INFORMEDNESS AND CONSENSUS OF ACCOUNTING DISCLOSURES UNDER SECTION 302 OF THE SARBANES-OXLEY ACT: HIGH-TECH FIRMS VERSUS LOW-TECH FIRMS

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Abstract

This paper draws from the theory explored by Holthausen and Verrecchia (1990) on price and volume behavior and examines initial effects of the overall information contained in 10-Q reports of high-tech firms vis-à-vis low-tech firms on investors' informedness and consensus when Section 302 of the Sarbanes-Oxley Act took effect in 2002. Consistent with the reinforcing effects of informedness and consensus on trading volume, we find that trading volume has decreased post SOX for both high-tech and low-tech firms when we investigate investors' response during a short event window around quarterly reporting dates. However, the effects of informedness and consensus on stock return variability are countervailing, and therefore any decrease or increase in stock return variability depends upon which of the two effects dominates in a particular informational setting. The decrease in stock return variability is found only in high-tech firms, which can be explained by the implementation of more conservative accounting methods in the high-tech sector.

Keywords: High-Tech, Informedness, Consensus, Sarbanes-Oxley Act

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Introduction

This study examines the overall information content of 10-Q reports for high-tech firms, relative to low-tech firms, when disclosures based on Section 302 of Sarbanes-Oxley Act (hereafter SOX 302) were required for the first time by the US Securities and Exchange Commission (SEC). This study assumes that the information content of 10-Q reports is reflected in investors' informedness and consensus. Informedness is defined as the extent to which financial statement users become more knowledgeable about the firm's expected dividends, and consensus is defined as whether these users agree on the signal presented in the accounting information, upon the release of financial statements (Holthausen and Verrecchia 1990).[1]

SOX 302 required the SEC in the United States to adopt final rules to be effective by August 29, 2002 under which principal officers of a firm certify in each quarterly (i.e., Form 10-Q) and annual report (i.e., Form 10-K) that the signing officers have evaluated

[1] In this paper, we use such terms as informedness and information usefulness (information content) interchangeably. Also, the terms of reliability and credibility are interchangeably used. It is implicitly assumed that both relevance and reliability affect informedness and consensus because relevance and reliability are two primary information qualities identified by the Financial Accounting Standards Board.(FASB) in the Statement of Financial Accounting Concepts No. 2.

and presented their conclusions about the effectiveness of their internal controls based on their evaluations.[2]

One of the main objectives of SOX is to restore investor confidence through a series of new reporting requirements such as disclosure of internal controls effectiveness, an increase in transparency regarding off-balance sheet accounting, and certification of financial statements by chief executive officers and chief financial officers.[3] It is, therefore, constructive to examine whether the reforms have an impact on investors' use of financial statements. Since these disclosure requirements evolve over time and their effects on investor response can be either countervailing or reinforcing, it would be much more complicated to examine the effect of any single disclosure requirement (e.g., internal control disclosure) on investor response in later periods than in earlier periods after the enactment of SOX. These concerns lead the current study to focus on the initial effect of the overall information disclosed in Form 10-Q reports following SOX 302 before other disclosure requirements became effective. Also, unless we fully understand the effects of each disclosure requirement on investors' response, it would be very difficult to refine SOX's disclosure-based regulations in order to meet the overall objective of SOX.

Unlike recent studies such as Doyle et al. (2007), Beneish at al. (2008), Hammersley et al. (2008), Ashbaugh-Skaife (2008), and Ashbaugh-Skaife (2009), which use firms that disclose internal control weaknesses to examine the relationship between accruals quality and internal control, how changes in internal control quality affect firm risk and cost of equity, or market reactions to internal control weaknesses, this study investigates how managers place information in their 10-Q reports as a result of SOX 302 required disclosures and uses firms that did not report any significant internal control deficiencies. In other words, this study differentiates itself from the above studies in that it does not examine market reactions to disclosure of internal control weaknesses because both high-tech and low-tech firms in this study indicated in their 10-Q reports that they did not have any internal control deficiency problems at least during the sample period.

Recent studies on the effects of SOX on financial reporting find that accounting numbers became more conservative when compared to those from the period prior to the regulation. Lobo and Zhou (2006) find that firms report lower discretionary accruals and report losses more quickly than gains when they report income after SOX. Cohen at el. (2005) also report that firms have significantly higher discretionary accruals prior to SOX and discretionary accruals decrease after the passage of SOX. These results provide evidence that management teams may have responded to the regulation by reducing aggressive earnings management behavior. The results are also consistent with increasing litigation costs following SOX, which decreases management's incentive to report aggressive accounting results or make voluntary management disclosures.[4]

To the extent that accounting becomes more conservative, reliability of such information will increase, however, it could also be at the expense of relevance since firms will be reluctant to provide forward-looking information that is less verifiable or use accruals to signal future performance.[5] In this line of research, LaFond and Watts (2008) and Skinner (1994), suggest that conservatism reduces the extent of information asymmetry by increasing the speed with which negative information is revealed in the earnings numbers. Specifically, because management has an incentive to inflate accounting earnings, reports of negative financial results are more ***reliable*** than those of positive financial results. More recently, Hui et al. (2009) find a significant negative association between conservatism measures and the frequency, specificity, and timeliness of management forecasts. They also document that conservatism reduces the need to preempt bad news, suggesting that accounting conservatism acts as a substitute for management forecasts by decreasing information

[2] Section 404 of SOX (effective November 15, 2004 for accelerated filers only) also requires management to issue a report on internal control over financial reporting. In addition, it requires that management's assessment of the effectiveness of internal control over financial reporting be audited by the auditor of its financial statements. Section 302 is implemented through both annual (10-K) and quarterly (10-Q) reports whereas Section 404 is implemented through only annual reports.

[3] The direct impact of SOX on disclosures is more comprehensive than that discussed here. For example, SOX requires disclosure of material changes in the financial condition or operations on a rapid and current basis through Form 8-K under Section 409 (*Effective Date*: August 23, 2004). Section 401(a) required disclosure in Management's Discussion and Analysis about Off-BalanceSheet Arrangements and Aggregate Contractual Obligations and was effective June 15, 2003 through annual reports. Another disclosure requirement introduced by SOX is the timely filing of insider transactions through Form 4 under Section 403 (*Effective Date*: August 29, 2002).

[4] This paper focuses on the overall information content of the 10-Q report. For example, Item 2 (Management's Discussion and Analysis of Financial Condition and Results of Operations) includes forward-looking statements, and managers might be more conservative in discussing the future performance and cash flows post-SOX.

[5] Johnson et al. (2001) evaluate corporate voluntary disclosures of forward-looking information under the safe harbor provision of the Private Securities Litigation Reform Act of 1995. Examples of forward-looking information include earnings projections, sales projections, market share projections, and other financial projections & statements.

asymmetry in the market and reducing potential litigation through the timely reporting of bad news.

Our research extends these recent studies and investigates whether the informedness and consensus of financial information have changed due to the increase in reliability in accounting reports. Internal control information required under SOX 302 is expected to enhance reliability, vis-à-vis relevance, of financial statements. A firm's management would be less likely to voluntarily place less reliable, though sufficiently relevant, accounting information and intentionally biased accruals through earnings management on Form 10-Q reports following SOX 302 due to the pressure to certify the effectiveness of the firm's internal control system. In relation to this, Ashbaugh-Skaife et al. (2008) specifically indicate, "Overall, better internal control leads to more reliable recorded amounts useful in conducting daily activities such as production, sales, and management of inventory, as well as reducing unintentional misstatements in external financial statements. Conversely, weak internal control introduces noise and /or bias into accruals that adversely affect the quality of both internal and externally reported accounting numbers."

We posit that firms with higher expected litigation costs are more likely to be affected by SOX 302 and thus report more conservative accounting information.[6] Firms in the high-tech industry are believed to be riskier and are associated with higher litigation costs (Jones and Raghunanda 1998; Johnson, Kasznik and Nelson 2001). Furthermore, firms with higher litigation costs are more likely to engage in conservative accounting (Watts 2003). Kwon et al. (2006) also find that high-tech firms are more conservative in their accounting relative to low-tech firms. Therefore, we hypothesize that firms in high-tech industries are more likely to be affected by internal control effectiveness disclosures required under SOX 302 than low-tech firms. Accordingly, we test stock price variability and trading volume behavior separately for these two industries.

Our sample includes 365 high-tech firms and 74 low-tech firms with available data from 1998 to 2004. We examine the market reaction to quarterly reports (10-Q) one quarter prior to SOX 302 and one quarter following SOX 302 and find that stock price variability has more significantly decreased for high-tech firms than for low-tech firms in both univariate and multivariate tests, and trading volume (or its variability) has significantly decreased for both high-tech and low-tech firms in univariate tests, suggesting that a decrease in informedness is accompanied by an increase in consensus.[7]

The increase in consensus revealed in this paper's main results of stock price variability and trading volume is further supported by a decrease in analysts' forecast dispersion. Moreover, the informedness effect outweighs the consensus effect for high-tech firms. The results are, however, inconclusive for low-tech firms. Although we find a reduction in trading volume for low-tech firms, there is no change in stock price variability. The results together suggest that the informedness of accounting information has decreased more than the increase in consensus of such information in high-tech firms, but not in low-tech firms.[8]

We interpret the results as the possibility that high-tech firms, facing higher litigation costs, adopt more reliable reporting and forego voluntary disclosure of more relevant but less accurate information in their accounting reports.[9] These results

[6] Recent studies identify two types of accounting conservatism. The first type is ex ante conservatism, which is also called balance sheet related, unconditional, or news independent conservatism (Beaver and Ryan 2004; Chandra et al. 2004; and Richardson and Tinaikar 2004). Ex ante conservatism reflects the understatement of book values of net assets through the application of GAAP or a firm's policies that reduce earnings independent of current financial and economic news (e.g., the immediate expensing of R&D and advertising expenditures, and the accelerated depreciation of property, plant, and equipment. The second type of conservatism is ex post conservatism, which is also called income statement related, conditional, or news dependent conservatism (Richardson and Tinaikar 2004; Pae et al. 2005; Chandra et al. 2004; Beaver and Ryan 2004, Basu 1997; and Ball and Shivakumar 2006). Ex post conservatism is associated with the more timely recognition of economic losses than gains, consistent with the definition given by Basu (1997). The conservatism measures adopted in this paper are consistent with the definition of ex post conservatism because they directly relate to managerial discretion/manipulation in financial reporting.

[7] A decrease in trading volume following SOX 302 for both high-tech and low-tech firms in multivariate tests is confirmed by a negative sign of the post-SOX period dummy variable, but its magnitude is not statistically significant probably because the multivariate model, which was intended to be used for price tests in a prior study, turns out to be inadequate for testing volume changes.

[8] Since the effects of informedness and consensus on trading volume are reinforcing, a decrease in trading volume should be found in both high-tech and low-tech samples. However, the effects of informedness and consensus on the stock return variability are countervailing, and therefore any decrease or increase in stock return variability depends upon which of the two effects dominates in a particular informational setting.

