cause earnings increase). The increase is still significant after controlling for the firm's current and future earnings performance.

However, focusing only on management forecasts, Frankel et al. (1995) did not find evidence that firms financing externally are more likely to forecast in the period shortly before an offering. Although they find the firms financing externally tend to forecast more often than the firms not financing externally, such a tendency exists

throughout all the event periods, rather than just in the period immediately before financing. They argue that it is possible that forces such as legal liability deter the financing firms from more frequent forecast around the time of an actual offering.

Increased disclosure could lead to a reduction of capital. Such a relation has been documented in previous literature. For example, Botosan (1997), using a self-constructed measure of disclosure level, which is based on voluntary disclosure provided in the annual reports of a sample of manufacturing firms in year 1990, finds that greater disclosure is associated with a lower cost of equity capital, for firms with low analyst following. In addition, Sengupta (1998) provides evidence that firms with high disclosure ratings enjoy a lower cost of issuing debt. Using ratings published from the Association for Investment Management and Research (AIMR), he finds that both bondholders and underwriters examine corporate disclosure policy in estimating the risk premium to charge.

In summary, a firm could expand its voluntary disclosure because of the concern about reducing information asymmetry. It could also possibly extend the disclosure due to the incoming equity offering.

#### *Cost of disclosure consideration*

With broad definition of proprietary costs by Verrecchia (1983), most of follow-up works emphasize on proprietary costs from product market competition. However, even the influence from competition on firms' disclosure is obvious, it is still not clear in which direction competition would affect disclosure.

Theoretical works produce different predictions about the relation between competition and disclosure. Verrecchia's (1983) view is that firms in a highly competitive industry would tend to disclose less favorable news. In other words, he predicts more competition discourages disclosure. However, Darrough and Stoughton's (1990), viewing the cost of disclosing proprietary information as an increased probability of entry, claim that more competition could actually encourage disclosure. Verrecchia (1990) tries to provide an explanation about different predictions. He argues that different predictions may come from different assumptions about the nature of competition. In other words, Darrough and Stoughton's (1990) model considers only pre-entry competition while Verrecchia (1983) implicitly discusses post-entry competition. He states that "(c)ommon sense would seem to suggest that post-entry competition thwarts voluntary disclosure..."

Even the common sense seems to suggest that post-entry competition constrains voluntary disclosure, empirical works still find mixed results. Harris (1998), using two measures of industry competition, which are the four-firm concentration ratio and a measure of the speed of profit adjustment, finds that operations in less competitive industries are less likely to be reported as an industry segment. In other words, her results are more consistent with Darrough and Stoughton's prediction. She argues that "the segment disclosure choice differs from the annual voluntary disclosures considered in (Verrecchia's (1983)) models. The consistency requirements in SFAS No. 14 preclude changing segment definitions each period in response to observed earnings; thus, the segment choices represent long-run disclosure *policy* rather than annual disclosure choices." (p.124)

Botosan and Harris (2000) also find a similar relation. They claim that in a less competitive industry, in which excess profits (i.e., monopoly profits) are more likely to exist, managers, to protect their existing monopoly profits, would tend to disclose less frequently about the segment activities. Using four-firm concentration ratio to measure competition, their results support their prediction.

Gleason (1998) also documents a positive relation between competition and disclosure. She uses the Lerner Index to measure a firm's market power. Theoretically, the Lerner Index is affected by multiple forces, including competitors, suppliers or the government. She estimates the Lerner Index as  $(\text{sales} - \text{cost of goods sold} + \text{depreciation}) / \text{sales}$ . In the paper, she claims that a lower value of the Lerner Index indicates that the firm operates in a more competitive environment. She finds evidence that when a firm operates in a less competitive environment, the firm is less likely to voluntarily disclose segment information before it was required by the Securities and Exchange Commission (SEC).

In contrast, Clarkson et al, (1994) and Piotroski (1999) find competition thwarts voluntary disclosure. Clarkson et al. (1994) view competition coming from barriers to entry. They use the ratio of property, plant, and equipment to total assets to measure such a force. If the ratio is high, a firm enjoys higher barriers to entry. They find that with lower barriers to entry, good (bad) news firms are less (more) likely to include earnings forecast within their annual reports. In other words, more competition, which takes the form of lower barriers to entry, discourages (encourages) firms from revealing favorable (unfavorable) news.

Piotroski (1999) also documents that competition affects firms' disclosure negatively. He uses return on equity, firm size and industry performance diversification to measure the effects from competition. Each of them approximates expected future profitability, barriers to entry, and industry opportunities, respectively. He finds that higher return on equity, bigger firm size, and less diversified industry performance are related to a firm's willingness to disclose more fully about its segment activities. In other words, his results show that proprietary costs are increasing in competition and thus competition discourages firms from disclosure.

These two studies, i.e., Clarkson et al. (1994) and Piotroski (1999), control for financial valuation factor that a company might have in mind. While investigating the effect of competition, they also consider how the capital market consideration would impact disclosure decision. This is different from Harris (1998), which doesn't include valuation factor. However, Gleason (1998) and Botosan and Harris (2000), also controlling for the consideration of benefits of disclosure, still find evidence that less competition leads to less disclosure.

One major difference in these studies is that they use different proxies to measure the competition factor. Each of these proxies interprets the competition factor from different perspectives. In addition, gross property, plant and equipment, the Lerner Index, return on equity, firm size, and industry performance diversification measure competition based on firm level, while four-firm concentration ratio and the speed of profit adjustment measure competition at the industry level. Table 1 summarizes and compares the studies that investigate the relation between competition and disclosure.

While most of the previous studies emphasize on the competition aspects of proprietary costs, Scott (1994) looks at the source of proprietary costs coming from a labor union. He uses three measures to account for the effect from labor relations: number of strikes in the previous three years, average weekly wage rate for hourly workers, and firm's average return on assets versus industrial average return on assets. His finding is that consideration of labor relations would cause a firm to disclose in less detail about its defined benefit pension plan.

Bhojaraj et al. (2004) is another study that interprets the source of proprietary costs as coming from more than competition. Specifically focusing on the electric utility industry only, they consider industry regulators as a potential target audience, in addition to product market competitors. Their results show that such regulatory concerns restrain a firm from disclosing more about its strategies to protect the firm's existing customer base and its plans to exploit emerging opportunities under deregulation.

Even though Verrecchia (1983) did not discuss the possibility that litigation could cause a firm to restrict its disclosure, such a relation is found in prior research. The relation exists; however, the direction of the relation is not certain. Skinner (1994) argues that one of the reasons that a firm voluntarily discloses bad news is to avoid litigation costs. He finds that very bad news is preempted most often. In other words, his results support the idea that a firm would be more willing to issue management forecasts given the concern that no warning about the incoming negative earnings surprise would be more likely to cause shareholders to sue. Skinner (1997) also finds evidence that more timely disclosure is associated with lower settlement



amounts. However, inconsistent with the idea that managers could reduce stockholders' litigation by disclosing adverse earnings news early, he finds that voluntary disclosure occurs more frequently in quarters that result in litigation than in quarters that do not. In other words, disclosing more often might not help the firm avoid the lawsuit.

Francis et al. (1994) argue against Skinner's (1994) projection. By comparing at-risk firms (i.e., firms that are in high-tech industries and experience severe declines in earnings or sales) and litigation firms (i.e., firms that actually are involved in a shareholder lawsuit), they find results opposite to Skinner's (1994) prediction. Specifically, they find most of the litigation are based on an earnings forecast or a preliminary earnings announcement, not on an earnings announcement. Meanwhile, for most of the at-risk firms, adverse earnings news is not disclosed until the date of earnings announcement. Therefore, they conclude that pre-disclosure does not appear to deter litigation. However, they suggest that "prior and concurrent disclosures may sometimes reduce the severity of litigation if not its incidence" (p.140).

Field et al. (2005) aim at reconciling the mixed evidence on whether voluntary disclosure of bad news would deter or trigger litigation. Using a simultaneous equations methodology, they find that firms with higher litigation risk are more likely to make disclosure. However, using prior disclosure as an instrument variable, they find no evidence that disclosure would trigger or deter litigation. After excluding dismissed lawsuits from their sample, their results show that "a firm could potentially lower its expected litigation risk by issuing an earnings warning" (p.505). Nevertheless, in their study, using prior disclosure as an instrument variable could be

problematic since a firm could face different pressure about disclosure in the year with litigation as opposed to in the prior year without litigation. Therefore, prior disclosure decision might be not as correlated with current disclosure decision as claimed in Field et al.

### Chapter summary

In summary, previous studies have provided partial evidence about a possible role that a competitor, a union *or* the government could play in influencing a firm's disclosure decision. A complete picture about the consideration of all potential target audiences into disclosure decision is still lacking. In addition, previous theoretical and empirical works have produced different predictions about the relation between product market competition and voluntary disclosure. One stream of studies suggests that more competition would lead to less disclosure, while the other argues that less competition would actually cause less disclosure. Furthermore, how the concern about the possibility of being sued would affect a firm's disclosure decision is still mixed.

## Chapter 3: Hypothesis Development

In this section, I develop hypotheses about what and who will influence a firm's voluntary disclosure decision. Investors, competitors, union and government are the parties that a firm might have in mind when deciding disclosure or not.

### Investors

Investors' perception about a firm's stock is important to a firm since this is related to how much investors are willing to pay for the firm's stock. If there is more uncertainty about the value of the stock, investors would ask for more risk premium, i.e., they would be reluctant to pay a high price to buy such a stock.

Managers could reduce such an uncertainty by revealing the information that investors do not have. By disseminating managers' private information that is not required to be disclosed, information asymmetry between managers and investors decreases. Once information asymmetry between managers and investors is resolved, cost of raising capital can be reduced.

Such a concern about investors' perception is even more salient when a firm is going to issue equity to raise capital. If a firm expects to finance externally soon and if a firm realizes that information asymmetry between the firm and investors is high, the firm would be inclined to divulge more information about the firm, such as the information about the progress of research and development, stage of merger negotiation, or preliminary quarterly earnings results, hoping to bring in higher

proceeds from equity offering. Therefore, the first hypothesis is that (in alternative form):

**H1: If a firm is going to finance externally while information asymmetry is high, the firm would increase its voluntary disclosure.**

Revealing information to reduce information asymmetry is not the only concern managers have in mind. One force that could affect managers' decision is to avoid litigation, or at least to reduce the severity of litigation. Involving litigation could ruin a firm's image, and/or cost the firm huge amount of money to settle.

If a firm expects its earnings or sales result is not going to be as good as expected, it could choose to be honest up front. Therefore, once actual bad news is released, investors will not be so surprised that they will tend to sue the firm for not warning in advance. Or even if they do sue the firm the damage would not be as severe as it would have been. On the other hand, the firm might be concerned that such preemptive disclosure would actually trigger litigation since it brings investors' full attention to the firm's incoming bad financial news. Thus, how the consideration of litigation costs would cause a firm to disclose about the bad news depends on how the firm weighs between the two forces mentioned above.

The concern about the incoming bad news and possible associated lawsuits could also influence a firm's decision about disclosing information that is *not* related to the incoming bad news. The firm could tend to restrain itself from revealing too much (other) favorable news so as not to cause inflating its stock price, which would be even more likely to trigger litigation once the bad news comes out later. It would also weaken investors' claim that the firm has used false favorable news to inflate its stock

price, even if the lawsuits do occur.<sup>3</sup> Given the ambiguity about the relation between litigation and disclosure, the second hypothesis is stated as (in alternative form):

**H2: Litigation costs affect a firm's voluntary disclosure decision.**

Competitors

In addition, a firm is aware of the relations with its competitors. However, how the relation with competitors would affect a firm's voluntary disclosure decision depends on how one interprets competition. On the one hand, access to unique technology or ability to produce a unique product could bring in market power to a firm. Such a market power would reflect in a firm's excess profits. To protect its abnormal profits, the firm would be cautious not to reveal the information that would cause damage to the firm's market power. Such information could include how the firm produces the product or the stage of development the firm is in for upgrading its technologies or products. Since having higher market power implies that the firm operates in a less competitive environment, less competition in the sense of market power could actually discourage disclosure.

On the other hand, a firm is also concerned about the threat of potential entrants. If barriers to entry are higher, potential entrants would be less likely to enter the market and the firm would feel less menaced by potential entrants.

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<sup>3</sup> For example, a class action filed on behalf of investors of Intel Corporation alleged that "as a result of Intel's extraordinary bullish statements and assurance during July, 2000-August 2000, on August 28, 2000, Intel's stock hit its all-time high of \$75-13/16. But the positive statements about the strong demand for Intel's products, Intel's improved manufacturing processes and efficiencies, the successful development and introduction of its Pentium II microprocessor, the successful development of the Pentium IV, Itanium and Timna chips and the outlook for Intel's 3<sup>rd</sup>Q 00 results, issued from July 18-19, 2000 through the Intel Developer Forum, were false." (Cauley Geller Bowman & Coates, LLP, 2001)

Barriers to entry could come from at least two sources: capital requirement and product differentiation advantages of established firms. If a potential entrant would need to invest a relatively huge amount of capital to enter the market and if most of the entry costs are sunk, it might choose not to enter. Even if it does enter, the established firm could easily gain cost advantage over the entrants by increasing the quantity of production to drive down the cost and thus price. Therefore, the entrant would be better off not to enter the market in the first place. Another source of barriers to entry could result from the established firms' product differentiation advantages. An existing firm could have had spent a great deal in advertising or research and development in order to distinguish its products from others. A potential entrant, in order to achieve the same level of product differentiation, would need to spend at least the same amount (or even larger amount since it has to induce the consumers to switch brand) as the existing firm. Such product differentiation advantages build a barrier to entry for a potential entrant<sup>4</sup>.

If an existing firm perceives a higher possibility for a potential entrant to enter due to lower barriers to entry, the firm would be more reluctant to disclose its private information, especially favorable information. Such information could aid in favor of the potential entrant and harm the firm. Since having lower barriers to entry implies that the firm faces higher competition pressure from potential entrants, more competition in the sense of barriers to entry could actually prevent disclosure.

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<sup>4</sup> Similar arguments about the relation between advertising expenditure and entry barriers could be found in Comanor and Wilson (1967) and Kessides (1986).

Since the relation between competition and disclosure depends on how one interprets competition, the third hypothesis is stated as the following (in alternative form):

**H3: Competition costs are associated with a firm's voluntary disclosure decision.**

Government

Another party that could influence a firm's decisions would be the government. The government and its regulatory agencies could affect wealth redistributions between a firm and other sectors of the economy, causing political costs to the firm (Watts and Zimmerman 1986, p.224; Whittred and Zimmer 1990, p.32). The redistribution of wealth could take the form of "the imposition of special taxes or the granting of various types of industry assistance such as price support schemes, tariffs, quotas, direct subsidies, bounties, licenses and so on." (Whittred and Zimmer 1990, p.33) A firm becomes politically visible (or politically sensitive or exposed) if it "attracts a disproportionate share of scrutiny by politicians, organized groups such as trade unions, and the general public, making it a potential target for the imposition of political costs." (Lim and McKinnon 1993, p.192) To counter possible government intrusions, a company would employ several strategies, such as "government lobbying and selection of accounting procedure to minimize reported earnings<sup>5</sup>." (Watts and Zimmerman 1978, p.115)

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<sup>5</sup> Previous works that emphasize on how the concern about political costs would cause a firm to minimize its reported earnings or manage its discretionary accruals include: Jones, 1991; Cahan, 1992; Key, 1997; Cahan et al., 1997.

Another strategy to deal with political scrutiny could be to manage the volume and the tone of a firm's voluntary disclosure<sup>6</sup>. Through controlling the release of corporate information that is not required to be disclosed, the firm could avoid attracting unnecessary attention from the government. Any information, such as impending merger plan or optimistic financial results, that would have a slight chance of causing sanctions from Security and Exchange Commission (SEC), investigations from Federal Trade Commission (FTC), or inspections from Internal Revenue Service (IRS), the firm would be cautious not to reveal it or at least to disclose it in a slower fashion. Therefore, the fourth hypothesis is stated as the following (in alternative form):

**H4: Political costs discourage a firm from more voluntary disclosure.**

#### Union

In addition, the force from a union could cause managers to alter their accounting choices (e.g., Liberty and Zimmerman, 1986; DeAngelo and DeAngelo, 1991)<sup>7</sup>. Such an influence from a union could reflect in a firm's choice about whether to withhold information as well. The presence of a union could form expectations about a firm's financial ability through the firm's disclosure. Since such expectations could affect the outcomes of the bargaining between the firm and the union (Roth and

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<sup>6</sup> Lim and McKinnon (1993) and Baker (1999) also hold similar views that political costs would be critical to a firm's disclosure decisions. However, Lim and McKinnon deal with the disclosure from public sector entities, while Baker claims that political costs could affect variations in options reporting across firms (p.129).

<sup>7</sup> Liberty and Zimmerman (1986) and DeAngelo and DeAngelo (1991) investigate the role a union could play on a firm's decision. However, the decision they emphasize is whether a firm would manage its earnings during labor union contract negotiations. Liberty and Zimmerman found no evidence of lower than expected earnings during negotiations, while DeAngelo and DeAngelo found reported income is lower during union negotiations, controlling for cash flows.



Schoumaker 1983, p.368), the firm would tend to avoid revealing news in order to lessen the expectations about the firm from the union. Besides, during the negotiation process, a firm could claim that it is unable to meet wage demand from a union due to its financial inability, such as an inability to stay competitive or a possibility of losing profit margin (Carrell and Heavrin 2001, p.184). Such a claim would not be credible if at the same time the firm announces favorable news to a great extent. News such as that incoming earnings result is better than expected, or that the new product launching would bring in competitive advantage for the firm, would cause doubt to the firm's claim about financial inability. Furthermore, Elias (1990, p.619) finds that the level of settlements between the firm and a union could be higher if they both have the same level of information about the firm. Therefore, a firm's reluctance to unveil the news might come from the concern that it would lead to higher amount of settlements. The fifth hypothesis is stated as (in alternative form):

**H5: Labor union costs discourage a firm from more voluntary disclosure.**

#### *Firm size*

In addition to weighing between the benefits and the costs of disclosing (or withholding) information, firms of different size could also exhibit different disclosure patterns due to the following reasons. First, differences in investors' interests towards firms of different sizes could cause a large firm more willing to provide more information about itself than a small firm. As elaborated in Atiase (1980, p.27), investors could be less interested in investing in the stocks of a small firm. In such a firm, the scale of operation is limited; therefore, so is the amount of potential investment. Besides, trading by informed traders would partially reveal

private information and thus limit the potential profits informed traders could gain from knowing a certain security has mispriced (Grossman and Stiglitz, 1976). Since the stock prices for a small firm could be easily affected (Atiase 1980, p.27) and it would be easy to spot the trading by informed traders of a small firm due to low trading volume (Freeman 1987, p.198), such a limitation would be even more severe for the informed traders of a small firm. Therefore, an investor would be less interested in the stocks of a small firm and would demand less information from it.

Second, large firms are usually involved in more business events and transactions. They commonly have broad bands of operations. They generally make many products and distribute over large geographic areas (Buzby 1975, p.18). Thus, large firms would tend to supply more information voluntarily because they have more events or transactions to report.

Finally, large firms could disclose more because they simply could not possibly effectively hide their news. Large firms are heavily followed by analysts. Bhushan (1989) indicates analysts following is positively related to firm size. In Gomes et al. (2004), it shows that average number of analyst forecasts for big firms (during the years 1997-2002) is around 10. On the contrary, for small firms, the average number of analyst forecasts is just 1. Besides, the news media are likely to carry news about large firms. For example, Wall Street Journal could have mentioned Intel Corporation (market value of equity of more than 200 billion<sup>8</sup>) in 181 news reports while it indicated Friendly Ice Cream Corporation (market value of equity of nearly 30 million) in only 3 news reports.

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<sup>8</sup> The figures of market value of equity are reported at value of year 2001. This is more corresponding to the test in Chapter 4 in this study.

Due to the reasons mentioned above, the hypothesis about the effect of firm size on disclosure is (in alternative form):

**H6: Firm size is positively associated with a firm's voluntary disclosure.**

Chapter summary

In summary, in this section I hypothesize that a firm would consider the forces from investors, competitors, government, and union when making a decision about voluntary disclosure. Specifically, I predict that a firm would increase its voluntary disclosure if it is going to issue equity to raise capital while it knows information asymmetry is high. I also predict that forces from the government and union would prevent a firm from more disclosure. I conjecture that litigation possibility from investors and competitive pressure from competitors would affect a firm's disclosure decision but the signs are unknown. In addition to the parties mentioned above, I also consider that firms of different size would exhibit different disclosure patterns. Specifically, I hypothesize that large firms would disclose more than small firms.

I have developed six hypotheses that consider both the benefits and the costs of disclosure in this section. In the next section, I would turn to the methodology used and the procedure of sample selection and data collection.

## Chapter 4: Methodology, Sample Selection and Data Collection

In this section, I first describe the model used to test the hypotheses and the definitions of variables. I then report the procedures of sample selection and data collection.

### Methodology

The model used to test the hypotheses is as follows<sup>9</sup>:

$$\begin{aligned} LDISC_{it} = & \alpha_0 + \alpha_1 INFASY_{it-1} + \alpha_2 EQUITY_{it+1} + \alpha_3 INFASY_{it-1} * EQUITY_{it+1} + \alpha_4 LITIGA_{it} \\ & + \alpha_5 COMPETE_{it} + \alpha_6 POLITIC_{it} + \alpha_7 UNION_{it} + \alpha_8 LSIZE_{it} + \varepsilon_{it} \end{aligned}$$

where

$LDISC_{it}$  = the logarithm of the number of information items firm  $i$  discloses in year  $t$ , which starts from the next day of the reporting date of annual earnings for year  $t-1$  to the reporting date of annual earnings for year  $t$ .

$INFASY_{it-1}$  = information asymmetry for firm  $i$  in year  $t-1$ , measured as annual average of the logarithm of the daily relative bid-ask spread, which is the absolute value of bid-ask spread scaled by the average of bid and ask.

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<sup>9</sup> The cost of including too many independent variables in the Ordinary Least Squares (OLS) regression is the reduced precision of the coefficient estimates (Greene, 2000, p.338). In other words, in the presence of the superfluous variables, the covariance matrix for the estimator would be larger. Given this, the least squares estimator in the OLS regression, however, is unbiased.

$EQUITY_{it+1}$  = whether firm i raises capital from issuing stock in year t+1, which is measured as the amount raising from issuing common or preferred stock (COMPUSTAT item #108) in year t+1, deflated by total assets (COMPUSTAT item #6) at the end of year t.

$LITIGA_{it}$  = which is measured by two variables ( $BLOCK_{it}$  and  $LOEPS_{it}$ ):

$BLOCK_{it}$  = the percentage of shares that are held by unaffiliated blockholders for firm i in year t.

$LOEPS_{it}$  = a dummy variable, which equals 1 if basic earnings per share (EPS) (COMPUSTAT item #58) in year t is less than basic EPS in year t-1, 0 otherwise.