[9] Studies on accounting numbers' informativeness generally do not separate the effect of change in relevance and reliability. The validity of our interpretation that in terms of magnitude, the decrease in relevance is greater than the increase in reliability, is based on the assumption that Section 302 of SOX promotes higher reliability in financial reporting. As the results in both stock price variability and trading volume (or its variability) tests indicate lower informedness, we interpret the results as the decrease in

are also consistent with those of Cahan and Zhang (2006), who document negative abnormal accruals for ex-Anderson clients in the post-Enron period and conclude that auditors require clients to use conservative accounting policies in order to reduce the auditior's litigation risk. Our empirical tests based upon non-operating accruals and performance-matched discretionary accruals as proxies to measure accounting conservatism, as well as the Basu (1997) measure of conservatism are consistent with the above conjecture that the increased level of conservatism in financial reporting is more for high-tech firms than for low-tech firms following SOX.

This paper's contributions to existing literature are in the following three areas. First, Holthausen and Verrecchia (1990) note that when common noise in accounting information increases, informedness decreases but consensus increases.[10] In addition, this decrease in informedness is associated with a decrease in stock return variability and a decrease in trading volume, whereas the increase in consensus is associated with an increase in stock return variability and a decrease in trading volume. Consistent with these predictions by Holthausen and Verrecchia (1990), we find that trading volume has decreased post SOX for both high-tech and low-tech firms when we investigate investors' response during a short window around quarterly report dates. Since the effects of informedness and consensus on trading volume are reinforcing, the decrease in trading volume should be found in both high-tech and low-tech samples. However, the effects of informedness and consensus on stock return variability are countervailing, and therefore any decrease or increase in stock return variability depends upon which of the two effects dominates in a particular informational setting. The decrease in stock return variability is found only in high-tech firms, which can be explained by the implementation of more conservative accounting methods in the high-tech sector.

Second, Hui et al. (2009) suggest that a firm's accounting conservatism is negatively associated with management's issuance of quantitative earnings forecasts (management voluntary disclosures) and reduces information asymmetry. In addition, LaFond and Watts (2008) and Li Jing (2008) suggest that conservatism accelerates the recognition of bad news in earnings, increasing the ***reliability*** of reported earnings. This research confirms these results in that high-tech firms, which adopt more conservative (reliable) reporting, engage in less voluntary (relevant) management disclosures in the post-SOX period.

Third, the evidence of differential market reactions between high-tech and low-tech firms to post-SOX accounting disclosures and the evidence of changes in conservatism levels between pre- and post-SOX periods for high-tech firms have the potential to provide useful SOX feedback to accounting-policy makers and regulators.

The remainder of this study is organized into four sections. The second section develops the hypotheses by exploring and discussing previous relevant research. The third section describes sample selection procedures and research design. Section four presents the results of empirical tests on stock price variability, and trading volume variability between pre-SOX and post-SOX periods for high-tech versus low-tech firms. Concluding comments can be found in the final section.

2. Hypotheses Development

2.1 Theoretical models on information and market reaction

Ohlson (1979) provides an analytical model that links additional information disclosure and stock price variability under a setting of uncertainty. In his model, information is viewed as a state descriptor helpful in assessing the probability distribution of states in a capital asset valuation model. As information becomes publicly available in financial reporting, investors can be expected to update their beliefs (i.e., their prior probability distributions about the changed states of nature). Using a simple linear asset pricing model (which is assumed to specify information dynamics), Ohlson shows that stock prices have a higher variance when the reporting environment provides more information to enhance estimation of a firm's expected dividends. That is, more state descriptors are revealed in a reporting environment yielding a greater revision of previous predictions of probabilities and outcomes.

In addition, using a two-period rational expectations model in which investors are diversely informed and differ in the precision of their private information, Kim and Verrecchia (1991) demonstrate that stock return variability at the time of a public disclosure increases with the information content of the disclosed information and decreases with the amount of the preannouncement public and private information. In other words, investors respond stronger to the disclosure as the quality of the disclosed information (finer information environment) increases. Consistent with the predictions made in these theoretical studies, Swaminathan (1991), Lobo et al. (1998) and Kwon (1993) find significant stock

relevance dominating the increase in reliability. Several recent studies that investigate the impact of SOX on reported financial information also support the view that the intention of SOX was to increase financial statement accuracy (reliability). These studies include, among others, Heflin and Hsu (2004), Cohen et al. (2005), Lobo and Zhou (2006), and Li et al. (2006).

[10] Previous studies on mandatory disclosures focus on stock price reaction and do not separate out informedness from consensus effects (Ettredge et al. 2002 and Berger et al. 2003 on SFAS 131).

price reactions at the time of release of line-of-business information, SFAS No. 14 segment information, and inflation-adjusted information disclosures relating to Accounting Series Release No. 190, respectively. More recently, Bushee et al. (2004) find stock price variability increases during management conference calls with financial analysts after the Regulation Fair Disclosure.

While these models focus on the relation between stock price variability and information disclosure, they do not predict any trading volume reaction in terms of informedness and consensus that generally occur jointly when information is disseminated (Holthausen and Verrecchia 1990). Beaver (1968) finds that earning announcements trigger abnormal trading responses. It is believed, however, that trading volume is a noisier measure than stock price (Kim and Verrecchia 1991). Holthausen and Verrechia (1990) develop a model to explain how both stock price variability and trading volume are valid metrics to examine effects of information disclosure. Specifically, they propose that there are two effects simultaneously affecting market response to new information disclosure: informedness and consensus. Informedness is defined as the extent to which financial statement users become more knowledgeable about the firm's expected dividends, and consensus is defined as whether these users agree on the signal presented in the accounting information, upon the release of financial information. More specifically, their model of an information signal consists of three components as follows:

$$Y_a = D + C + I_a$$

During the period, each agent receives an information signal and interprets what the information signal Y_a implies about the liquidating dividend of the risky asset (D). D has a normal distribution with mean m and variance v. C is a common noise term that has a normal distribution with mean zero and variance n. I_a is an idiosyncratic noise term that has a normal distribution with mean zero and variance s. Furthermore, the idiosyncratic noise terms are assumed to be independent across agents.

Holthausen and Verrechia (1990) argue that as the variance of common noise (n) increases, informedness tends to be reduced because greater noise in agents' information makes agents less knowledgeable.[11] Simultaneously, an increase in n is likely to increase the consensus because the agents' estimation errors are highly correlated. Since an increase in n works to decrease informedness and increase consensus, its effect on the variance of unexpected price changes is ambiguous, whereas it is likely to decrease trading volume unambiguously.

Reporting on the effectiveness of internal controls under SOX 302 likely will increase reliability of accounting information. Management will have less discretion in manipulating financial results, which is consistent with the results found by Cohen et al. (2005) and Lobo and Zhou (2006). Therefore, it would be interesting to examine, through measuring informedness and consensus of primary market participants (i.e., investors), The causal relation might exist between these additional internal control effectiveness disclosures that are required by SOX 302 and how managers place information in their 10-Q reports (i.e., the overall information content of the 10-Q report).

In accordance with Holthausen and Verrechia's (1990) model, we posit that mandatory disclosures (SOX 302) aiming at curtailing aggressive accounting behavior and increasing the reliability of accounting numbers are likely to change the variance of common noise. More specifically, consensus will increase because the new internal control effectiveness information is supposed to enhance the reliability of accounting information. Whether informedness will change, however, remains an empirical question. As a result of Section 302 internal control effectiveness disclosures, if firms choose to report more conservative accounting numbers in favor of reliability to lower expected litigation costs at the expense of relevance and the amount of a decrease in relevance eclipses the amount of an increase in reliability, Investors' informedness on the firm's future dividends is likely reduced. Hui et al. (2009) support this conjecture by documenting evidence of a significantly negative association between the conservatism measures and the number of quantitative management forecasts.[12]

Furthermore, firms with higher litigation costs are likely to be more affected by SOX 302. Recent studies find that high-tech firms are riskier and are more susceptible to higher litigation risks. Johnson et al. (2003) find that high-tech firms increased disclosure of management forecasts after the Safe Harbor Act, which protects them from being sued for making forward-looking statements because they face

[11] In the case of SOX 302, insofar as managers respond to the new regulation by engaging in conservative financial reporting through increasing the reliability of accounting information disclosures at the expense of more relevant information about future cash flows and increasing the use of income decreasing discretionary accruals to reduce the expected litigation costs, the variance of the common noise component of the agent's information increases because the market agents now have less information (more uncertainty) in assessing a firm's future cash flows. This implies that the management certification statement on the effectiveness of a firm's internal control procedures disclosed under Section SOX 302 may have resulted, at least initially, in a loss of relevance that was not fully compensated by an increase in reliability of the financial statement information contained in Form 10-Q reports following SOX.

[12] Hui et al. (2009) analyze a sample of management forecasts issued from 1997 to 2002 by 2244 firms. They directly relate a firm's voluntary disclosure decision to the degree of conservatism in the accounting system.

higher litigation costs than low-tech firms prior to the Act. Kwon et al. (2006) also provide evidence that, contrary to prior beliefs, high-tech firms report more conservative accounting numbers than low tech firms. They explain that the nature of high-tech businesses may provide one possible reason for these differences.

High-tech firms must invest more in such intangible assets as R&D, human resources, customer acquisition, brand development, and other information technology when compared to low-tech firms.[13] To survive in the fast-changing, fiercely competitive high-tech market, these firms also incur greater and more frequent unusual or nonrecurring expenses, including inventory write-downs, restructuring/reorganization expenses, and write-downs or write-offs of receivables and intangibles that potentially lower their earnings estimates, thereby resulting in the reporting of more conservative accounting numbers.[14] In addition, Watts (2003) provides arguments that firms with higher litigation costs are more likely to report earnings conservatively. Therefore, combining the expected litigation costs and the nature of more conservative financial reporting, we expect that the regulation will make a greater impact on high-tech firms than low-tech firms.

As Holthausen and Verrechia's (1990) predict, the effects of informedness and consensus on trading volume are reinforcing when common noise increases. Therefore, a decrease in trading volume is expected to be found in both high-tech and low-tech samples. However, the effects of informedness and consensus on stock return variability are countervailing, and therefore any decrease or increase in stock return variability depends upon which of the two effects dominates in a particular informational setting (high-tech vs. low-tech). Since high-tech industries, relative to low-tech industries, implement more conservative accounting methods, we predict that the effect of informedness on stock return variability will dominate the effect of consensus on stock return variability for high-tech firms. On the basis of the above arguments and predictions, the following hypotheses are developed in their alternate forms:

H1: Stock return variability is lower for high-tech firms in the post-SOX period than in the pre-SOX period during quarterly reporting.

H2: Trading volume is lower for both high-tech and low-tech firms in the post-SOX period than in the pre-SOX period during quarterly reporting.

H3: The level of accounting conservatism is higher for high-tech firms in the post-SOX period than in the pre-SOX period during quarterly reporting.

H4: The level of accounting conservatism is higher for high-tech firms than for low-tech firms in the post-SOX period.

3. Sample Selection and Research Design

3.1 Sample Selection and Descriptive Statistics

Financial data are collected from COMPUSTAT, stock return data are obtained from CRSP, institutional ownership data are collected from the TFSD Ownership Database, and security analysts' forecast data are retrieved from the I/B/E/S file. We collect the announcement dates of 10-Q reports from the SEC's EDGAR database. To compare quarterly reports that were issued around the birth of SOX, the last quarter in the pre-SOX period and the first quarter that reports internal control related information in the post-SOX period are used.[15] Although we confirmed management certifications and internal control deficiency disclosures made in Form 10-Q reports for all of the high-tech and low-tech firms in the above post-Sox period, some prior research papers (e.g., Ashbaugh-Skaife et al. [2008, p. 222]) maintain that such certifications and disclosures under SOX 302 began appearing in 2003. Therefore, we also compare quarterly reports one quarter prior to SOX with those of the first quarter in 2003.

[13] Prior research uses market-to-book value of asset (MTBA) as a proxy for a firm's growth opportunities (Smith and Watts [1992]) and R&D spending as a percentage of total assets (RNDA) as a proxy for a firm's investment in unrecorded intangible assets (Francis and Schipper [1999]). The average MTBA and RNDA for high-tech (low-tech) firms are 3.2113 (1.9069) and 0.1037 (0.0208), respectively, in this study. The differences in these ratios between the two groups are significant at the .001 level.

[14] Kwon [2002] reports that expenditures on special items in high-tech firms are anywhere between three and twenty-eight times greater than those in low-tech firms during the period of 1990-97.

[15] All quarterly reports with respect to the disclosure of internal control effectiveness are closely examined around the SOX enactment date. A typical report on internal control effectiveness is presented in Appendix A. Only a few companies (3 out of 144) in the high-tech industries provided an extensive disclosure relating to internal control and procedures. Examples are Bristol-Myers Squibb company (2 pages), Intel Corporation (Appendix B, 2 pages), and Sicor Inc. (11 pages).

Table 1-A. High-tech (HT) and Low-tech (LT) Firms

	HT [LT]					
	1998	**1999**	**2000**	**2002**	**2003**	**2004**
Francis and Schipper's (1999) classification of high-(low-) tech firms	**2706 [984]**	**2706 [984]**	**2706[984]**	**2706[984]**	**2706[984]**	**2706[984]**
***Add*: CNN tech firms *not* in FS**	**22**	**22**	**22**	**22**	**22**	**22**
	2728 [984]	**2728 [984]**	**2728[984]**	**2728[984]**	**2728[984]**	**2728[984]**
***Deduct*: Missing Forecast data in the IBES file [863]**	**2298 [758]**	**2331 [785]**	**2418[816]**	**2518[865]**	**2495[865]**	**2465**
	430 [226]	**397 [199]**	**310 [168]**	**210[119]**	**233[119]**	**263 [121]**
***Deduct*: Missing Compustat Data, Missing 10-Q dates, and Other reduction of the number of Observations to achieve Equal Size across all years**	**312[184]**	**279 [157]**	**192[126]**	**92[77]**	**115[77]**	**145 [79]**
Same Firms across all six fiscal years for matched comparison tests	**118 [42]**	**118 [42]**	**118 [42]**	**118[42]**	**118[42]**	**118 [42]**

Stock Return Variability, Trading Volume, and Forecast Dispersion Tests: 144[85] firms

Descriptive Statistics and Conservatism Tests: 118 [42] firms (constant sample across 1998-2004)

Basu's Conservatism Tests: 1168 [715] firms-years for HT [LT] over the period 1998-2004

Final Sample Firms which appear at least once during the period from 1998 to 2004: 365 [74] firms

Table 1-B. Three-digit SIC Composition of High-tech and Low-tech Firms

3-digit SIC	Industry	Number of firms	%
Panel A: High-Tech Firms [HT]			
283	Drugs	58	15.8

355	Special Industry Machinery	1	0.3
357	Computer and Office Equipment	48	13.2
360	Electronic & Other Electric Equipment	2	0.5
361	Electric Distribution Equipment	2	0.5
362	Electrical Industrial Apparatus	3	0.8
363	Household Appliances	2	0.5
364	Electric Lighting and Wiring Equipment	3	0.8
365	Household Audio and Video Equipment	3	0.8
366	Communications Equipment	35	9.6
367	Electronic Components and Accessories	66	18.1
369	Misc. Electrical Equipment & Supplies	5	1.4
381	Search and Navigation Equipment	1	0.3
382	Measuring and Controlling Devices	1	0.3
481	Telephone Communications	7	1.9
484	Cable and Other Pay TV Services	1	0.3
489	Communications Services, NEC	1	0.3
573	Radio, TV, & Electronic Stores	1	0.3
679	Miscellaneous Investing	1	0.3
737	Computer and Data Processing Services	120	32.9
873	Research and Testing Services	4	1.1
	Total	365	100%

Panel B: Low-Tech Firms (LT)

240	Lumber and Wood Products	2	2.7
243	Millwork, Plywood & Structural Members	1	1.4
245	Wood Buildings and Mobile Homes	1	1.4
260	Paper and Allied Products	2	2.7
262	Paper Mills	5	6.7
265	Paperboard Containers and Boxes	1	1.4
267	Misc. Converted Paper Products	3	4.1
301	Tires and Inner Tubes	2	2.7
302	Rubber and Plastics Footwear	3	4.0
305	Hose & Belting & Gaskets & Packing	1	1.4
306	Fabricated Rubber Products, NEC	1	1.4
308	Misc. Plastics Products	5	6.7
331	Blast Furnace and Basic Steel Products	4	5.4
356	General Industrial Machinery and Equip.	11	14.9
371	Motor Vehicles and Equipment	23	31.1
399	Misc. Manufacturing Industries	3	4.0
541	Grocery Stores	6	8.0
	Total	74	100%

For the empirical tests of descriptive statistics and conservatism, the pre-SOX sample period spans three years starting from 1998 fiscal year and ending in 2000 fiscal year, which are matched with the post-SOX sample period that runs from 2002 through 2004 fiscal years. Since the Enron accounting scandal that directly motivated the enactment of SOX took place in 2001, the year was omitted in the pre-SOX sample period determination because of the potential to confound empirical results.[16]

Table 1-A provides the sample selection process. Our sample of high-tech firms (HT) combines high-tech firms from Francis and Schipper (1999) and those listed on the CNNFN.COM (as of July 20, 2000) website. As in Francis and Schipper (1999), we define high-tech firms as those in the computer, electronics, pharmaceutical, and telecommunications industries. We supplement our sample with an additional 22 high-tech firms listed on CNNFN.COM, one of the most popular Internet sites for business news. These procedures result in an initial sample of 2,728 high-tech firms. After eliminating firms with missing observations in return data, forecast data, financial data, and 10-Q dates from the SEC's EDGAR database, we obtain the final high-tech sample that comprises 365 firms. For our sample of low-tech firms (LT), the initial 984 low-tech companies selected are similar to those in Francis and Schipper (1999). Excluding missing observations, we secure a final sample of low-tech firms that consists of 74 firms.[17]

Table 1-B presents the distribution of our sample in each industry measured by three-digit SIC codes. Computer and data processing services, electronic components and accessories, drugs, and computer and office equipment industries represent 80% of high-tech firms. The two most conspicuous industries (more than 46%) in the low-tech sample include motor vehicles & equipment and general industrial machinery & equipment.

Table 2 provides means and medians of financial variables, some forecast related variable (i.e., number of analysts), and results of tests of differences between the pre-SOX period (1998-2000) and the post-SOX period (2002-2004) for both high-tech and low-tech firms. As we expect, the size of operation, measured by net sales deflated by total assets, and market-to-book value of assets (a proxy for a firm's investment opportunities) were significantly lower for both high-tech and low-tech firms in the post-SOX period. High-tech firms attracted more financial analysts and incurred more selling, general, and administrative expenses per unit of assets whereas low-tech firms experienced the opposite with respect to these variables in the post-SOX period.

Table 3 shows the distribution of 10-Q filing days in both pre-SOX and post-Sox periods for high-tech and low-tech firms. In the quarter right before SOX in 2002, the highest (lowest) frequency for Form 10-Q filing occurred on Wednesday (Thursday) for high-tech firms whereas the highest (lowest) frequency for Form 10-Q filing took place on Tuesday (Friday) for low-tech firms. For the second quarter following SOX, the highest (lowest) frequency for Form 10-Q filing occurred on Tuesday (Monday) for high-tech firms whereas the highest (lowest) frequency for Form 10-Q filing took place on Tuesday (Monday) for low-tech firms.

Figures 1A (1B) concerns the distribution of Form 10-Q filings per day for high-tech (low-tech) firms. As shown in the figures, the highest frequency in the pre-SOX (post-SOX) quarter occurred on May 15 (November 14) for both high-tech and low-tech firms.

[16] On analysis that observations from 2001 are excluded, we repeated our tests with the year in question and the interpretation is qualitatively unchanged.

[17] Our definitions of high- and low-tech firms are also consistent with those in Kwon (2002) and Kwon and Yin (2006).

Table 2. Descriptive Statistics

Constant Sample[a]

Variable[a]	1998-2000 Mean	1998-2000 Median	2002-2004 Mean	2002-2004 Median	Matched-Pair Student's t	Wilcoxon Signed-Rank Z
Size of Operation (SIZE)						
HT	0.9726	0.9880	0.8433	0.7285	4.57***	4.19***
LT	1.1771	0.9300	1.0839	0.8270	2.23**	3.17***
Research and Development Expenses deflated by Assets (RNDA)						
HT	0.0634	0.0520	0.0585	0.0450	1.53	1.74*
LT	0.0134	0.0050	0.0116	0.0030	1.23	1.34
Selling, General, and Administrative Expenses deflated by Net Sales (SGAS)						
HT	0.3144	0.2980	0.3415	0.3385	-3.23***	-2.39**
LT	0.1439	0.1080	0.1354	0.1060	2.04**	1.55
Special Items deflated by Net Sales(SPECS)						
HT	-0.0101	0.0000	-0.0201	-0.0020	1.48	1.03
LT	-0.0048	0.0000	-0.0044	0.0000	-0.22	0.36
Debt-to-Total Assets (DEBTA)						
HT	0.1524	0.1130	0.1328	0.1345	1.04	0.89
LT	0.3115	0.2370	0.2738	0.2560	1.12	0.10
Market-to-Book Value of Assets (MTBA)						
HT	5.1573	3.7370	2.4596	2.2505	5.55***	5.63***
LT	2.2789	1.9970	1.9698	1.5290	2.23**	2.64***
Number of Analysts (NOA)						
HT	13.8531	11.0000	15.5305	13.0000	-3.96***	-3.95***
LT	10.3333	9.0000	9.5028	10.0000	2.89***	2.66***

[a] The definitions of these variables are given below with annual COMPUSTAT items in parentheses:
SIZE = nsales (12) / total assets (6);
RNDA = Research and Development expenses (46) divided by total assets (6);
SGAS = selling, general, and administration expenses (189) divided by net sales (12);
SPECS = special items (17) divided by net sales (12);
DEBTA = long-term debt plus the current portion of long-term debt (9 + 34) divided by total assets (6),
MTBA = Market-to-Book value of assets= market value of total assets (6 – 60 + 199 * 25) divided by book value of total assets (6); and
NOA = Number of Analysts (NOA) from the IBES file who provided earnings per share forecast data for HT(LT) firms.