$COMPETE_{it}$  = which is measured by the following variables:

$CONRTO_{it}$  = four-firm concentration ratio in year t, measured as the total sales of top-four firms scaled by the total sales of the industry (4-digit SIC code) that firm i operates.

$SPEED_{it}$  = the speed of adjustment for positive abnormal profits for the industry (4-digit SIC code) that firm i operates in year t, which is  $\beta_2$  derived from the following equation:

$$X_{it} = \beta_0 + \beta_1(D_n X_{it-1}) + \beta_2(D_p X_{it-1}) + \delta_{it}$$

where  $X_{it}$  equals firm i's returns on assets minus average returns on assets of the industry (4-digit SIC code) firm i operates.  $D_n$  equals 1 if  $X_{it-1}$  is less than or equal to zero, 0 otherwise.  $D_p$  equals 1 if  $X_{it-1}$  is greater than zero, 0 otherwise.

- $CAPINT_{it}$  = capital intensity for firm  $i$  in year  $t$ , which is measured as gross property, plant and equipment (COMPUSTAT item #7) scaled by total assets (COMPUSTAT item #6).
- $ADVRTO_{it}$  = advertising expense ratio for firm  $i$  in year  $t$ , which is measured as advertising expense (COMPUSTAT item #45) divided by total sales (COMPUSTAT item #12).
- $POLITIC_{it}$  = reported tax rate for firm  $i$  in year  $t$ , which is measured as total income taxes (COMPUSTAT item #16) divided by the absolute value of pretax income (COMPUSTAT item #170).
- $UNION_{it}$  = the percentage of employed workers who are union members in the industry (2, 3, or 4-digit SIC code) that firm  $i$  operates in year  $t$ .
- $LSIZE_{it}$  = firm  $i$ 's size in year  $t$ , which is measured as the logarithm of the multiple of common shares outstanding (COMPUSTAT item #25) and the stock price at the end of year  $t$  (COMPUSTAT item #199).

I use the number of information items a firm discloses within a year to measure the level of voluntary disclosure ( $LDISC$ ). I take the logarithm of the number of information items in order to mitigate scale problem. Following Kasznik and Lev (1995), Lang and Lundholm (2000), and Miller (2002), types of information items include earnings or sales forecasts, preliminary earnings or sales announcements,

operating activities announcements, financing activities announcements, and other miscellaneous announcements. A detail list of information items is shown in Table 2.

The information items in Table 2 only include those that a firm discloses voluntarily. Before obtaining the list shown in Table 2, I leave out certain items even though they are found in a firm's announcements through newswire. For example, I exclude the items that are mandatory, such as the announcements that are related to the acquisitions of other companies, shelf registration, and changes in by-laws, since such events are required to file to SEC. Furthermore, I exclude the items that are not mandatory but are declared by board of director. In other words, I take out announcements related to dividend declaration or dividend payment. In addition, I delete the announcements that may be related to independent variables used in the test. Therefore, I drop the announcements that are related to lawsuits and equity offering.

In Table 2, I further categorize disclosure items to those that are more proprietary in nature, versus those that are less proprietary in nature, since the parties such as competitors or the government would be mostly concerned about proprietary information. According to Dye (1985), proprietary information is "any information whose disclosure potentially alters a firm's future earnings gross of senior management's compensation" (p.123). It includes "information whose disclosure could generate regulatory action, create potential legal liabilities, reduce consumer demand for its products, induce labor unions or other suppliers to renegotiate contracts, or cause revisions in the firm's credit standing in addition to that information which is, in traditional sense, strategically valuable" (p.123). Therefore,

I classify information items within categories A (earnings or sales forecast) and B (preliminary earnings or sales announcement) as proprietary information and those within categories D (financing activities announcement) and E (other miscellaneous announcements) as nonproprietary information.

Information items within category C are classified as either proprietary or nonproprietary depending on the nature of information items. Based on the concept proposed by Dye (1985), the following information items are categorized as proprietary: announcements of order backlogs, announcements of joint ventures, announcements of write-off of assets or sales of assets, announcements of capital expenditure, announcements of major contracts such as purchase contract or license agreement, announcements of research and development plan and progress, announcements of restructuring such as labor layoff or work hour or pay cutting, announcements of new product, product application or product achievement. Information items, such as announcements of building a new department or moving headquarter to a new location, announcements of giving award to suppliers, or announcements of using product suggestion, are set as nonproprietary. Examples of information items listed in category C are given in appendix A.

Following Mohd (2005), I use annual average relative bid-ask spread to proxy for information asymmetry (*INFASY*) between the firm and the investors. In Callahan et al. (1997), they state that bid-ask spread, especially the adverse selection component, “reflects the degree of information asymmetry risk perceived by the dealer” (p.51). The dealer sets the bid-ask spread so that the expected gains from uninformed traders cover the expected losses to informed traders. The spread would be larger if the



dealer perceives a greater possibility of trading with informed traders. Using bid-ask spread to proxy for information asymmetry between the firm and the investors, I assume informed traders possess almost as much information as the firm.

Following Clarkson et al. (1994), I measure a firm's equity incentive (*EQUITY*) by looking at the amount a firm raises from issuing common stock or preferred stock in the next year. I also add an interaction term (*INFASY\*EQUITY*). If the influence of incoming equity offering causes a firm to disclose more while the firm realizes information asymmetry between the firm and the investors is high, I expect interaction term to be positively correlated with *LDISC*.

I use two variables, *BLOCK* and *LOEPS*, to measure a firm's litigation costs, following Bamber and Cheon (1998, p.177). Shleifer and Vishny (1986) argue that blockholders, which are parties who already own a large amount of shares of the firm, could "bring about value-increasing changes in corporate policy" (p.462). Their argument is that such blockholders are more willing to pay for the costs of watching the management. Romamo (1991) then finds that a firm with a higher percentage of outside blockholders is more likely to be involved in a lawsuit. Therefore, I use *BLOCK*, which is the percentage of shares that are owned by blockholders that are not affiliated with management, to estimate litigation costs.

I also use *LOEPS* to proxy for litigation costs. *LOEPS* is a dummy variable that equals one if a firm's current year's basic EPS is less than previous year's basic EPS, and zero otherwise. If a firm experiences lower EPS in current year, it is more likely to trigger a lawsuit by investors for inflating earnings in previous year.

I use multiple measures about competition costs to account for various interpretations of competition<sup>10</sup>. *CONRTO*, which is the ratio of top-four firms' sales to industrial sales, and *SPEED*, which measures the speed of adjustment for positive abnormal profits, are more in line with measuring whether the firms are within the industry that enjoys excess profits. Put differently, these two measures approximate market power at industry level. Another two measures of competition, *CAPINT* and *ADVRTO*, are more corresponding to the concept of barriers to entry. *CAPINT*, which is the ratio of gross property, plant and equipment to total assets, and *ADVRTO*, which is the ratio of advertising expense to total sales, reflect sunk costs that a firm has invested in. These two types of expenditure comprise a firm's cost advantages in the face of threat from possible entrants.

I use a firm's reported tax rate (*POLITIC*) to estimate political costs. A firm's reported tax rate is measured as the ratio of total income taxes to the absolute value of pretax income. By taking the absolute value of pretax income, I implicitly assume that no matter firms have positive or negative pretax income, firms with the same amount of income taxes expense or income taxes benefit would have similar political sensitivity.

Measuring reported tax rate in the definition above is a common way a firm would calculate its tax rate and report in the 10-K reports. For example, in the 10-K report for year 2001, Applied Digital Solutions Inc had pretax loss of \$177,606 and provision for income taxes of \$20,870. It reported that it had effective tax rate of

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<sup>10</sup> Here I didn't measure competition effect by using the Lerner Index, which is also one of the proxies used in previous studies to measure competition costs. The reason is that in a preliminary test, the Lerner Index is found to be highly correlated with *EQUITY* (Pearson correlation coefficient = -0.764)

11.8%. In the 10-K report for year 2000, with pretax loss of \$33,985 and benefits for income taxes of \$5,040, it indicated that its effective tax (benefit) rate is (14.8)%.

Wong (1988) also uses similar definition to quantify political costs. As claimed in Wong (1988, p.40), a firm (especially a very large and profitable firm) that pays little or no tax is susceptible to criticisms. Therefore, I expect a firm with low reported tax rate is more political vulnerable. If a firm with high political sensitivity would be inclined to prevent disclosure, this leads to a prediction of a positive association between *POLITIC* and *LDISC*.

Here rather than using firm size, which is a common proxy for political costs in previous studies, I use reported tax rate to proxy for the political costs a firm bears. The reason behind this is that Ball and Foster (1982) question the construct validity of firm size to operationalize the concept of political costs. They argue that firm size is associated with numerous other factors, such as industry membership (1982, p.183). In addition, Zimmerman (1983) finds that the relation between firm size and tax rates varies among different industries. Viewing corporate tax as a component of political costs, such a result implies that at least in some industries, firm size might not be able to serve as a good proxy for political costs.

However, as elaborated in the previous chapter, since the imposition of taxes is only one form of political costs, caution still must be exercised when using such a proxy. By using reported tax rate as a proxy for political costs, I implicitly assume other non-tax components of political costs are negligible.

I use the percentage of workers who are union members to estimate the costs arising from labor relation (*UNION*). If a firm operates in an industry in which most

of the workers are union members, during contract negotiation, the union would have more bargaining power since it has broader supports from employees. Since costs related to labor relation are increasing in the percentage of union-member workers, I expect *UNION* to be negatively associated with *LDISC*.

I also include firm size (*LSIZE*), which is measured as the logarithm of end-of-year market value of equity, to estimate the effect of firm size. If the bigger the firm the greater the incentive to reveal the information, I expect *LSIZE* to be positively related to *LDISC*.

### Sample selection

I choose all firms, except firms within the industries with SIC codes 4000-4999 and SIC codes 6000-6999, as my initial sample firms. Industries with SIC codes 4000-4999 include transportation, communications, electric, gas and sanitary services industries. Industries with SIC codes 6000-6999 are industries of finance, insurance, and real estate. I leave out these industries due to their special once-regulatory nature. The firms within such industries could be under different (or stricter) regulatory pressure so that they might express different disclosure behaviors. The initial number of sample firms is 5325.

To obtain data about concentration ratio and speed of adjustment for abnormal profits, I require firms included must operate in an industry (4-digit SIC code) in which the number of firms is greater than or equal to 30. This restricts the number of sample firms to 2323. I further require firms included must have fiscal-year end in December to ease data collection. The number of firms is reduced by 497. After

requiring the availability of all related data, including all financial data, blockholder information, bid-ask spread data, and disclosure data, the number of firms is down to 162. I further delete 5 firms that either experience merger of equal, or file for bankruptcy, or change stock exchange, or being delisted from stock exchange, since such firms might exhibit different disclosure pattern than normal times. The final number of firms used is 157 (Table 3).

Table 4 gives a list of sample firms. According to Francis and Schipper's (1999, p.343)<sup>11</sup> definition of high-technology industries, 102 (65%) firms are from high-technology industries. Based on the definition of industries that could have a high incidence of litigation, given by Francis et al. (1994, p.144)<sup>12</sup>, 125 (80%) firms operate in industries that could have a higher incidence of being sued. As shown in Table 5, the size of sample firms varies to a great extent. Market value of sample firms ranges from 5 million to 250 billion.

### Data collection

I collect disclosure data from Factiva<sup>13</sup> database. The sources of publications that I focus on include *Barron's*, *Wall Street Journal*, *Dow Jones News Service*, *Business Wire*, *PR Newswire*, *Associated Press Newswires*, *Dow Jones Business News*, *Reuters News*, *Reuters Significant Development*, and *Major News and Business Publications*

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<sup>11</sup> Francis and Schipper (1999) list the following industries (3-digit SIC code) as high-technology industries: 283, 357, 360, 361, 362, 363, 364, 365, 366, 367, 368, 481, 737, and 873.