T-tests are performed between two sample periods – 1998-2000 and 2002-2004 periods. The symbols of *, **, and *** indicate statistical significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

Figure 1B. Distribution of Form 10-Q Filings Per Day for Low-Tech Firms

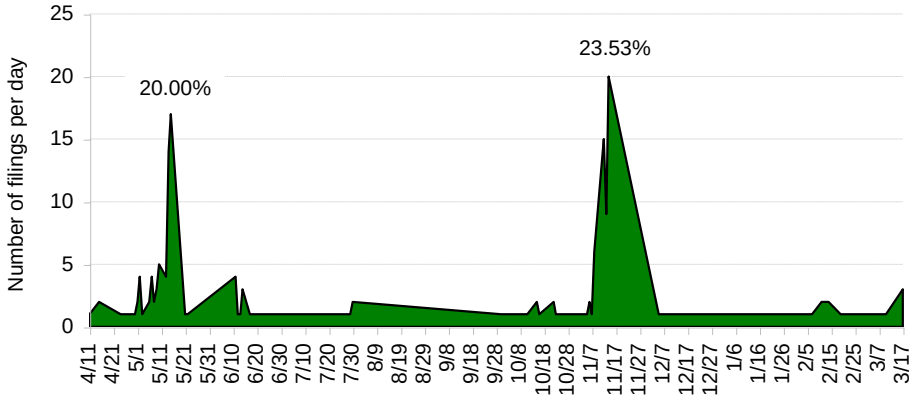


Figure 1A. Distribution of Form 10-Q Filings Per Day for High-Tech Firms

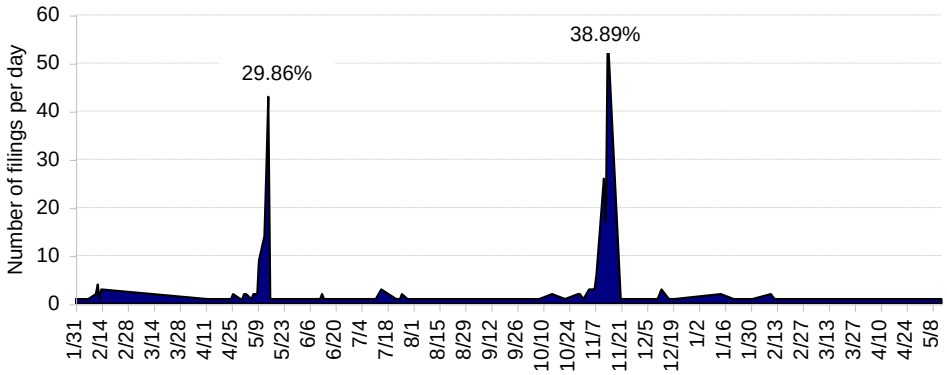


Table 3. 10-Q Filing Days in the SOX year for HT and LT Firms

Panel A: HT firms				
Period		**Pre-SOX**	**Post-Sox**	**Total**
Number of Filings				
Total	All	144	144	288
Weekday	Mon	23	5	28
	Tue	38	38	76
	Wed	48	27	75
	Thu	15	61	76
	Fri	20	13	33

Panel B: LT firms				
Period		**Pre-SOX**	**Post-Sox**	**Total**
Number of Filings				
Total	All	85	85	170
Weekday	Mon	11	7	18
	Tue	28	24	52
	Wed	25	17	42
	Thu	11	25	36
	Fri	10	12	22

3.2 Research Design

The metrics of this paper are developed to test the informedness and consensus of accounting information. Therefore, both price and volume variability metrics are constructed. We use three price variability metrics (Patell 1976, Beaver 1968, and McNichol and Manegold 1983) and two trading volume metrics to measure market reactions.[18,19]

3.2.1 Price Variability Metrics

Metrics for cumulative variance of returns are computed as follows:

[18] Scholes and Williams (1977) suggest that the econometric problem of errors-in-variables may exist due to non-synchronous measurement of returns of a security relative to a market index when calculating residuals in the announcement period using the market model proposed by Sharpe (1964). This can be particularly troublesome for firms that trade less frequently than a market index. Brown and Warner (1980) demonstrate that the efficacy of the mean-adjusted-returns approach in detecting abnormal performance is no less than that of the market and risk-adjusted-return approach.

[19] The volume metrics adopted in this paper are conceptually similar to the price variability measure used in McNichol and Manegold (1983). They are all mean-adjusted measures. Similar to the case with price variability measures, mean-adjusted volume metrics, instead of risk-adjusted metrics, are used to avoid the errors-in-variables problem that may arise from nonsynchronous measurement of trading volume relative to a volume index when calculating residuals in the announcement period using the market model (Beaver 1968). However, the definition of relative trading volume is consistent with Beaver's (1968, p. 73) definition of his volume metric.

Patell's (1976) CVR

$$\text{Patell's CVR}i,L = \frac{1}{L}\sum_{K=1}^{L}\{[u2i,k\ (Ti-4)]/[S2i\ Ci,k\ (Ti-2)]\} \quad (1)$$

$u_{i,k} = R_{i,k} - (\alpha_i + \beta_i R_{M,k})$ where $R_{i,}k$ is the daily stock return for firm i on day k, and $R_{M,k}$ is the return on an equally weighted market portfolio for day k. The model's parameters, α_i and β_i, are derived from firm-specific regressions using past returns, where the estimation period extends from day {-130} to day {-11] (i.e., 120 daily returns), and day {0} is the filing date of Form 10-Q. S_i is the standard deviation of the residuals during the estimation period. $C_{i,k}$ is the increase in the variance due to prediction outside the estimation period (see Patell 1976). The market model is estimated separately for each year of every firm.

Beaver's (1968) CVR

$$\text{Beaver's CVR}i,L = \frac{1}{L}\sum_{K=1}^{L}(u2i,k\ /S2i\ ) \quad (2)$$

$u_{i,k} = R_{i,k} - (\alpha_i + \beta_i R_{M,k})$ where $R_{i,}k$ is the daily stock return for firm i on day k, and $R_{M,k}$ is the return for an equally weighted market portfolio for day k. The model's parameters, α_i and β_i, are derived from firm-specific regressions using past returns, where the estimation period extens from day {-130} to day {-11] (i.e., 120 daily returns), and day {0} is the filing date of Form 10-Q. S_i is the standard deviation of the residuals during the estimation period. The market model is estimated separately for each year of every firm.

McNichols and Manegold's (1983) CVR

$$\text{Mean} - \text{Adjusted CVR}i,L = \frac{1}{L}\sum_{K=1}^{L}(u2i,k\ /S2i\ ) \quad (3)$$

where
$u_{i,k} = R_{i,k} - M_i$;
$u_{i,k}$ = the announcement-period abnormal returns or prediction errors;
S_i = the standard deviation of the returns during the estimation period; and
M_i = the mean return during the estimation period.

3.2.2 Volume Analysis

Holthausen and Verrecchia (1990) observe that the variance of security price is a more informative characterization than the mean of security price for measuring informedness and consensus because price effects can be positive or negative. However, trading volume results from the absolute value of net demand. Therefore, expected trading volume , instead of the variance of trading volume, is sufficient for understanding how trading volume behaves when informedness and consensus shift.

Since both trading volume and trading volume variability measure abnormal levels of investor reaction to a signal in accounting information, we conduct our analyses using both metrics to enhance the generalizability of trading volume results.

CAVOL

A cumulative abnormal volume metric (CAVOL) is computed as follows

$$\text{CAVOL}i,L = \frac{1}{L}\sum_{K=1}^{L}\text{MADJVOL}i,k \quad (4)$$

where
$MADJVOL_{i,k} = V_{i,k} - MVOL_i$;
$MADJVOL_{i,k}$ = the announcement-period mean-adjusted relative volume;
$V_{i,k}$ = relative volume or
trading volume / shares outstanding, for firm i in day k; and
$MVOL_i$ = the mean relative volume during the estimation period.

The estimation period extends from day {-130} to day {-11] (i.e., 120 daily volumes), and day {0} is the filing date of Form 10-Q.

CVRVOL

A cumulative variance of volume metric (CVRVOL), similar to a mean-adjusted CVR, is computed as follows:

$$CVRVOLi,L = \frac{1}{L}\sum_{K=1}^{L}(vol2i,k \ / \ SVOL2i \ ) \quad (5)$$

where
$vol_{i,k}$ = $V_{i,k}$ - $MVOL_i$;
$V_{i,k}$ = relative volume or
trading volume / shares outstanding, for firm i in day k;
$vol_{i,k}$ = the announcement-period abnormal relative volume;
$SVOL_i$ = the standard deviation of relative volume during the estimation period; and
$MVOL_i$ = the mean relative volume during the estimation period.

The estimation period extends from day {-130} to day {-11] (i.e., 120 daily volume data), and day {0} is the filing date of Form 10-Q.

3.2.3 Multivariate Regression Model

This section concerns the following pooled time-series, cross-sectional multiple regression model based on Griffin (2003):

CVRi,t or CAVOLi,t = β0 + β1 INi,t + β2 INDi,t + β3 QDUMi,t + β4 QDUMDi,t + β5 WKi,t + β6 WKDi,t + β7 LMVi,t + β8 LMVDi,t + β9 IHi,t + β10 IHDi,t + β11 AAi,t + β12 AADi,t + εi,t (6)

The dependent variable is either Patell's cumulative variance of returns, mean-adjusted cumulative variance of returns, or cumulative abnormal volume measured over the investor response period for firm i at a short event window t, namely, over three [0, +2] days starting from the Form 10-Q filing date [day 0].[20] As in Griffin (2003), the following independent variables are adopted: information intensity, IN, takes 1 when 100 or more form 10-Q filings per day and 0 otherwise; IND = IN * HT, where HT = 1 if the firm belongs to the high-tech sample, HT = 0 otherwise. The quarterly dummy variable (QDUM) takes 1 if the quarter is the first quarter in 2003 following SOX and 0 if the quarter is the one prior to SOX; QDUMD = QDUM * HT. Midweek filing, $WK_{i,t}$, takes 1 if the day is either Monday or Friday and 0 otherwise; WKD = WK * HT. A logarithm of market capitalization (LMV) that is a proxy for firm size or the amount of other information releases for the preannouncement period; LMVD = LMV * HT. Institutional holdings (IH) measured as percentage of shares held by institutions deflated by 100; IHD = IH * HT. Accounting accruals (AA) measured as net income from continuing operations less operating cash flow deflated by shareholders' equity; AAD = AA * HT.[21]

The sign of the information intensity variable (IN) is expected to be positive due to industry effects around the filing date when high frequency (e.g., more than 100 per day) of filing takes place. The sign of the quarterly dummy variable (QDUM) is expected to be negative for high-tech firms if this paper's first hypothesis that stock price variability is lower for high-tech firms in the post-SOX period than in the pre-SOX period during quarterly reporting is sustainable. The sign of the midweek filing variable is predicted to be positive because the information arrives more as a surprise if filings are made at the beginning or end of a week (Gibbons and Hess, 1981; Griffin, 2003). As in Griffin (2004), the sign of the institutional holdings variable (IH) is expected to be negative because the response of institutional investors vis-à-vis non-institutional investors is likely to be less sensitive (due to the size of ownership and

[20] Asthana and Balsam (2001) reported a significant investor response to an EDGAR 10-K filing prior to the actual filing date. They used a five-day event window [-1, 3]. Griffin (2003) documents that the absolute value of excess return is reliably greater on the day of and on one or two days [0, +2] immediately following either 10-K or 10-Q filing date, which is precisely when one would expect it assuming no leakage or violation of EDGAR filing procedures. We also use different event windows such as [-1,+1] and [-1,0] and find qualitatively similar results.

[21] According to Griffin (2003), there are two more information environment variables that could affect unexpected stock price response at the announcement of 10-K or 10-Q reports, but were excluded in this study: Form NT filing (NT) and Industry Composition (IC). There were no NT filings (i.e., the form 10-Q filing made after the due date which is 45th date from the fiscal quarter end) observed in both high-tech and low-tech samples. There were no changes in the composition and the number of firms for both high-tech and low-tech firms during the sample period. We obtain qualitatively similar results (not reported) when we use an alternative post-SOX period, which consists of a three-day event window starting at the Form 10-Q filing date for the quarter in 2002 after SOX.

other constraints indigenous to each institution) to the disclosure of new accounting information. Prior research such as Atiase (1985), Bamber (1987), Freeman (1987), and others has documented that smaller firms respond more strongly than larger firms on earnings announcement dates. Accordingly, the expected sign of the market capitalization variable (IMC) is negative. As Griffin (2003) argues, investors might respond more strongly to firms with extreme accruals. Therefore, we predict a positive sign for the accounting accruals variable (AA).

3.2.4 Conservatism as continuous recognition of more bad news than good news

Givoly and Hayn (2000) recognize that conservatism directly affects the magnitude of earnings.[22] Following Stickney and Weil (2000, 875), they define conservatism as "a selection of accounting principles that lead to the minimization of cumulative reported earnings." In a steady state, the cumulative amount of net income is expected to converge in the long run to cash flow from operations. If cumulative accruals, as the aggregate difference between net income and cash flows over time do not sum to zero and are negative, it indicates that aggregate cumulative net income is consistently lower than the aggregate cumulative cash flow from operations, an indication of conservatism. Cumulative rather than yearly accruals are used to measure conservatism because of the nature of accruals: periods in which net income exceeds (falls below) cash flows from operations are expected to be followed by periods with negative (positive) accruals.

Total accruals consist of operating (working capital) accruals and non-operating accruals. Operating accruals arise from the basic day-to-day business of a firm, including changes in accounts receivables, inventory, prepaid expenses, accounts payables, and tax payables. Non-operating accruals, on the other hand, include items such as loss and bad debt provisions, restructuring charges, the effect of changes in estimates, gains and losses on the sale of assets, asset write-downs, the accrual and capitalization of expenses and the deferral of revenues and their subsequent recognition (Givoly and Hayn 2000). Items included in non-operating accruals are largely subject to management discretion and, thus, a more accurate measure for conservatism.

Consistent with Givoly and Hayn (2000), non-operating accruals are calculated as follow:

Total accruals (before depreciation) = (net income + depreciation) – cash flow from operations
Operating accruals = ΔAccounts Receivable + ΔInventories + ΔPrepaid Expenses – ΔAccounts Payable - ΔTax Payable
Non-operating accruals = Total accruals (before depreciation) – operating accruals (7)

A direct comparison of the magnitude of the cumulative accruals is not appropriate because of the difference in size between high-tech and low-tech firms.[23] We thus deflate accruals alternatively by assets and sales. If conservative accounting practices tend to minimize accounting earnings, then conservative firms would be more likely to have higher levels of negative (or lower levels of positive) cumulative non-operating accruals over time than other firms.

3.2.5 Discretionary Accruals

Modified Jones Model

We compute discretionary accruals using the cross-sectional modified Jones model estimated by industry and year. The cross-sectional approach has the advantage of controlling for the effects of industry-wide economic changes on total accruals and allowing the coefficients to change across years due to possible structural changes.[24] For every year t from 1998 to 2004, the following model is estimated:

$$TACCR_{i,t} / A_{i,t-1} = a_t (1/A_{i,t-1}) + b_{1t} (\Delta REV_{i,t} - \Delta REC_{i,t}) / A_{i,t-1} + b_{2t} (PPE_{i,t} / A_{i,t-1}) + \epsilon_{i,t} \quad (8)$$

where, for firm i at time t,
$TACCR_{i,t}$ = total accruals, see footnote[25];

[22] Since there has not been a consensus on the definition of conservatism in accounting literature, multiple measures of conservatism can be used. Lobo and Zhou (2006) used the Basu (1997) measure of conservatism and discretionary accruals. The non-operating accruals measure of conservatism was adopted by Givoly and Hayn (2000), and Kwon, Yin, and Han (2006).

[23] Kwon, Yin, and Han (2006) report that the average total assets and sales of LTC are approximately four times greater than those for HTC in the 1990s. The average total assets (sales) of LTC is $3,706.88 million ($3,269.5 million), compared with $926.9 million ($844.59 million) for HTC.

[24] Guay, Kothari, and Watts [1996] investigate the relative merit of various discretionary accrual models and conclude that the cross-sectional Jones and cross-sectional modified Jones models are most the effective in identifying discretionary accruals. DeFond and Jiambalvo [1994], Subramanyam [1996], Bartov, Gul, and Tsui [2000], and Gul, Leung, and Srinidhi [2000] further support the adoption of the cross-sectional modified Jones model.

[25] $TACCR_{i,t} = \square CA_{i,t} - \square CL_{i,t} - \square Cash_{i,t} + \square STD_{i,t} - Dep_{i,t}$, where, for firm i at time t, $\square CA_{i,t}$= change in current assets (item #4); $\square CL_{i,t}$ = change in current liabilities (item #5); $\square Cash_{i,t}$ = change in cash and cash equivalents (item #1); $\square STD_{i,t}$ = change in debt included in current liabilities (item #34); and $Dep_{i,t}$ = depreciation and amortization expense (item #14).

$A_{i,t-1}$ = lagged total assets (item #6);
$\Delta REV_{i,t}$ = change in sales (item #12);
$\Delta REC_{i,t}$ = change in accounts receivable (item #2);
$PPE_{i,t}$ = gross property, plant and equipment (item #7); and
$\epsilon_{i,t}$ = error term.

Discretionary accruals are estimated as the difference between reported total accruals and fitted values of total accruals (nondiscretionary accruals) using coefficient estimates from equation (8) for the years 1998-2004:

$$DA_{i,t} = TACCR_{i,t}/A_{i,t-1} - [a_t (1/A_{i,t-1}) + b_{1t} (\Delta REV_{i,t} - \Delta REC_{i,t}) / A_{i,t-1} + b_{2t} (PPE_{i,t} / A_{i,t-1})] \quad (9)$$

where $DA_{i,t}$ is discretionary accruals and $\Delta REC_{i,t}$ is the change in accounts receivable (item #2).

Performance-Matched Discretionary Accruals

We adjust discretionary accruals for performance and industry effects as suggested in Kothari, Leone, and Wasley (2005) because potential measurement errors in discretionary accruals may correlate with industry membership, growth, or performance. We calculate performance-matched discretionary accruals for firm i as discretionary accruals of firm i minus discretionary accruals of firm j that exhibits the closest ROA in the same industry.

3.2.6 Basu's Conservatism Metric

To gain further evidence of the change in conservatism for our sample firms pre- and post-SOX, we use the Basu (1997) measure to investigate how firms incorporate good news and bad news into earnings. We reckon that conservatism has increased if firms incorporate bad news even faster or good news even slower post-SOX. We test this hypothesis both within each high-tech and low-tech sample and also between them by the following regression model:

$$\begin{aligned} Earnings = {} & \alpha_0+\alpha_1*Post_{it}+\alpha_2*HTC_{it}+\alpha_3*HTC_{it}*Post_{it} \\ & +\beta_0*D_{it}+\beta_1*Post_{it}*D_{it}+ \\ & \beta_2*HTC_{it}*D_{it}+\beta_3*HTC_{it}*Post_{it}*D_{it}+ \\ & \gamma_0*Return_{it}+\gamma_1*Post_{it}*Return_{it}+\gamma_2*HTC_{it}*Return_{it}+\gamma_3* \\ & HTC_{it}*Post_{it}*Return_{it} \\ & +\phi_0*D_{it}*Return_{it}+\phi_1*Post_{it}*D_{it}*Return_{it}+\phi_2*HTC_{it}*D_{it} \\ & *Return_{it}+\phi_3*HTC_{it}*Post_{it}*D_{it}*Return_{it}+\varepsilon_{it} \quad (10) \end{aligned}$$

where, for firm i at time t:
Post =1 if the observation belongs to 2002, 2003, and 2004 fiscal years and 0 if it belongs to 1998, 1999, and 2000 fiscal years;
Earnings = the earnings per share for firm i in fiscal year t, deflated by the stock price per share at the beginning of the fiscal year.
D=1 if stock return is negative and 0 otherwise
Return = 12 month stock return for the fiscal year
HTC =1 if the firm is a high-tech firm and 0 otherwise

To investigate whether high-tech firms' rate of incorporating bad news into earnings is *faster* post-SOX, the coefficient of interest is $\gamma_1+\gamma_3+\phi_1+\phi_3$ (Post*Return+HTC*Post*Return+Post*D*Return+HTC*Post*D*Return) and is expected to be positive; to investigate whether the change in rate of incorporating good news into earnings is *slower* post-SOX, the coefficient of interest is $\gamma_1+\gamma_3$ (Post*Return+HTC*Post*Return) and is expected to be insignificant or near zero. For low-tech firms, to examine whether the rate of incorporating bad news into earnings is *faster* post-SOX, the coefficient of interest is $\gamma_1+\phi_1$ (Post*Return + Post*D*Return) and is expected to be positive; to examine the change in rate of incorporating good news into earnings is *slower* post-SOX, the coefficient of interest is γ_1(Post*Return) and is expected to be insignificant or near zero. Finally, to investigate post-SOX whether high-tech firms' *change* of rate of incorporating bad news into earnings is larger than low-tech firms, the coefficient of interest is $\gamma_3+\phi_3$ (HTC*Post*Return+HTC*Post*D*Return) and is expected to be positive; and for the good news test, the coefficient of interest is γ_3 (HTC*Post*Return) and is expected to be negative.

4. Empirical Results

4.1 Informedness and Consensus Analysis

In Table 4, we examine whether informedness and consensus have changed as a result of first-time internal control disclosures mandated by Section 302 of SOX through Form 10-Q reports around SOX. Three different price variability metrics from prior studies – Patell's CVR, Beaver's CVR, and Mean-Adjusted CVR - are adopted to measure investors' informedness and consensus at the time of SOX disclosures. Informedness is proxied by abnormal stock return variances and abnormal trading volume as in Beaver (1968) whereas consensus is measured as abnormal stock return variances, abnormal trading volume, and forecast dispersion.

The analyses based upon comparisons of CVRs three years prior to and following the enactment of SOX legislation would suffer potential confounding event problems arising from required disclosures under other statements of financial accounting standards such as SFAS 138-150.[26] Therefore, we

[26]The following significant statements of financial accounting standards (SFASs) were issued during the sample

examine the informedness and consensus issues more closely using quarterly data in Table 4. We compare stock return variances at the announcement date of a quarterly report that is issued in the last quarter prior to the SOX enactment date (July 30, 2002) with stock return variances at the announcement date of a quarterly report that is issued in the second quarter of 2002 or the first quarter of 2003 following the Act.[27] Consistent with the results of investor response to Form 10-K and Form 10-Q EDGAR filings demonstrated in Griffin (2003), we adopt a three-day window starting from a filing date, day(0), which is denoted as [0, +2] in the tables to follow.[28]

Univariate Analysis

As shown in Panels A & B of Table 4, stock return variances for high-tech firms decreased very significantly in both post-SOX periods. The comparisons of all measures of price variability reveal 1% significance levels in both two-tailed parametric and non-parametric tests. The results of Panels A & B in Table 4 strongly suggest that stock price variability is lower for high-tech firms during the disclosure of accounting information after the Sarbanes-Oxley Act, supporting H1.