<sup>12</sup> Francis et al. (1994) categorize the following industries as having a high incidence of litigation (p.144): biotechnology (SIC codes 2833-2836 and 8731-8734), computers (SIC codes 3570-3577 and 7370-7374), electronics (SIC codes 3600-3674), and retailing (SIC codes 5200-5961).

<sup>13</sup> Factiva was a joint venture between Dow Jones & Company and Reuters Group, founded on May 17, 1999. It was a combination of both firms' interactive business services, Dow Jones Interactive (formerly known as Dow Jones News/ Retrieval) and Reuters Business Briefing. It was acquired by Dow Jones in December 2006 and is now fully owned by Dow Jones & Company.

of the U.S. region (which includes many local newspapers). I search all sources using a firm's name and its ticker as key words. Since the sources of publication I rely on are very inclusive, many disclosure reports appear more than once. I keep the reports that are the most extensive. Additionally, I include the reports that are initiated by the firm, and keep articles written or initiated by someone other than the management only if the articles include information that is released by management (such as an interview of CEO by news reporter or a press release initiated by the firm's supplier in which the firm makes comments). I read each retained disclosure reports and record the number of information items within each report.

To more closely focus on a firm's decision about disclosure or not, I also restrict to the reports that could be clearly identified as initiated by a firm. In other words, I only keep those reports that have wordings such as "XXX Company announces..." "XXX Company says..." or "XXX Company introduces..." etc. I discard the reports that are quoted from management or if I have doubt about whether they are initiated by management.

I gather all financial data from CRSP/ COMPUSTAT Merged Database. Through NYSE Trade and Quote Database (TAQ), I collect data of bid-ask spread. Firms with different ticker in these two databases are matched.

To obtain information about the percentage of unaffiliated blockholders for a firm, I use a database developed by Dlugosz et al. (2004). The dataset contains data for 1913 firms for the period 1996-2001. It was cleaned for biases and mistakes that usually are found in the standard source of this type of data. For the firm whose data

about the percentage of unaffiliated blockholder is not available from Dlugosz et al.'s dataset, I then hand collect from the firm's proxy statement.

The data about unionization rate is generated from a database constructed by Barry Hirsch and David Macpherson. This database, which is updated annually, provides private and public sector labor union membership, coverage, and density estimates compiled from the Current Population Survey (CPS). The data within the database is given by industry, according to either 2-digit, or 3-digit, or 4-digit SIC code.

I choose one year (year 2001) and perform Ordinary Least Squares (OLS) regression analysis cross-sectionally. Previous studies argue that firms' disclosure policies tend to be "sticky" (e.g., Botosan 1997, p.327; Field et al. 2005, p.495). In other words, firms' disclosure policies could be relatively unchanged over time. For example, a firm would consistently make earnings forecasts over years unless uncertainties about the future prevent the firm from making reasonable forecasts. Therefore, I choose to increase sample size by collecting cross-sectional observations as opposed to observations over time. I choose year 2001 because it is the most recent year that I could obtain data about unaffiliated blockholders from Dlugosz et al.'s database.<sup>14</sup>

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<sup>14</sup> However, due to the different nature of disclosure variable investigated in this study, I also collect data of a randomly-selected mini sample for another year (year 2002) to see whether any changes in disclosure behaviors occur over time. I provide the details as the additional tests in Chapter 5.

### Chapter summary

In this section I set up a model to test the hypothesis. I measure disclosure variable in two manners: the number of information items disclosed within a year and the number of *proprietary* information items disclosed within a year. I chose one year (year 2001) and collect cross-sectional observations rather than time-series observations to enhance the variability in disclosure variable. The final sample size is 157 firm observations, within 25 industries (4-digit SIC code). In the next section I turn to present the results from univariate analysis, Pearson correlation analysis, and OLS regression analysis.



## Chapter 5: Results

In this section, I first present and analyze the variables' descriptive statistics. I then report the Pearson correlation coefficients among variables. At last I show the results from OLS regression analysis for the main test and additional tests.

### Descriptive statistics

Table 5 provides descriptive statistics of disclosure variables. The total number of information items that a firm discloses within a year ranges from 1 information item to 370 information items. On average a firm discloses 34 information items within a year. Decomposing into industry level, Table 6 (Panel A) shows that firms in the Semiconductors and Related Devices industry (SIC code 3674) have the highest number of information items (116 information items), followed by firms in the Prepackaged Software Service industry (SIC code 7372) (55 information items) and firms in the Computer Integrated Systems Design Services industry (SIC code 7373) (37 information items). All these three industries are viewed as high-technology industries (Francis and Schipper 1999, p.343) and as industries that have high incidence of litigation (Francis et al. 1994, p.144).

Restricting information items to those that are more proprietary in nature, the average number of proprietary information items a firm discloses within a year is 29 (Table 5). In other words, among the information items a firm voluntarily discloses within a year, on average 85% (29/34) are proprietary information.

Focusing on the information items that could be clearly identified as initiated from management, a firm on average discloses 30 information items within a year (Table 5). Looking more closely at industry level, Table 6 (panel C) shows that the average information items firms discloses in the Semiconductor and Related Device industry (SIC code 3674) is down from 116 to 68. In other words, in the Semiconductor and Related Device industry, on average 41% (48/116) of information items are not initiated by management. On the contrary, the average information items in other industries do not vary much once I restrict the information items to those that are initiated by management.

Table 5 also provides simple statistics of other variables. The percentage of shares held by 5% owners, who are not related to management, is 16% on average. A firm could have as much as 58% of its shares held by multiple outside blockholders or have no outside blockholders at all. Furthermore, four-firm concentration ratio is with mean value of 57%. It varies from 38% (the Business Services industry) to 86% (the Computer Peripheral Equipment industry). This indicates that most of the sample industries used in the test are concentrated. In addition, most of the sample firms do not spend much on their advertising expenses. 95% (not tabulated) of the sample firms spend less than 15% of their total sales on advertising expenses. Moreover, union membership of sample industries ranges from 1.4% to 36.7%. In the Motor Vehicle Parts & Accessories industry (SIC code 3714), 36.7% of workers are union member, while in the Computer and Data Processing Services industry (SIC codes 7370-7377) only 1.4% of workers join union.

### Pearson correlation coefficients

Table 7 gives Pearson correlation coefficients among variables. Information asymmetry in the previous year (*INFASY*) is significantly and negatively correlated with disclosure (*LDISC*). This could indicate an equilibrium relation between information asymmetry and disclosure. If information asymmetry between a firm and investors in the last year is high, compared to other firms, such a relatively higher relation is likely to continue into the current year. Therefore, one is likely to observe a negative relation between information asymmetry (in the previous year) and disclosure (in the current year).

Table 7 also shows that capital intensity (*CAPINT*) is significantly correlated with disclosure (*LDISC*). They are negatively related. Although Hypothesis 3 does not give predictions about how competition would affect disclosure, if the amount a firm invests in gross property, plant and equipment represents sunk costs that cause barriers to entry for potential entrants, a firm with higher capital intensity should enjoy higher barriers to entry. As elaborated in the development of Hypothesis 3, a firm with higher barriers to entry (and thus less competition from potential entrants) should be more confident about disclose more. In this sense, the result shown here is not consistent with the conjecture.

The results in Table 7 also show that political costs proxy (*POLITIC*) is significantly and positively associated with a firm's willingness to disclose information ( $p\text{-value} = 0.05$ ), which implies that a firm under higher political scrutiny tend to restrict its disclosure. Such a relation exists whether the firm is to disclose proprietary or nonproprietary information. Furthermore, union membership (*UNION*)

shows a significant and negative relation to a firm's disclosure decision. Specifically, the relation is more distinct when it comes to disclosing proprietary information ( $p$ -value = 0.026). In addition, firm size ( $LSIZE$ ) is found to be significantly and positively correlated with disclosure ( $LDISC$ ) ( $p$ -value = 0.001). Larger firms seem to disclose a lot more. Although these relations are consistent with the hypothesis, the results are preliminary since these only represent simple correlations. A multivariate analysis would be necessary to draw definite conclusions after controlling for the effects of other variables that might affect a disclosure decision at the same time.

The results in Table 7 also raise the concern about multicollinearity problem. The variables  $EQUITY$  and  $ADVRTO$  have a correlation of 0.51, while  $LSIZE$  has a correlation of -0.78 with  $INFASY$ . Since multicollinearity problem would work against finding significant results<sup>15</sup>, the results in multivariate OLS regression analysis shown below are stronger than they appear.

#### Ordinary Least Squares (OLS) regression: main test

Table 8 provides the results from multivariate OLS regression analysis. In Table 8 (Panel A), it shows that, other things being equal, large firms are likely to reveal more information (t-values are from 2.99 to 3.29, significant at 5% level in one-tailed tests). Such a result is consistent with the hypothesis and the findings in previous studies (e.g., Lang and Lundholm, 1993). Large firms have incentive to disclose

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<sup>15</sup> With partial multicollinearity problem, type I error, which is the probability of rejecting null hypothesis while null hypothesis is true, is not affected. Type II error is, however, affected. If independent variables are highly correlated, null hypothesis will tend to be accepted with high probability.

more. The demand for information about a large firm from investors is higher than that about a small firm. Investors could gain more from trading a large firm's stock. In addition, a large firm also supplies more information because it has a broader band of operations. It simply has a great deal of information to disclose. Finally, the fact that a large firm discloses more about itself could be simply because it is too hard for the firm to hide the news. The news media is watching closely at the large firm, and so are the analysts. Therefore, a large firm has every reason to unveil more.

In addition to the effects of firm size, the results in Table 8 (Panel A) also show that information asymmetry between the firm and investors is significantly and negatively associated with disclosure, when the amount the firm raises from issuing stock in the next year equals zero (t-values are from -3.01 to -2.34, significant at 5% level in one-tailed tests). This indicates that if the firm does not expect incoming equity issuance, other things being equal, relatively higher information asymmetry (in the previous year) is likely to continue into the current year. Therefore, in equilibrium, a negative relation between information asymmetry (in the previous year) and disclosure (in the current year) is likely to be observed.

Table 8 (Panel A) also provides evidence that a firm could be concerned about the possibility of being involved in lawsuits. Such a concern is more obvious when a firm has a larger percentage of shares held by stockholders who are not affiliated with the firm (t-values are from -2.79 to -2.33, significant at 5% level in two-tailed tests). Other things being equal, I find that litigation pressure coming from having a lot of outside blockholders could deter a firm from being a frequent discloser. The information restrained could be an earnings forecast, or a product announcement, an

update about R&D progress, or simply an announcement about how to use company's products.

Using reported tax rate as a proxy for political costs, I find that the concern about possible political costs could play a role in a firm's decision to disclose information. Specifically, I find that political costs proxy (*POLITIC*) is positively related to disclosure (*LDISC*) (t-values are from 1.65 to 1.73, significant at 5% level in one-tailed tests), other things being equal. This represents that firms with higher reported income tax expenses have tendency to reveal more simply because such firms think they are under less political scrutiny. In other words, those firms who pay less income tax expenses or even obtain income tax benefits keep quiet about themselves because they expect higher attention from the government.

Table 8 (Panel A) also indicates that a firm could take into account of the bargaining power from a union when it makes a disclosure decision. Specifically, I find union membership proxy (*UNION*) is significantly and negatively associated with disclosure (*LDISC*) (t-values are from -2.07 to -1.69, significant at 5% level in one-tailed tests), other things being equal. Such a result is consistent with the finding from Scott (1994). However, since Scott did not consider the effects of litigation, competition and government, the result shown here points out that such a relation exists even after controlling for other factors. In addition, the type of disclosure considered here is more generalized than that in Scott (1994).