Panel C of Table 4 indirectly tests whether or not forecast consensus of market agents improved after SOX. The annual earnings forecast dispersion measured at the first fiscal-year-end month after SOX is compared with that measured at the last fiscal-year-end month before SOX. Monthly forecast data in measuring forecast dispersion are used due to limited or unavailable daily forecast figures. The results of Panel C show some evidence of decreased forecast dispersion for both high-tech and low-tech firms in the post-SOX period. In other words, security analysts' forecast consensus increased following the Act. Specifically, matched-pair student's t-statistics are 1.66 (1.85) for high-tech (low-tech) firms, which are significant at 10% levels in two-tailed tests.

There is a caveat, however, in relating the above evidence of an increase in analysts' consensus of annual earnings forecasts to the Holthausen and Verrecchia's (1990) consensus effect at the time of accounting disclosures. The former compares analysts' earnings forecast consensus between preselected pre- and post-SOX periods before the actual annual earnings announcement is made. In contrast to analysts' earnings forecast consensus, the latter focuses on investors' consensus of opinions and actions at the time of accounting disclosure (Form 10-Q). To the extent that earnings numbers can fully reflect investors' informedness and consensus at the time of accounting disclosure in both pre-SOX and post-SOX periods, and financial analysts can fairly represent general investors' opinions, those two consensus concepts (ex ante and ex post) may converge on the same effect.

period: SFAS 138 (Accounting for Certain Derivative Instruments and Certain Hedging Activities, June 2000); SFAS 140: Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities, September 2000); SFAS 141 (Business Combinations, June 2001),; SFAS 142 (Goodwill and Other Intangible Assets, June 2001); SFAS 143 (Accounting for Asset Retirement Obligations, June 2001); SFAS 144 (Accounting for the Impairment of Disposal of Long-Lived Assets, August 2001); SFAS 146 (Accounting for Costs Associated with Exit or Disposal Activities, June 2002); SFAS 148 (Accounting for Stock-Based Compensation – Transaction and Disclosure, December 2002); SFAS 149 (Amendment of Statement 133 on Derivative Instruments and Hedging Activities, April 2003); and SFAS 150 (Accounting for Certain Financial Instruments with Characteristics of both Liabilities and Equity, May 2003).

[27] Normally, firms started to report internal control related disclosures (Section 302 of SOX) in the second quarterly report after the SOX enactment date. However, to alleviate concerns related to the exact timing of initial internal control effectiveness disclosures (Ashbaugh-Skaife, 2008), we also include the results from 10-Q filing dates for the first quarter in 2003. If some of high-tech and low-tech firms made disclosures of internal control weaknesses, any market reactions to the overall information presented in the 10-Q report might be attributable to internal control problems of such firms, not to the overall information in the 10-Q report. The control for the above competing hypothesis by restricting the sample firms to no internal control deficiency firms is important because both mechanisms occur concurrently around the 10-Q reporting dates.

[28] Griffin (2003) documents that the absolute value of excess return, similar to this paper's Mean-Adjusted CVR, is reliably greater on the day of and on the one or two days immediately following the filing date.

Table 4. Stock Return Variability (CVR) at Quarterly Report Disclosure Dates around the SOX Three-Day Event Window [0, +2][a]

	CVR				Matched-Pair	Wilcoxon
	Pre-SOX		Post-Sox		Student's	Signed-Rank
Variable	Mean	Median	Mean	Median	t	Z
Panel A: Last Quarter before SOX vs. Second Quarter in 2002 after SOX						
Patell's CVR						
HT	1.2301	0.6485	0.7276	0.4166	2.84***	3.74***
LT	1.1208	0.4443	0.8990	0.4091	0.68	0.74
Beaver's CVR						
HT	1.2746	0.6746	0.7516	0.4296	2.86***	3.78***
LT	1.1606	0.4562	0.9307	0.4223	0.67	0.73
Mean-Adjusted CVR						
HT	1.3748	0.7727	0.7461	0.4685	3.83***	3.88***
LT	1.1756	0.5041	1.1187	0.5514	0.19	-0.01
Panel B: Last Quarter before SOX vs. First Quarter in 2003 after SOX[b]						
	CVR				Matched-Pair	Wilcoxon
	Pre-SOX		Post-Sox		Student's	Signed-Rank
Variable	Mean	Median	Mean	Median	t	Z
Patell's CVR						
HT	1.2412	0.6485	0.7708	0.4942	2.77***	2.73***
LT	0.8983	0.4400	0.7670	0.4384	0.76	-0.46
Beaver's CVR						
HT	1.2861	0.6746	0.7951	0.5083	2.81***	2.76***
LT	0.9299	0.4546	0.7908	0.4551	0.78	-0.44
Mean-Adjusted CVR						
HT	1.3885	0.7885	0.6268	0.3893	4.55***	4.93***
LT	1.0067	0.5030	0.6302	0.3977	2.28**	1.86*
Panel C: Forecast Dispersion[c]						
HT	0.0277	0.0160	0.0214	0.0160	1.66*	0.68
LT	0.0376	0.0190	0.0248	0.0170	1.85*	1.56

[a] A cumulative variance of returns [**Patell's (1976) CVR**] metric is computed as follows

$$CVR_{i,L} = 1/L \sum_{K=1}^{L} \{[u^2_{i,k} (Ti - 4)] / [S^2_i C_{i,k} (Ti - 2)]\}$$

$u_{i,k} = R_{i,k} - (\alpha_i + \beta_i R_{M,k})$ where $R_i k$ is the daily stock return for firm i on day k, and $R_{M,k}$ is the return on an equally weighted market portfolio for day k. The model's parameters, α_i and β_i, are derived from firm-specific regressions using past returns, where the estimation period extens from day {-130} to day {-11] (i.e., 120 daily returns), and day {0} is the filing date of Form 10-Q. The market model is estimated separately for each quarter of every firm. Beaver's (1968) CVR and McNichols and Manegold's (1983) mean-adjusted CVR are also calculated for the comparison purpose, and their detailed descriptions are provided in the methodology section. The symbols of *, **, and *** indicate statistical significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

[b] Two high-tech (low-tech) firms whose cusip numbers are 11162110 and 53222610 (12612W10 and 90212410) are lost due to missing returns data in this analysis, reducing the sample size to 142 (83) for high-tech (low-tech) firms.

[c] Forecast dispersion (FD) is measured as follows:

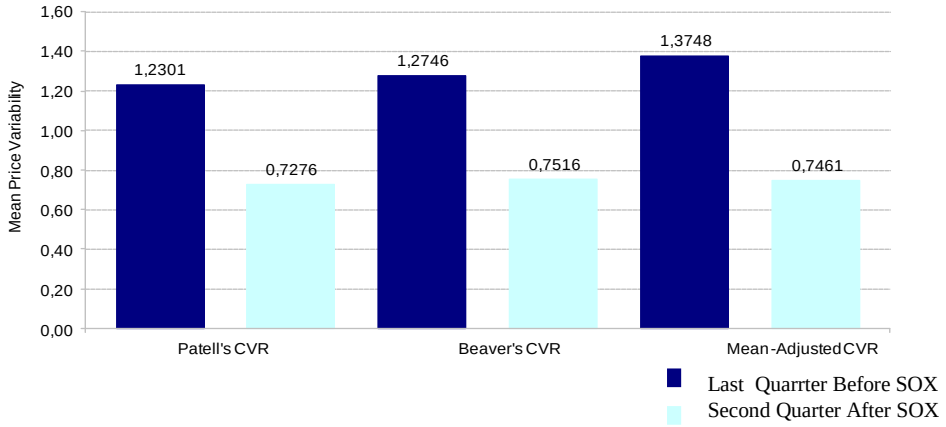
$FD_{it} = |SD_{it} / FEPS_{it}|$ Where SD_{it} = standard deviation of financial analysts' forecasts for firm i in year t (the number of analysts ≥ 3). $FEPS_{it}$ = mean financial analysts' earnings forecast for *current year* made in the fiscal–year-end month for firm i. Fiscal years 2001 and 2002 were compared.

Figure 2 shows graphic presentations of the data related to Patell's, Beaver's and Mean-Adjusted CVRs for both pre- and post-SOX quarters, which are tabulated in Panel A (Three-Day Window) of Table 4. Indeed, a significant decrease in stock return variability for high-tech firms relative to low-tech firms is clearly demonstrated for both mean and median price variability cases.

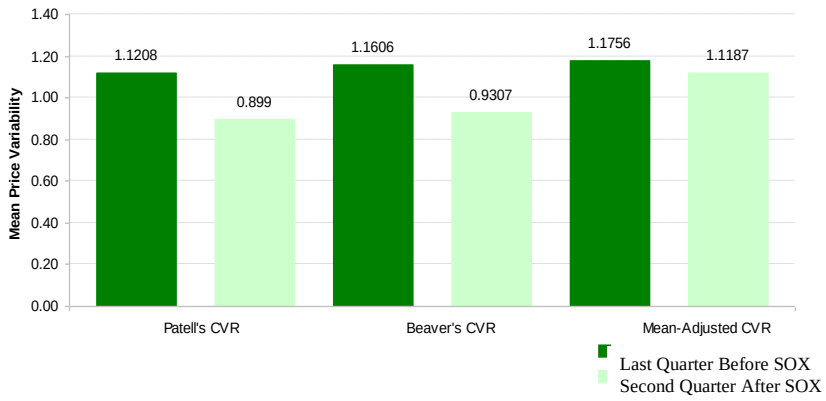
Figure 2. Comparison of Mean and Median Price Variability between Pre- and Post- SOX[29]

Panel A: Mean Price Variability [0, +2]