I find weak evidence that competitors would play a role in a firm's disclosure decision, other things being equal. Among four proxies for competition, only the speed of adjustments for abnormal profits (*SPEED*) shows a significant (at 5% level

based on a two-tailed test) influence on disclosure. In other words, after taking into account of other variables that might affect a firm's disclosure decision, I find support for the argument that less competition (in the sense of more market power) would lead a firm to reveal less to protect its excess profits. On the other hand, viewing capital investment and advertising expenditure as two types of sunk costs that could cause entry barriers for potential entrants, both variables (*CAPINT* and *ADVTRTO*) do not show significant associations with disclosure (*LDISC*). Therefore, I fail to find clear evidence about the argument that more competition (in the sense of lower barriers to entry) would prevent a firm from more disclosure.

In Table 8 (Panel A), the interaction term (*INFASY\*EQUITY*) is not significant. Therefore, I fail to find evidence supporting the statement that a firm would increase its disclosure in the face of equity offering while experiencing high information asymmetry. Such a result is more aligned with Frankel et al.'s (1995) results while inconsistent with Lang and Lundholm's (1993 and 2000) findings.

After restricting the attention to those information items that are more proprietary in nature, Table 8 (Panel B) presents results that are similar to Table 8 (Panel A). However, the concern about potential political costs seems not to have a clearly significant influence about disclosing proprietary information. A firm could be concerned more generally, i.e., whether the information is proprietary or not, when it faces possible scrutiny from the government and other regulatory agencies. On the other hand, Table 8 (Panel B) shows that the influence from outside blockholders is even more salient towards the decision about divulging proprietary information. The

influence from the bargaining power from a union also plays a more distinct role in the decision about disclosing proprietary news.

Ordinary Least Squares (OLS) regression: additional tests

To measure more precisely about a firm's disclosure-or-not decision, I also restrict announcements to those that I can clearly identify as being initiated by management. Table 9 reports the results of multivariate OLS regression analysis. In Table 9, the results are mostly qualitatively similar to those in Table 8. Political costs proxy (*POLITIC*), however, shows a significant relation to disclosure (*LDISC*), no matter it is to disclose proprietary information or not (t-values are from 1.65 to 1.85, significant at 5% level in one-tailed tests).

Furthermore, whether a firm's disclosure policy is as "sticky" as claimed in previous studies raises an issue. Whether what would influence a firm's disclosure decision will change across time raises another issue. To investigate these, from 157 firm observations used in the tests, I rank them according to their permanent numbers and select two out of every five firm observations. I choose year 2002 as another investigation year. The resulting sample size is 60 firm observations, within 18 industries (4-digit SIC code).

The first issue is to see whether the number of (proprietary) information items disclosed within a year changes significantly from year 2001 to year 2002. The results (not tabulated) do not find evidence that the number of information items could be significantly different within these two years (t-value = 0.76,  $\Pr > |t| = 0.4520$ ). However, once I restrict the attention to those information items that are



more proprietary in nature, I *do* find some evidence that the number of information items is different from year 2001 to year 2002 (t-value = 2.04, significant at 5% in a two-tailed test). Therefore, a firm's disclosure behaviors in general could be "sticky"; it might not change from time to time. In terms of disclosing proprietary information, i.e. an overall decision about whether to issue an earnings or sales forecast, whether to preliminarily announce earnings or sales results, whether to announce an achievement in a newly launched product, whether to update progress in R&D, whether to mention a newly signed cooperation contract, etc, a firm's decision is more likely to change from time to time because of the strategic concern.

The second issue I examine is to see whether what would influence a firm's disclosure decision changes from year 2001 to year 2002. I report the results of an OLS regression analysis for year 2002 in Table 10. I report only the results that consider the announcements that are both initiated by management and quoted from management. The results remain qualitatively similar even if I focus only on the announcements that are initiated by management.

The results in Table 10 (both Panels A and B) still share some similarities to those of year 2001. The forces from bargaining power of a union remain to prevent a firm from more disclosure. A larger firm still prefers to reveal more. A firm with more market power still tends to say less in order to protect its competitive advantages. In Table 10, however, it shows that litigation pressure from big outside blockholders seems to play less a role in year 2002.

The most major difference from the results of year 2001 to those of year 2002 is that, political costs proxy (*POLITIC*) is now *negatively* associated with disclosure,

particularly significantly *negatively* related to disclosing proprietary information (t-values are from -1.54 to -1.76, three of them are significant at 5% level in one-tailed tests). This shows that in year 2002 a firm with higher political sensitivity would be more likely to discuss *more* information, especially proprietary information. One possible explanation is that due to the filing for bankruptcy of Enron in late 2001 the government and other regulatory agencies are paying more attention to the disclosure environment of corporate firms than before. Companies, in the face of increasing government scrutiny, would exhibit different disclosure behaviors by providing more information voluntarily.

#### Chapter summary

In this section I show evidence that litigation pressure, political scrutiny and bargaining power from a union could cause a firm to restrain its disclosure of information, especially proprietary information. In addition, owning higher power could lead a firm to say less to protect its unique competitive advantage, while a large firm would prefer to reveal more about themselves. Furthermore, I show that the disclosure of proprietary information could be not as “sticky” as mentioned in previous studies. Finally, I find evidence that indicate a possible different disclosure pattern due to changes in political environment from year 2001 to year 2002.

## Chapter 6: Conclusion

In this section I first discuss my conclusions. I then describe the limitations and future directions of the study.

### Conclusion and discussion

A firm could have multiple audiences in mind when it is to disclose its private information. The results in this study indicate that the bargaining power from a union could play a significant role in a firm's decision process of disclosing information. Litigation possibilities from having big outside shareholders could also be of certain concerns. Such influences are even more obvious when it comes to revealing proprietary information. The directions of influences are negative; they would discourage a firm from unveiling more.

The mixed findings found in previous studies about the relation between competition and disclosure are also reconciled to some degree. In this study I argue that the conflicting results are due to different interpretations about competition from different researchers. However, I only find evidence that are more aligned with the statement that less competition (in the sense of more market power) would lead to less disclosure. I do not find evidence supporting the argument that more competition (in the sense of lower barriers to entry) would actually cause less disclosure.

A large firm is found to be more likely to say more. In this study I argue that the incentives for a large firm to disclose more could come from both the demand and the supply sides. Investors demand more information about a large firm because they

like to own the stocks of a large firm and need more information from it. A large firm supplies more information because it has a broader range of operations and because there is no way it could effectively hide any news.

The forces from the government also come to a firm's mind when making a disclosure decision. In the period with less political pressure, firms hide more about themselves to avoid further political attention. However, once the overall political environment has changed, firms tend to provide more information, particularly proprietary information, to fulfill increasing disclosure demands from the government.

### Limitations

The results in this study, however, are limited in two ways. First, the number of information items a firm could disclose within a year, which is the disclosure variable used in the study, tends to be mechanically increasing in firm size. This is because normally a larger firm would have more events or transactions occurring within a year. However, using such a disclosure variable enables researchers to consider a firm's disclosure decision more completely and generally.

Second, corporate income tax only represents one part of political costs a firm bears. In case political costs other than corporate tax are not negligible, the results about political costs hypothesis should be interpreted in caution.

### *Future directions*

In future study, alternative proxies for a firm's concerns about its investors could be used to test the model. Examples would include using stock prices volatility as a proxy for information asymmetry between a firm and investors. In addition, although developing proxies for a firm's consideration about its political costs is difficult, such an expansion could pour more insights into the study.

## Appendix A

Examples of information items listed in category C

C1: Write-offs or sales of assets

“XXX Company announced that its Board of Directors has authorized the company to spin off its YYY subsidiary....”

“XXX Company sold its San Diego, California-based fully equipped and staff gene therapy manufacturing facility to YYY Company for 4.8 million....”

“XXX Company announces that it will post a one-time non-cash write off of approximately \$9 million associated with its investment in YYY Company....”

C2: Order backlogs

“XXX Company today announced it has received a multi-system order for its electrofill system from YYY Company....”

“XXX Company announced today that its OEM sales division has received purchase orders from a Fortune 500 company to manufacture a new product line of high end audio/video cables. The order size is approximately \$1.1 million and deliveries are currently scheduled for the end of the second quarter and beginning of the third quarter of 2002.”

C3: Announcement of capital expenditure

“XXX Company announced today it has broken ground for a new \$45 million semiconductor testing facility and design center in YYY....”

C4: Announcement of new products, product applications or product achievements

“XXX Company today announced the introduction of the first over-the-counter line of dye-free, liquid pain relievers and fever reducers for children....”

“XXX Company today announced the worldwide availability of the Zip(R) 250 MB MultiBay Drive from YYY Computer Corporation....”

“XXX Company today announced that it has reached a new milestone in silver sales with the shipment of the 300<sup>th</sup> S80 server, making the ultra-powerful UNIX system the fastest-selling high-end server in history....”

C5: Announcement of joint ventures

“XXX Company and YYY Company today announced the companies have formed ZZZ Company, a joint venture that will focus on the development and commercialization of new equipment and materials for rapid tooling and direct and indirect in-line manufacturing processes....”

C6: Announcement of research and development progress

“XXX Company announced today that the company will conduct clinical studies to assess the safety and efficacy of YYY in children aged 10 and over with type 2 diabetes....”

C7: Major contracts: purchase contract, license agreement or cooperative agreement

“XXX Company and YYY Company announced today a three-year agreement for YYY Company to license XXX’s Integrated Outcomes Database....”

“XXX Company and YYY Company today announced a strategic technology partnership that will result in the development of technology aimed at the high-speed communications market.....”

C8: Restructuring: labor cutting or work hour/pay cutting

“XXX Company announced that it will cut about 20% of its workforce, discontinue or reallocate nonessential projects and cut discretionary expenses due to the economic slowdown and decline in capital spending....”

C9: New department, new location or other operations changes

“XXX Company today announced that it is consolidating the company’s two prescription pharmaceutical units into a single, unified Global Prescription Business Unit....”

C10: Giving award

“XXX Company today announced the eight winners of its prestigious Supplier Continuous Quality Improvement (SCQI) award for 2000....”

C11: Using product suggestion, product-related event or other suggestions

“XXX Company urges smokers this World No Tobacco Day to make a commitment to quit smoking or encourage family members or friends who smoke to extinguish their cigarettes permanently....”