HT Firms



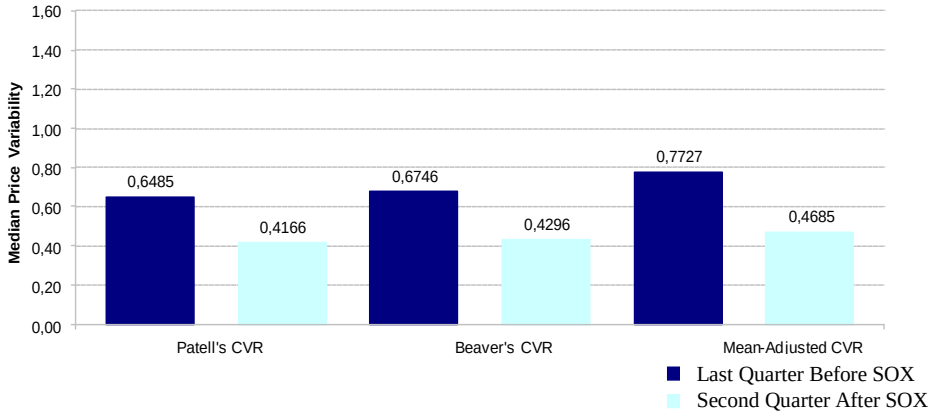
LT Firms



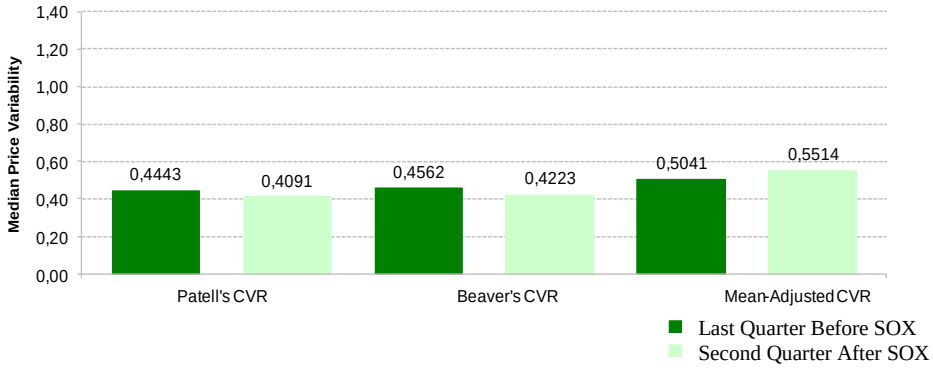
[29] Applied to three-day event window

Panel B: Median Price Variability [0, +2]

HT Firms



LT Firms



The analyses of trading volume (CAVOL) and trading volume variability (CVRVOL) reported in Table 5 reveal evidence of decreased abnormal trading volume at the announcement of second quarterly reports in 2002 (Panel A) or first quarterly reports in 2003 (Panel B) after the enactment of SOX for both high-tech and low-tech firms. First, the results of CAVOL, in Panel A of Table 5 show that in high-tech (low-tech) industries, the non-parametric Wilcoxon Z statistic for a three-day event window is 1.79 (1.65), which is statistically significant at the 10% level in two-tailed tests. For the volume metric of CVRVOL, high-tech industries, non-parametric Wilcoxon Z statistic is 2.27 for a three-day window, which is significant at the 5% level in two-tailed tests.

Second, the evidence of decreased abnormal trading volume in Panel B is also qualitatively consistent with that revealed in Panel A of Table 5. Specifically, in high-tech (low-tech) industries, the non-parametric Wilcoxon Z (the matched-pair student's t) statistic for a three-day event window is 2.21 (1.84) when the trading volume is measured as CAVOL (CVRVOL), which is statistically significant at the 5% (10%) levels in two-tailed tests. The results of Tables 5 are overall consistent with the prediction that trading volume is lower for both high-tech and low-tech firms during the disclosure of internal control effectiveness after the Sarbanes-Oxley Act, supporting H2.

Table 5. Trading Volume (VOL) at Quarterly Report Disclosure Dates around the SOX Three-Day Event Window [0, +2] [a]

Panel A: Last Quarter before SOX vs. Second Quarter in 2002 after SOX						
	VOL				Matched-Pair	Wilcoxon
	Pre-SOX		Post-Sox		Student's	Signed-Rank
Variable	Mean	Median	Mean	Median	t	Z
CAVOL						
HT	-0.0005	-0.0002	-0.0012	-0.0009	0.80	1.65*
LT	0.0002	-0.0004	-0.0008	-0.0010	1.24	1.79*
CVRVOL						
HT	1.0551	0.3293	0.7327		0.2564	0.86
2.27***						
LT	1.4263	0.2864	0.8055	0.3086	1.33	0.44

Panel B: Last Quarter before SOX vs. First Quarter in 2003 after SOX[b]						
	VOL				Matched-Pair	Wilcoxon
	Pre-SOX		Post-Sox		Student's	Signed-Rank
Variable	Mean	Median	Mean	Median	t	Z
CAVOL						
HT	0.0003	-0.0002	-0.0007	-0.0007	1.02	2.21**
LT	-0.0001	-0.0002	-0.0003	-0.0005	0.59	0.68
CVRVOL						
HT	1.8601	0.3433	1.2307	0.3797	0.69	0.26
LT	1.4139	0.2824	0.6551	0.3231	1.84*	1.24

[a] A cumulative abnormal volume metric (CAVOL) is computed as follows:

$$CAVOL_{i,L} = 1/L \sum_{K=1}^{L} MADJVOL_{i,k}$$

where
$MADJVOL_{i,k} = V_{i,k} - MVOL_i$; $MADJVOL_{i,k}$ = the announcement-period mean-adjusted relative volume; $V_{i,k}$ = relative volume or trading volume / shares outstanding, for firm i in day k; $MVOL_i$ = the mean relative volume during the estimation period.

A cumulative variance of volumes metric (CVRVOL), similar to a mean-adjusted CVR, is also computed as follows:

$$CVRVOL_{i,L} = 1/L \sum_{K=1}^{L} (VOL^2_{i,k} / SVOL^2_i)$$

where
$VOL_{i,k} = V_{i,k} - MVOL_i$; $VOL_{i,k}$ = the announcement-period abnormal relative volume; $V_{i,k}$ = relative volume or trading volume / shares outstanding, for firm i in day k; $SVOL_i$ = the standard deviation of relative volumes during the estimation period; and $MVOL_i$ = the mean relative volume during the estimation period.

The estimation period extens from day {-130} to day {-11] (i.e., 120 daily volumes), and day {0} is the filing date of Form 10-Q.

The symbols of *, **, and *** indicate statistical significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

[b] Two high-tech (low-tech) firms whose cusip numbers are 11162110 and 53222610 (12612W10 and 90212410) are lost due to missing volume data in this analysis, reducing the sample size to 142 (83) for high-tech (low-tech) firms.

Multi-variate Analysis

The results demonstrated in Table 6 are based on multivariate analyses to test for whether a significant decrease in stock return variability (mean-adjusted volume) in the post-SOX quarter for high-tech firms vis-à-vis low-tech firms (both high-tech and low-tech firms), documented in Tables 4, can be affected by other information environment variables such as information intensity, midweek filing, market capitalization, institutional ownership holdings, and the amount of accounting accruals.[30]

As shown in Table 6, this paper's first hypothesis that stock price variability is lower for high-tech firms in the post-SOX period than in the pre-SOX period during quarterly reporting has still been supported by the presence of strong negative coefficients for the quarterly dummy variable (QDUM), which are in general significant at the 10% (5%) level in two-tailed tests for the high-tech sector with a t-statistic of -1.85 (-2.55) in Patell's CVR (Mean-Adjusted CVR). However, the QDUM coefficients are insignificant (significant at the 5% level) for the low-tech sector when Patell's CVR (Mean-Adjusted CVR) was adopted as a measure of price variability, which is consistent with the results of Panel B of Table 4.[31]

The regression results based on mean-adjusted volume (CAVOL) also show negative signs for both high-tech and low-tech firms in post-SOX period, but the t-statistics for QDUM and QDUMD variables are not statistically significant enough. While abnormal returns and unusual volume both suggest decision usefulness of accounting information, abnormal returns is the better indicator because, according to Kim and Verrecchia, (1997), security price change is a more precise measure of usefulness than trading volume [Scott (2006)]. The multivariate model in Table 6 is similar to the one used in Griffin (2003) and was primarily intended to be used for the tests of price variability, not abnornmal trading volume. That is why the F-statistic (0.89), which measures the overall significance of a model, is not significant in the case of CAVOL. The results of CAVOL in the multivariate tests are also consistent with the claim of Kim and Verrecchia (1991) that trading volume is a noisier measure than stock price.[32]

[30] We also used Beaver's CVR as a dependent variable and obtained similar results. As for trading volume tests, since Holthausen and Verrecchia (1990, p. 200) indicate that information content is reflected in trading volume and the second moment of trading (CVRVOL) is unnecessary, we showed the results based only on mean-adjusted volume in these multivariate analyses.

[31] The mean-adjusted CVR in panel B of Table 4 shows a significant decrease following SOX for even low-tech firms when the last quarter before SOX and the first quarter in fiscal year 2003 following SOX were compared.

[32] White (1980) offers a general test for model misspecification based on the null hypothesis that the errors are both homoskedastic and independent of regressors and that the linear specification of the model is correct. Whenever there was any violation (the significance level of 10% or higher) of these assumptions in the tests of the regression models for both high-tech and low-tech firms, White's heteroskedasticity-consistent t-statistics replaced standard t-statistics. As shown in Table 6, we find no violations of model misspecification. We also examine a possible muticollinearity problem using the variance inflation factor (VIF). Multicollinearity can be problematic when it exceeds 5.0 (Judge et al. [1988]). In both regression models, there are no significant signs of serious multicollinearity problems as they are all less than 5 except the LMVD variable which has a VIF of 6.3.

Table 6. Regression of Price Variability (CVR) or Mean-Adjusted Volume (CAVOL) on Information Environment Variables around 10-Q filing dates between the Last Quarter before SOX and the First Quarter in 2003 after SOX (t-statistics in parentheses)[a,b]

Model: CVRi,t or CAVOLi,t = β0 + β1 INi,t + β2 INDi,t + β3 QDUMi,t + β4 QDUMDi,t + β5 WKi,t + β6 WKDi,t + β7 LMVi,t + β8 LMVDi,t + β9 IHi,t + β10 IHDi,t + β11 AAi,t + β12 AADi,t + εi,t

Dependent Variable

	Predicted Sign	Patell's CVR [0,+2]	Mean-Adjusted CVR [0,+2]	CAVOL [0,+2]
β_0 (Intercept)		-0.077(-2.34)**	-0.070(-2.05)**	0.009(0.26)
β_1 (IN)	+	-0.046(-0.77)	-0.056(-0.92)	-0.029(-0.48)
β_2 (IND)	?	0.001(0.01)	0.024(0.33)	0.042(0.59)
β_3 (QDUM)	-	-0.031(-0.56)	-0.132(-2.38)**	-0.020(-0.35)
β_4 (QDUMD)	-	-0.118(-1.85)*	-0.167(-2.55)**	-0.031(-0.46)
β_5 (WK)	+	-0.060(-1.00)	-0.007(-0.11)	-0.055(-0.90)
β_6 (WKD)	?	0.041(0.63)	-0.010(-0.15)	0.041(0.61)
β_7 (LMV)	-	0.026(0.58)	-0.036(-0.78)	0.059(1.28)
β_8 (LMVD)	?	0.061(0.72)	0.167(1.91)*	0.012(0.13)
β_9 (IH)	-	-0.021(-0.37)	0.060(1.05)	0.085(1.48)
β_{10} (IHD)	?	0.012(0.20)	0.002(0.04)	-0.087(-1.42)
β_{11} (AA)	+	0.114(1.53)	0.072(0.93)	0.091(1.17)
β_{12} (AAD)	?	-0.105(-1.46)	-0.035(-0.47)	-0.070(-0.94)
F-Value(p-value):		1.91(0.03)*	5.48(0.00)***	0.89(0.56)
R^2 *(Adj. R^2)*:		0.051(0.024)	0.134(0.110)	0.025(-0.003)
Number of Observations:		N = 450	N = 450	N = 450
Chi-Square (p-value):		44.32(0.87)	65.19(0.16)	50.94(0.70)
VIF (Variance Inflation Factor):		1.83(LMV)-6.30(LMVD)		

[a] *, **, and *** indicate statistical significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

[b] Where for firm i in year t: IN = Information Intensity (1=high:100 or more filings per day, 0=low); IND=IN*HT, where HT = 1 if the firm belongs to high-tech sample, HT=0 otherwise;QDUM=(1=the first quarter in 2003 following SOX, 0=the quarter right before SOX);QDUMD=QDUM*HT; WK=midweek filing (Mon, Fri=1, other days =0); WKD=WK*HT;LMV=logarithm of market value of equity; LMVD=LMV*HT; IH

= Institutional Holdings measured as percentage of shares held by institutions deflated by 100; IHD=IH*HT; AA=accounting accruals measured as net income from continuing operations less operating cash flow deflated by shareholders' equity; and AAD=AA*HT. Two(two) high-tech (low-tech) firms were lost due to the lack of data in these multivariate analyses.