Table 1: Summary of literature related to the relation between competition and disclosure

Studies	Disclosure issue focused	Proxies used to measure competition effect	Control for financial valuation factor	The relation between competition and disclosure found	Consistent with Verrecchia (1983) or Darrrough and Stoughton (1990)?
Clarkson, Kao and Richardson (1994)	Whether to include forecasts in the MD&A section of annual reports	Ratio of property, plant and equipment to total assets	Yes	More competition → less disclosure (for good news firms)	Verrecchia (1983)
Harris (1998)	Report operations as a business segment	The four-firm concentration ratio and a measure of the speed of profit adjustment	No	Less competition → less disclosure	Darrrough and Stoughton (1990)
Gleason (1998)	Report segment data voluntarily	The Lerner Index	Yes	Less competition → less disclosure	Darrrough and Stoughton (1990)
Piotroski (1999)	The fitness of reported segment information	Return on equity, firm size and a measure of industry performance diversification	Yes	More competition → less disclosure	Verrecchia (1983)
Botosan and Harris (2000)	Report quarterly segment data for the first time	The four-firm concentration ratio	Yes	Less competition → less disclosure	Darrrough and Stoughton (1990)

Table 2: Information item categories

	Information items	Proprietary (P) or Nonproprietary (N) <sup>a,b</sup>
<b>A. Forecast</b>		
1.	Point, range and qualitative estimate of quarterly sales	P
2.	Point, range and qualitative estimate of quarterly earnings	P
3.	Point, range and qualitative estimate of annual sales	P
4.	Point, range and qualitative estimate of annual earnings	P
<b>B. Preliminary earnings/sales announcement</b>		
1.	Preliminary earnings announcement, quarterly	P
2.	Preliminary earnings announcement, annual	P
3.	Preliminary sales announcement, quarterly	P
4.	Preliminary sales announcement, annual	P
<b>C. Operating</b>		
1.	Write-offs or sales of assets	P
2.	Order backlogs	P
3.	Announcement of capital expenditure	P
4.	Announcement of new product/service, product application or product achievement	P
5.	Announcement of joint ventures	P
6.	Announcement of research and development progress	P
7.	Major contracts: purchase/supply contract, license agreement or cooperative agreement	P
8.	Restructuring: labor cutting or work hour/pay cutting	P
9.	New apartment, new location or other operations changes	N
10.	Giving award	N
11.	Using product suggestion, product-related event or other suggestions	N
12.	Other miscellaneous operating-related information	N
<b>D. Financing</b>		
1.	Equity buyback	N
2.	Debt: financing	N
3.	other debt-based transactions	N
<b>E. Miscellaneous</b>		
1.	personnel changes---employee (fire, hire, promote)	N
2.	personnel changes---board (appoint or resign)	N
3.	community services, charitable contribution, awards	N
4.	vague discussion of company/history	N

a. The list of information items categories is modified from Miller (2002)

b. I distinguish a proprietary information item from a nonproprietary information item based on the concept proposed by Dye (1985). He states, "proprietary information is the information whose disclosure could generate regulatory action, create potential legal liabilities, reduce consumer demand for its products, induce labor unions or other suppliers to renegotiate contracts, or cause revisions in the firm's credit standing in addition to that information which is, in traditional sense, strategically valuable" (p.123).

Table 3: Sample selection procedure

Selection Criteria	Number of Firms
Firms in the industries with SIC code 100-3999, 5000-5999, and 7000-9999	5325
Less:	
Within industry (4-digit SIC code) whose number of firms $\geq 30$	(3002)
Fiscal-year end in December	(497)
All financial data available	(1387)
Earnings report date for years t-1 and t-2 available	(171)
Union membership data available	(2)
Blockholder data available in proxy statement	(28)
Bid-ask spread data available	(39)
Disclosure data available	(37)
Not experience a merger of equal	(1)
Not file for bankruptcy	(1)
Not change stock exchange	(1)
Not delist from stock exchange	(2)
Total	157

Table 4: Sample firms

SIC code	Industry Name	No of Firms	Company Name
1311	Crude Petroleum & Natural Gas	1	Navidec Inc
2834	Pharmaceutical Preparations	17	Pharmacia Corp Bristol-Myers Squibb Co Pfizer Inc Johnson & Johnson Chiron Corp Bausch & Lomb Inc MGI Pharma Inc Natures Sunshine Products Inc Vertex Pharmaceuticals Inc Bradley Pharmaceuticals Inc United-Guardian Inc Reliv International Inc Virbac Corp Quigley Corp King Pharmaceuticals Inc Mannatech Inc Genentech Inc
2836	Biological Products (No Diagnostic Substance)	2	Nabi Biopharmaceuticals Gilead Sciences Inc
3559	Special Industry Machinery	3	Novellus Systems Inc 3D Systems Corp Veeco Instruments Inc
3576	Computer Communications Equipment	4	Focus Enhancements Inc Performance Technologies Inc AESP Inc Foundry Networks Inc
3577	Computer Peripheral Equipment	4	Isomet Corp Stratasys Inc Lexmark International Inc Immersion Corp
3661	Telephone & Telegraph Apparatus	4	Inter-Tel Inc Polycom Inc Terayon Communication Systems Inc Tut Systems Inc
3663	Radio & TV Broadcasting & Communications Equipment	5	Tekelec Merrimac Industries Inc Digital Recorders Inc Spectralink Corp Sonicwall Inc

Table 4 (Continued)

3674	Semiconductors & Related Devices	6	Texas Instruments Inc Intel Corp Advanced Micro Devices Actel Corp Plx Technology Inc Smartdisk Corp
3679	Electronic Components	3	Technitrol Inc Vicor Corp Nortech Systems Inc
3714	Motor Vehicle Parts & Accessories	2	Gentex Corp Universal Automotive Industries Inc
3825	Instruments for Measures & Testing of Electricity & Electrical Signals	3	Data I/O Corp Teradyne Inc Wireless Telecom Group Inc
3826	Laboratory Analytical Instruments	3	FEI Co Waters Corp Molecular Devices Corp
3842	Orthopedic, Prosthetic & Surgical Appliances & Supplies	1	Invacare Corp
3845	Electromedical & Electrotherapeutic Apparatus	4	Spectranetics Corp Iridex Corp Affymetrix Inc Zevex International Inc
5411	Retail---Grocery Stores	4	Arden Group Inc Weis Markets Inc Safeway Inc Wild Oats Markets Inc
5812	Retail---Eating Places	17	McDonald's Corp Wendy's International Inc CEC Entertainment Inc O'Charley's Inc Panera Bread Co Checkers Drive-In Restaurant Lone Star Steakhouse Saloon Rare Hospitality International Inc Applebees International Inc Back Yard Burgers Inc Papa Johns International Inc Grill Concepts Inc Brazil Fast Food Corp Famous Daves of America Inc Friendly Ice Cream Corp

Table 4 (Continued)

5812	Retail---Eating Places		P F Changs China Bistro Inc Rubio's Restaurants Inc
5961	Retail---Catalog & Mail-Order Houses	5	Blair Corp Systemax Inc MediaBay Inc PC Connection Inc Gaiam Inc
7363	Services---Help Supply Services	4	Computer Horizons Corp Manpower Inc Administaff Inc Judge Group Inc
7370	Services---Computer Programming, Data Processing, Etc.	11	Earthlink Inc Cnet Networks Inc Pegasus Solutions Inc SM&A Corp Costar Group Inc Ebay Inc Edgar Online Inc Onesource Information Services Ask Jeeves Inc LookSmart LTD Akamai Technologies Inc
7372	Services---Prepackaged Software	38	Borland Software Corp THQ Inc Intrusion Inc Epicor Software Corp Peoplesoft Inc SPSS Inc Business Objects SA Applix Inc RSA Security Inc CenterSpan Communications Corp National Instruments Corp Legato Systems Inc Smith Micro Software Inc Advent Software Inc Citrix Systems Inc Accelrys Inc Documentum Inc Datatrak International Inc Siebel Systems Inc Mercator Software Inc

Table 4 (Continued)

7372	Services---Prepackaged Software		Realnetworks Inc Verisign Inc DoubleClick Inc MicroStrategy Inc Actuate Corp Entrust Inc Onyx Software Corp Vignette Corp Informatica Corp Marimba Inc Sagent Technology Inc Primus Knowledge Solutions LionBridge Technologies Inc Quest Software Inc Tumbleweed Communications Co Vitria Technology Inc BSquare Corp Interwoven Inc
7373	Services---Computer Integrated Systems Design	7	Unisys Corp Nyfix Inc Applied Digital Solutions BroadVision Inc Sabre Holdings Corp Packeteer Inc Cysive Inc
7389	Services---Business Services, NEC	2	Cass Information Systems Inc Freemarkets Inc
7990	Services---Miscellaneous Amusement & Recreation	6	MGM Mirage Azstar Corp MTR Gaming Group Inc Century Casinos Inc Ameristar Casinos Inc Bally Total Fitness Holdings CP
8731	Services---Commercial Physical & Biological Research	1	Pharmaceutical Product Development Inc

Table 5: Summary statistics

Variables	Mean	Standard Deviation	Median	Minimum	Maximum
DISC1 <sup>a</sup>	34	45.52	23	1	370
DISC2 <sup>a</sup>	29	42.10	18	1	334
DISC3 <sup>a</sup>	30	28.85	21	1	184
DISC4 <sup>a</sup>	25	25.70	17	1	155
INFASY	-4.45	0.87	-4.55	-6.42	-2.20
EQUITY	0.04	0.10	0.01	0.00	0.98
BLOCK	0.16	0.14	0.14	0.00	0.58
CONRTO	0.57	0.15	0.52	0.38	0.86
SPEED	1.50	1.58	1.39	0.11	14.17
CAPINT	0.40	0.34	0.29	0.02	1.60
ADVRTO	0.04	0.06	0.02	0.00	0.45
POLITIC	0.59	4.36	0.12	-1.36	53.23
UNION	0.041	0.052	0.020	0.014	0.367
SIZE <sup>a</sup>	7165.03	31017.86	394.96	4.66	250138.5

LDISC = the logarithm of the number of information items disclosed within year t.

INFASY = annual average of the logarithm of the daily relative bid-ask spread, which is the absolute value of bid-ask spread scaled by the average of bid and ask, in year t-1.

EQUITY = the amount raising from issuing common or preferred stock in year t+1 divided by total assets at the end of year t.

BLOCK = the percentage of shares held by stockholders that are unaffiliated with management in year t.

CONRTO = the ratio of top-four firms' sales divided by industrial sales (defined according to 4-digit SIC code) in year t.

SPEED = the speed of adjustment for positive abnormal profits for the industry (defined according to 4-digit SIC code) the firm operates in year t.

CAPINT = gross property, plant and equipment divided by total assets at the end of year t.

ADVRTO = advertising expenses divided by total sales in year t.

POLITIC = reported tax rate, which equals income taxes divided by the absolute value of pretax income in year t.

UNION = the percentage of employed workers who are union members in the industry (2, 3 or 4-digit SIC code) the firm operates in year t.

LSIZE = the logarithm of the multiple of common shares outstanding and the stock price at the end of year t.

a. DISC1, DISC2, DISC3, DISC4, and SIZE information are provided only for summary statistics. In the regression, the logarithms of these values (LDISC1, LDISC2, LDISC3, LDISC4 and LSIZE) are used. DISC1 includes all the information items disclosed. DISC2 includes only the proprietary information items disclosed. DISC3 includes all the information items disclosed, and only within the announcements that can be clearly identified as initiated by management. DISC4 includes only the proprietary information items disclosed, and only within the announcements that can be clearly identified as initiated by management. SIZE is the multiple of common shares outstanding and the stock price at the end of year t. SIZE figures are in million.



Table 6: Number of information items by industry

Panel A: All announcements, initiated by management and quoted from management (DISC1)

SIC code	Number of firms	Mean	Minimum	Maximum
1311	1	1		
2834	17	35	2	89
2836	2	24	21	26
3559	3	22	21	24
3576	4	30	7	56
3577	4	18	8	28
3661	4	29	14	46
3663	5	24	19	32
3674	6	116	13	370
3679	3	11	4	16
3714	2	16	7	24
3825	3	30	5	70
3826	3	18	8	28
3842	1	27		
3845	4	18	8	33
5411	4	16	1	27
5812	17	15	2	48
5961	5	10	2	17
7363	4	20	8	36
7370	11	36	1	97
7372	38	55	1	314
7373	7	37	4	95
7389	2	6	3	9
7990	6	14	4	23
8731	1	7		

Table 6 (Continued)

Panel B: Proprietary announcements, initiated by management and quoted from management (DISC2)

SIC code	Number of firms	Mean	Minimum	Maximum
1311	1	1		
2834	17	28	2	70
2836	2	22	17	26
3559	3	16	12	19
3576	4	26	4	49
3577	4	17	8	26
3661	4	25	7	41
3663	5	20	17	23
3674	6	104	11	334
3679	3	8	4	14
3714	2	11	1	21
3825	3	27	3	63
3826	3	14	6	26
3842	1	18		
3845	4	17	8	31
5411	4	8	1	16
5812	17	12	1	35
5961	5	7	1	15
7363	4	16	7	30
7370	11	31	1	90
7372	38	49	1	306
7373	7	32	3	88
7389	2	6	2	9
7990	6	8	1	15
8731	1	7		

Table 6 (Continued)

Panel C: All announcements, initiated by management only (DISC3)

SIC code	Number of firms	Mean	Minimum	Maximum
1311	1	1		
2834	17	32	2	81
2836	2	24	21	26
3559	3	21	19	24
3576	4	22	7	38
3577	4	13	5	26
3661	4	25	6	45
3663	5	21	9	30
3674	6	68	9	184
3679	3	11	4	16
3714	2	16	7	24
3825	3	28	5	65
3826	3	18	8	28
3842	1	24		
3845	4	17	4	33
5411	4	15	1	25
5812	17	15	2	48
5961	5	10	2	17
7363	4	20	8	34
7370	11	32	1	79
7372	38	47	1	146
7373	7	36	4	93
7389	2	6	3	9
7990	6	14	4	23
8731	1	7		

Table 6 (Continued)

## Panel D: Proprietary announcements, initiated by management only (DISC4)

SIC code	Number of firms	Mean	Minimum	Maximum
1311	1	1		
2834	17	26	2	66
2836	2	22	17	26
3559	3	16	10	19
3576	4	19	4	33
3577	4	12	5	24
3661	4	21	5	40
3663	5	18	7	23
3674	6	59	8	155
3679	3	8	4	14
3714	2	11	1	21
3825	3	26	3	60
3826	3	14	6	26
3842	1	16		
3845	4	16	4	31
5411	4	7	1	14
5812	17	11	1	35
5961	5	7	1	15
7363	4	15	7	28
7370	11	27	1	72
7372	38	41	1	132
7373	7	32	3	86
7389	2	6	2	9
7990	6	8	1	15
8731	1	7		

Table 7: Pearson correlations among variables

	LDISC1	LDISC2	LDISC3	LDISC4	INFASY	EQUITY	BLOCK	LOEPS	CONRTO	SPEED	CAPINT	ADVRTO	POLITIC	UNION
LDISC2	0.958 (0.001)													
LDISC3	0.985 (0.001)	0.940 (0.001)												
LDISC4	0.938 (0.001)	0.985 (0.001)	0.948 (0.001)											
INFASY	-0.571 (0.001)	-0.602 (0.001)	-0.553 (0.001)	-0.578 (0.001)										
EQUITY	-0.084 (0.298)	-0.073 (0.365)	-0.081 (0.315)	-0.073 (0.361)	0.084 (0.293)									
BLOCK	-0.109 (0.174)	-0.108 (0.179)	-0.097 (0.226)	-0.099 (0.218)	-0.121 (0.130)	0.118 (0.140)								
LOEPS	0.053 (0.509)	0.072 (0.373)	0.054 (0.503)	0.066 (0.409)	-0.121 (0.131)	0.107 (0.181)	0.052 (0.517)							
CONRTO	-0.107 (0.183)	-0.086 (0.285)	-0.131 (0.102)	-0.108 (0.178)	0.142 (0.076)	-0.002 (0.977)	0.044 (0.583)	0.020 (0.804)						
SPEED	-0.125 (0.118)	-0.096 (0.233)	-0.115 (0.150)	-0.083 (0.303)	-0.022 (0.789)	0.023 (0.776)	-0.085 (0.292)	-0.033 (0.679)	-0.089 (0.266)					
CAPINT	-0.218 (0.006)	-0.276 (0.001)	-0.202 (0.011)	-0.269 (0.001)	0.254 (0.001)	-0.021 (0.791)	0.057 (0.477)	-0.059 (0.466)	-0.106 (0.187)	-0.114 (0.157)				
ADVRTO	-0.047 (0.563)	-0.086 (0.287)	-0.040 (0.619)	-0.077 (0.336)	0.062 (0.440)	0.511 (0.001)	0.038 (0.635)	0.018 (0.820)	-0.097 (0.226)	0.010 (0.897)	-0.064 (0.426)			
POLITIC	0.155 (0.053)	0.152 (0.058)	0.155 (0.052)	0.153 (0.056)	-0.088 (0.272)	-0.013 (0.870)	0.051 (0.529)	0.060 (0.453)	-0.064 (0.425)	0.005 (0.946)	-0.047 (0.560)	-0.043 (0.589)		
UNION	-0.095 (0.236)	-0.178 (0.026)	-0.099 (0.219)	-0.191 (0.017)	0.031 (0.698)	-0.042 (0.598)	-0.064 (0.424)	0.073 (0.363)	0.063 (0.430)	-0.080 (0.319)	0.146 (0.069)	-0.142 (0.075)	-0.038 (0.634)	
LSIZE	0.572 (0.001)	0.547 (0.001)	0.561 (0.001)	0.530 (0.001)	-0.782 (0.001)	-0.097 (0.227)	0.012 (0.877)	0.012 (0.879)	-0.166 (0.038)	-0.014 (0.862)	-0.075 (0.349)	-0.038 (0.633)	0.069 (0.391)	0.075 (0.349)

p-values for two-tailed tests are provided in parentheses.

Number of observations = 157

LDISC = the logarithm of the number of information items disclosed within year t.

INFASY = annual average of the logarithm of the daily relative bid-ask spread, which is the absolute value of bid-ask spread scaled by the average of bid and ask, in year t-1.

EQUITY = the amount raising from issuing common or preferred stock in year t+1 divided by total assets at the end of year t.

BLOCK = the percentage of shares held by stockholders that are unaffiliated with management in year t.

LOEPS = 1 if basic earnings per share in year t is less than basic earnings per share in year t-1, 0 otherwise.  
CONRTO = the ratio of top-four firms' sales divided by industrial sales (defined according to 4-digit SIC code) in year t.  
SPEED = the speed of adjustment for positive abnormal profits for the industry (defined according to 4-digit SIC code) the firm operates in year t.  
CAPINT = gross property, plant and equipment divided by total assets at the end of year t.  
ADVRTO = advertising expenses divided by total sales in year t.  
POLITIC = reported tax rate, which equals income taxes divided by the absolute value of pretax income in year t.  
UNION = the percentage of employed workers who are union members in the industry (2, 3 or 4-digit SIC code) the firm operates in year t.  
LSIZE = the logarithm of the multiple of common shares outstanding and the stock price at the end of year t.

Table 8: Ordinary Least Squares (OLS) regression results for year 2001: initiated by management and quoted from management

25 industries, 157 firm-observations: disclosure variable includes announcements that are initiated by management and quoted from management

Model:

$$LDISC_{it} = \alpha_0 + \alpha_1 INFASY_{it-1} + \alpha_2 EQUITY_{it+1} + \alpha_3 INFASY_{it-1} * EQUITY_{it+1} + \alpha_4 LITIGA_{it} + \alpha_5 COMPETE_{it} + \alpha_6 POLITIC_{it} + \alpha_7 UNION_{it} + \alpha_8 LSIZE_{it} + \varepsilon_{it}$$

Panel A: disclosure variable: number of all information items (LDISC1)

	Model 1	Model 2	Model 3	Model 4
Intercept	0.4686 (0.84)	0.6826 (1.55)	0.7946 (1.63)	0.5262 (1.18)
INFASY	-0.4057 (-2.84)*	-0.4217 (-3.01)*	-0.3468 (-2.34)*	-0.4039 (-2.83)*
EQUITY	-2.2292 (-0.44)	-2.8850 (-0.59)	-2.1146 (-0.43)	-2.0989 (-0.41)
INFASY*EQUITY	-0.5425 (-0.42)	-0.7283 (-0.58)	-0.5004 (-0.39)	-0.5301 (-0.41)
LITIGA				
BLOCK	-1.3252 (-2.51)**	-1.4455 (-2.79)**	-1.2275 (-2.33)**	-1.3232 (-2.51)**
LOEPS	0.0519 (0.35)	0.0390 (0.27)	0.0503 (0.34)	0.0519 (0.35)
COMPETE				
CONRTO	0.0721 (0.15)			
SPEED		-0.1116 (-2.49)**		
CAPINT			-0.3039 (-1.34)	
ADVRTO				-0.2725 (-0.19)
POLITIC	0.0278 (1.68)*	0.0279 (1.73)*	0.0270 (1.65)	0.0275 (1.67)*
UNION	-2.6215 (-1.86)*	-2.8606 (-2.07)*	-2.3821 (-1.69)*	-2.6477 (-1.86)*
LSIZE	0.1576 (3.07)*	0.1500 (2.99)*	0.1706 (3.29)*	0.1576 (3.08)*
Adjusted R <sup>2</sup>	0.382	0.407	0.389	0.382
F Value	11.69	12.87	12.03	11.70
Pr > F	<0.0001	<0.0001	<0.0001	<0.0001

Panel B: disclosure variable: number of *proprietary* information items (LDISC2)

	Model 1	Model 2	Model 3	Model 4
Intercept	-0.5576 (-0.94)	-0.1847 (-0.39)	0.0600 (0.12)	-0.2882 (-0.61)
INFASY	-0.6275 (-4.12)*	-0.6382 (-4.26)*	-0.5377 (-3.42)*	-0.6189 (-4.09)*
EQUITY	-0.5980 (-0.11)	-1.6641 (-0.32)	-0.8025 (-0.15)	0.6111 (0.11)
INFASY*EQUITY	-0.1448 (-0.11)	-0.4335 (-0.32)	-0.1773 (-0.13)	0.0212 (0.02)
LITIGA				
BLOCK	-1.6429 (-2.92)**	-1.7390 (-3.13)**	-1.4838 (-2.65)**	-1.6433 (-2.94)**
LOEPS	0.0835 (0.52)	0.0732 (0.47)	0.0830 (0.53)	0.0821 (0.52)
COMPETE				
CONRTO	0.3124 (0.60)			
SPEED		-0.1073 (-2.24)**		
CAPINT			-0.4429 (-1.84)	
ADVRTO				-1.8580 (-1.24)
POLITIC	0.0286 (1.63)	0.0283 (1.64)	0.0272 (1.56)	0.0271 (1.55)
UNION	-4.6658 (-3.10)*	-4.8497 (-3.27)*	-4.2777 (-2.86)*	-4.8784 (-3.23)*
LSIZE	0.1172 (2.15)*	0.1075 (2.00)*	0.1341 (2.44)*	0.1189 (2.19)*
Adjusted R <sup>2</sup>	0.420	0.438	0.432	0.425
F Value	13.56	14.50	14.17	13.79
Pr > F	<0.0001	<0.0001	<0.0001	<0.0001

T-values are reported in parenthesis

\*: statistically significant at 5% level, one-tailed test

\*\*: statistically significant at 5% level, two-tailed test

LDISC = the logarithm of the number of information items disclosed within year t.

INFASY = annual average of the logarithm of the daily relative bid-ask spread, which is the absolute value of bid-ask spread scaled by the average of bid and ask, in year t-1.

EQUITY = the amount raising from issuing common or preferred stock in year t+1 divided by total assets at the end of year t.

BLOCK = the percentage of shares held by stockholders that are unaffiliated with management in year t.

LOEPS = 1 if basic earnings per share in year t is less than basic earnings per share in year t-1, 0 otherwise.

CONRTO = the ratio of top-four firms' sales divided by industrial sales (defined according to 4-digit SIC code) in year t.



SPEED = the speed of adjustment for positive abnormal profits for the industry (defined according to 4-digit SIC code) the firm operates in year t.  
CAPINT = gross property, plant and equipment divided by total assets at the end of year t.  
ADVRTO = advertising expenses divided by total sales in year t.  
POLITIC = reported tax rate, which equals income taxes divided by the absolute value of pretax income in year t.  
UNION = the percentage of employed workers who are union members in the industry (2, 3 or 4-digit SIC code) the firm operates in year t.  
LSIZE = the logarithm of the multiple of common shares outstanding and the stock price at the end of year t.

Table 9: Refined Ordinary Least Squares (OLS) regression results for year 2001: initiated by management

25 industries, 157 observations, disclosure variable includes only the announcements that are initiated by management

Model:

$$LDISC_{it} = \alpha_0 + \alpha_1 INFASY_{it-1} + \alpha_2 EQUITY_{it+1} + \alpha_3 INFASY_{it-1} * EQUITY_{it+1} + \alpha_4 LITIGA_{it} + \alpha_5 COMPETE_{it} + \alpha_6 POLITIC_{it} + \alpha_7 UNION_{it} + \alpha_8 LSIZE_{it} + \varepsilon_{it}$$

Panel A: disclosure variable: number of all information items (LDISC3)

	Model 1	Model 2	Model 3	Model 4
Intercept	0.7333 (1.34)	0.7872 (1.81)	0.8749 (1.82)	0.6447 (1.47)
INFASY	-0.3469 (-2.47)*	-0.3651 (-2.65)*	-0.3008 (-2.06)*	-0.3493 (-2.49)*
EQUITY	-2.5739 (-0.52)	-2.8020 (-0.58)	-2.1255 (-0.44)	-2.1964 (-0.43)
INFASY*EQUITY	-0.6286 (-0.50)	-0.7041 (-0.57)	-0.5041 (-0.40)	-0.5439 (-0.43)
LITIGA				
BLOCK	-1.1487 (-2.22)**	-1.2719 (-2.49)**	-1.0815 (-2.08)**	-1.1615 (-2.25)**
LOEPS	0.0597 (0.41)	0.0465 (0.32)	0.0567 (0.39)	0.0582 (0.40)
COMPETE				
CONRTO	-0.1350 (-0.28)			
SPEED		-0.0995 (-2.26)**		
CAPINT			-0.2578 (-1.15)	
ADVRTO				-0.1425 (-0.10)
POLITIC	0.0289 (1.78)*	0.0294 (1.85)*	0.0286 (1.77)*	0.0290 (1.79)*
UNION	-2.5887 (-1.87)*	-2.8397 (-2.08)*	-2.4228 (-1.75)*	-2.6351 (-1.88)*
LSIZE	0.1563 (3.11)*	0.1516 (3.07)*	0.1693 (3.33)*	0.1580 (3.15)*
Adjusted R <sup>2</sup>	0.361	0.382	0.366	0.361
F Value	10.79	11.71	11.02	10.77
Pr > F	<0.0001	<0.0001	<0.0001	<0.0001

Panel B: disclosure variable: number of *proprietary* information items (LDISC4)

	Model 1	Model 2	Model 3	Model 4
Intercept	-0.2568 (-0.43)	-0.0495 (-0.10)	0.2041 (0.39)	-0.1388 (-0.29)
INFASY	-0.5609 (-3.69)*	-0.5735 (-3.83)*	-0.4776 (-3.05)*	-0.5567 (-3.69)*
EQUITY	-0.5632 (-0.10)	-1.1857 (-0.23)	-0.4000 (-0.08)	0.8197 (0.15)
INFASY*EQUITY	-0.1199 (-0.09)	-0.2939 (-0.22)	-0.0600 (-0.04)	0.1062 (0.08)
LITIGA				
BLOCK	-1.4813 (-2.64)**	-1.5786 (-2.84)**	-1.3430 (-2.41)**	-1.4957 (-2.68)**
LOEPS	0.0810 (0.51)	0.0706 (0.45)	0.0788 (0.50)	0.0783 (0.49)
COMPETE				
CONRTO	0.1013 (0.20)			
SPEED		-0.0934 (-1.95)		
CAPINT			-0.4301 (-1.79)	
ADVRTO				-1.6436 (-1.10)
POLITIC	0.0299 (1.71)*	0.0300 (1.73)*	0.0289 (1.67)*	0.0289 (1.65)
UNION	-4.8367 (-3.22)*	-5.0291 (-3.39)*	-4.4981 (-3.01)*	-5.0579 (-3.35)*
LSIZE	0.1178 (2.16)*	0.1111 (2.07)*	0.1363 (2.49)*	0.1211 (2.23)*
Adjusted R <sup>2</sup>	0.392	0.407	0.405	0.397
F Value	12.19	12.92	12.80	12.41
Pr > F	<0.0001	<0.0001	<0.0001	<0.0001

T-value is reported in parenthesis

\*: statistically significant at 5% level, one-tailed test

\*\*: statistically significant at 5% level, two-tailed test

LDISC = the logarithm of the number of information items disclosed within year t.

INFASY = annual average of the logarithm of the daily relative bid-ask spread, which is the absolute value of bid-ask spread scaled by the average of bid and ask, in year t-1.

EQUITY = the amount raising from issuing common or preferred stock in year t+1 divided by total assets at the end of year t.

BLOCK = the percentage of shares held by stockholders that are unaffiliated with management in year t.

LOEPS = 1 if basic earnings per share in year t is less than basic earnings per share in year t-1, 0 otherwise.

CONRTO = the ratio of top-four firms' sales divided by industrial sales (defined according to 4-digit SIC code) in year t.

SPEED = the speed of adjustment for positive abnormal profits for the industry (defined according to 4-digit SIC code) the firm operates in year t.  
CAPINT = gross property, plant and equipment divided by total assets at the end of year t.  
ADVRTO = advertising expenses divided by total sales in year t  
POLITIC = reported tax rate, which equals income taxes divided by the absolute value of pretax income in year t.  
UNION = the percentage of employed workers who are union members in the industry (2, 3 or 4-digit SIC code) the firm operates in year t.  
LSIZE = the logarithm of the multiple of common shares outstanding and the stock price at the end of year t.

Table 10: Ordinary Least Squares (OLS) regression results for year 2002: initiated by management and quoted from management

18 industries, 60 firm-observations: disclosure variable includes announcements that are initiated by management and quoted from management

Model:

$$LDISC_{it} = \alpha_0 + \alpha_1 INFASY_{it-1} + \alpha_2 EQUITY_{it+1} + \alpha_3 INFASY_{it-1} * EQUITY_{it+1} + \alpha_4 LITIGA_{it} + \alpha_5 COMPETE_{it} + \alpha_6 POLITIC_{it} + \alpha_7 UNION_{it} + \alpha_8 LSIZE_{it} + \varepsilon_{it}$$

Panel A: disclosure variable: number of all information items (LDISC1)

	Model 1	Model 2	Model 3	Model 4
Intercept	0.4295 (0.56)	1.6604 (3.08)	1.0632 (1.77)	1.2150 (2.09)
INFASY	-0.2138 (-1.48)	-0.1355 (-0.99)	-0.2134 (-1.45)	-0.2030 (-1.39)
EQUITY	18.8107 (1.95)*	18.3908 (2.13)*	15.3342 (1.64)	12.2616 (1.19)
INFASY*EQUITY	3.5911 (1.78)*	3.4953 (1.96)*	2.7854 (1.45)	2.0710 (0.95)
LITIGA				
BLOCK	-0.2564 (-0.36)	-0.2906 (-0.44)	-0.1513 (-0.21)	-0.2683 (-0.37)
LOEPS	0.1175 (0.57)	0.0914 (0.48)	0.1264 (0.60)	0.1020 (0.48)
COMPETE				
CONRTO	0.8645 (1.19)			
SPEED		-0.8398 (-3.03)**		
CAPINT			0.0196 (0.06)	
ADVRTO				-3.2039 (-0.68)
POLITIC	-0.2463 (-1.38)	-0.1997 (-1.19)	-0.2571 (-1.39)	-0.2585 (-1.43)
UNION	-3.8761 (-1.90)*	-3.7492 (-1.98)*	-3.6023 (-1.75)*	-4.0423 (-1.88)*
LSIZE	0.2551 (2.93)*	0.3226 (3.85)*	0.2231 (2.66)*	0.2260 (2.70)*
Adjusted R <sup>2</sup>	0.314	0.404	0.295	0.301
F Value	4.00	5.45	3.74	3.82
Pr > F	0.0007	<0.0001	0.0012	0.0010

Panel B: disclosure variable: number of *proprietary* information items (LDISC2)

	Model 1	Model 2	Model 3	Model 4
Intercept	0.3966 (0.48)	1.4374 (2.49)	0.7377 (1.15)	0.9586 (1.54)
INFASY	-0.2111 (-1.36)	-0.1288 (-0.88)	-0.2142 (-1.37)	-0.2006 (-1.28)
EQUITY	16.7895 (1.62)	17.7613 (1.93)*	14.7870 (1.48)	11.4634 (1.04)
INFASY*EQUITY	3.0102 (1.39)	3.23225 (1.70)*	2.4878 (1.21)	1.7696 (0.76)
LITIGA				
BLOCK	0.0383 (0.05)	-0.0403 (-0.06)	0.1030 (0.13)	-0.0098 (-0.01)
LOEPS	0.0626 (0.28)	0.0317 (0.15)	0.0712 (0.32)	0.0443 (0.20)
COMPETE				
CONRTO	0.5670 (0.73)			
SPEED		-0.8874 (-3.00)**		
CAPINT			0.1121 (0.32)	
ADVRTO				-3.1957 (-0.63)
POLITIC	-0.3287 (-1.71)*	-0.2759 (-1.54)	-0.3471 (-1.76)*	-0.3378 (-1.75)*
UNION	-3.4540 (-1.57)	-3.4314 (-1.70)*	-3.2971 (-1.50)	-3.7148 (-1.62)
LSIZE	0.2425 (2.59)*	0.3267 (3.65)*	0.2229 (2.49)*	0.2244 (2.52)*
Adjusted R <sup>2</sup>	0.285	0.388	0.279	0.284
F Value	3.62	5.16	3.54	3.59
Pr > F	0.0016	<0.0001	0.0018	0.0016

T-values are reported in parenthesis

\*: statistically significant at 5% level, one-tailed test

\*\* : statistically significant at 5% level, two-tailed test

LDISC = the logarithm of the number of information items disclosed within year t.

INFASY = annual average of the logarithm of the daily relative bid-ask spread, which is the absolute value of bid-ask spread scaled by the average of bid and ask, in year t-1.

EQUITY = the amount raising from issuing common or preferred stock in year t+1 divided by total assets at the end of year t.

BLOCK = the percentage of shares held by stockholders that are unaffiliated with management in year t.

LOEPS = 1 if basic earnings per share in year t is less than basic earnings per share in year t-1, 0 otherwise.

CONRTO = the ratio of top-four firms' sales divided by industrial sales (defined according to 4-digit SIC code) in year t.

SPEED = the speed of adjustment for positive abnormal profits for the industry (defined according to 4-digit SIC code) the firm operates in year t.  
CAPINT = gross property, plant and equipment divided by total assets at the end of year t.  
ADVRTO = advertising expenses divided by total sales in year t.  
POLITIC = reported tax rate, which equals income taxes divided by the absolute value of pretax income in year t.  
UNION = the percentage of employed workers who are union members in the industry (2, 3 or 4-digit SIC code) the firm operates in year t.  
LSIZE = the logarithm of the multiple of common shares outstanding and the stock price at the end of year t.

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