The results in price variability, volume, and analysts' forecast dispersion tests together suggest that the effect of reduced informedness dominates the effect of increased consensus for high-tech firms. But the effects of both informedness and consensus cancel each other out for low-tech firms.

4.2 Tests of Conservatism

In this subsection, we report results on the change in conservatism of high-tech and low-tech firms. In the first measure of conservatism, firms with more negative accruals are said to be more conservative; in the second measure, we use the Basu (1997) conservatism metric to determine if the metric has changed before and after SOX for the two samples.

4.2.1 Cumulative Non-operating Accruals and Performance-Matched Discretionary Accruals

The test results from the use of two accrual proxies of conservatism – Cumulative Non-operating Accruals (CNA) and Performance-Matched Discretionary Accruals (PMDA) are reported in Table 7. Specifically, Panel A shows that cumulative non-operating accruals (CNA) are negative across pre- and post-SOX periods. In general, both high-tech and low-tech firms demonstrate more negative numbers of cumulative non-operating accruals in the post-SOX period. High-tech firms show some evidence of heightened conservatism measured by cumulative non-operating accruals. The difference between pre-SOX and post-SOX periods is statistically significant at the 10% level in two-tailed tests only under parametric tests when deflated by net sales. Low-tech firms do not reveal any significant shift in conservatism in the post-SOX period.

The results of Panel B in Table 7 also reveal that high-tech firms demonstrate more negative (conservative) numbers of performance-matched discretionary accruals in the post-SOX period vis-à-vis the pre-SOX period than low-tech firms. The difference between pre-SOX and post-SOX periods is statistically significant at the 1% (10%) level in two-tailed (one-tailed) tests under parametric (non-parametric) tests for high-tech firms. Low-tech firms reveal some weak shift in conservatism in the post-SOX period only under non-parametric tests in one-tailed tests at the 10% level.

In summary, the results of Table 7 reflect support for this paper's third hypothesis that the level of accounting conservatism is higher for high-tech firms during the disclosure of accounting information after the Sarbanes-Oxley Act went into effect. The evidence of increased levels of conservatism in financial reporting following SOX and the resulting requirement by the SEC that financial statements be certified by CEOs and CFOs is also consistent with the results of Lobo and Zhou (2006), at least for the high-tech sector.

Table 7. Conservatism Metrics: Cumulative Non-operating Accruals (CNA) and Performance-Matched Discretionary Accruals (PMDA)

Pre SOX versus Post SOX period[a,b]

	1998-2000		2002-2004		Matched-Pair	
	Mean	Median	Mean	Median	Student's t	Wilcoxon Signed-Rank Z
Panel A: CNA						
HT:	**-0.239**	**-0.024**	**-1.672**	**-0.028**	**1.61***	**-0.21**
LT:	**-0.014**	**-0.012**	**-0.023**	**-0.014**	**1.19**	**1.24**
Panel B: PMDA						
HT:	**-2.225**	**-0.037**	**-11.590**	**-0.106**	**3.18*****	**1.41**
LT:	**0.004**	**-0.011**	**-0.101**	**-0.008**	**0.24**	**1.61***

[a] Total accruals (before depreciation) = Net Income before Depreciation – Cash Flows from Operations; Non-operating Accruals = Total Accruals (before depreciation) – Operating Accruals; and Operating Accruals = ΔAccounts Receivable + ΔInventories + ΔPrepaid Expenses - ΔAccounts Payable - ΔTaxes Payable. Cumulative non-operating accruals (CNA) are deflated by net sales.

$PMDA_{i,t}$ = performance-matched discretionary accruals deflated by lagged assets; calculated as discretionary accruals of firm i estimated from Modified Jones model minus discretionary accruals of firm j that has the closest ROA in the same industry,

[b] The symbols of *, **, and *** indicate statistical significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

In Table 8, high-tech and low-tech firms are compared in both Cumulative Non-operating Accruals (CNA) and Performance-Matched Discretionary Accruals (PMDA), two proxies of conservatism. The results of Panel A demonstrate that cumulative non-operating accruals (CNA) are more negative for HTC than for LTC across pre- and post-SOX periods. More specifically, the table compares means and medians of cumulative non-operating accruals between the two groups in the pre-SOX period and the post-SOX period. In the pre-SOX period, the mean (median) of non-operating accruals deflated by net sales is –0.239 (-0.024) for HT, compared to –0.014 (-0.012) for LT. Results show that cumulative non-operating accruals are lower for HT than for LT, and t-tests and Wilcoxon tests indicate that the

differences are significant at the 1% level when net sales are used as the deflator. [33]

In the post-SOX period, the mean (median) of non-operating accruals deflated by net sales is –1.672 (-0.028) for HT, and –0.023 (-0.014) for LT. Results show that cumulative non-operating accruals are also lower for HT than for LT, and t-tests and Wilcoxon tests indicate that the differences are significant, on average, at 5% levels.

Panel B of Table 8 presents the results for the differences between high-tech and low-tech firms in performance-matched discretionary accruals. In both 1998-2000 and 2002-2004 sample periods, high-tech firms adopted more income-decreasing (conservative) accounting methods than low-tech firms in financial reporting. In general, their differences are significant at the 1% (10%) level under the parametric (non-parametric) tests. The evidence of greater use of income-decreasing methods for high-tech firms is consistent with the results of Kwon, Yin, and Han (2006).[34]

The empirical results shown in Table 8 support this paper's fourth hypothesis that the financial reporting of high-tech firms is more conservative than that of low-tech firms in the post-SOX period. This evidence of high-tech firms' higher levels of conservatism may explain a significant decrease in informedness that dominated an increase in consensus during the disclosure of accounting information after the Sarbanes-Oxley Act.

4.2.2 Basu's Conservatism Metric

Panel A of Table 9 presents regression results on Basu's conservatism metric and panel B presents the test statistics on the coefficients of interests. For bad news, we find a significantly positive (an insignificant) coefficient for increased levels of conservatism for high-tech firms (low-tech firms) following SOX. The coefficient ($\gamma_1+\gamma_3+\phi_1+\phi_3$) for high-tech firms that represents Basu's conservatism measure is reliably positive and significant with a F-value of 9.14, which is significant at the 1% level, whereas the coefficient ($\gamma_1+\phi_1$) for low-tech firms is insignificant. The comparison between high-tech and low-tech firms based on F-value is positive as predicted but not reliably significant.

For good news, as predicted, high-tech firms show an insignificant coefficient ($\gamma_1+\gamma_3$) for positive returns (a proxy for good news) to be incorporated in earnings. This implies that high-tech firms incorporate gains slowly and gradually in earnings, consistent with predictions of the Basu's conservatism definition in the post-SOX period. The coefficient's F-value is only 0.81, which is not significant at the 10% level. When we compare the speed of incorporation of good news in earnings between high-tech and low-tech firms, the F-value is 3.77 that is significant at the 10% level, and supports slower incorporation of good news in earnings for high-tech firms vis-à-vis low-tech firms in the post-SOX period. Therefore, the empirical results of Table 9 are supportive of this paper's third hypothesis that high-tech firms, relative to low-tech firms, incorporate losses more quickly than gains when they report income in the post-SOX period.

Interestingly, the results of high-tech (low-tech) firms are consistent (inconsistent) with those of Lobo and Zhou (2006) who find that firms incorporate losses more quickly than gains when they report earnings in the post-SOX period. This implies that the level of industry participation (i.e., high-tech versus low-tech) can be a discriminating factor in assessing the effect of Section 302 accounting disclosures.

[33] The results in Panel A are consistent with those documented in Kwon, Yin, and Han (2006). The results were qualitatively similar when assets were used as the deflator.

[34] Kwon, Yin and Han (2006) present possible explanations for greater use of income-decreasing methods in high-tech industries. Those can be summarized as follows: (1) the threat of shareholder litigation increases high-tech managers' incentives to practice conservative accounting; (2) high-tech firms that publicly commit to conservative accounting choices convey credible and favorable private information about future cash flow by signaling that they have the ability to meet investors' expectations about future growth and therefore they have an incentive to engage in conservative reporting; and (3) high-tech firms attract more attention from financial analysts and the investment community than low-tech firms because of their enormous opportunities for growth and favored status in the technology-based New Economy. As a result, high-tech firms undergo closer scrutiny by financial analysts as objects of investment recommendations to their customers and are likely to be more prudent in their financial reporting.

Table 8. Conservatism Metrics: Cumulative Non-operating Accruals (CNA) and Performance-Matched Discretionary Accruals (PMDA)
High-Tech versus Low-Tech Firms[a,b]

	HT		LT		Two Sample	
	Mean	Median	Mean	Median	Student's t	Wilcoxon Rank-Sum Z
Panel A: CNA						
1998-2000:	**-0.239**	**-0.024**	**-0.014**	**-0.012**	**-3.54 *****	**-4.30 *****
2002-2004:	**-1.672**	**-0.028**	**-0.023**	**-0.014**	**-1.86 ***	**-3.65 *****
Panel B: PMDA						
1998-2000:	**-2.225**	**-0.037**	**0.004**	**-0.011**	**-4.63*****	**-1.73***
2002-2004:	**-11.590**	**-0.106**	**-0.101**	**-0.008**	**-3.85*****	**-0.52**

[a] Total accruals (before depreciation) = Net Income before Depreciation – Cash Flows from Operations; Non-operating Accruals = Total Accruals (before depreciation) – Operating Accruals; and Operating Accruals = ΔAccounts Receivable + ΔInventories + ΔPrepaid Expenses - ΔAccounts Payable - ΔTaxes Payable. Cumulative non-operating accruals (CNA) are deflated by net sales.

$PMDA_{i,t}$ = performance-matched discretionary accruals deflated by lagged assets; calculated as discretionary accruals of firm i estimated from Modified Jones model minus discretionary accruals of firm j that has the closest ROA in the same industry,

[b] The symbols of *, **, and *** indicate statistical significance levels of 10%, 5%, and 1%, respectively, in two-tailed tests.

Table 9. Conservatism Metrics: Basu's Accounting Conservatism Measure High-Tech versus Low-Tech Firms

Panel A: OLS Regression[a]

$$\text{Earnings} = \alpha_0+\alpha_1*\text{Post}_{it}+\alpha_2*\text{HTC}_{it}+\alpha_3*\text{HTC}_{it}*\text{Post}_{it} +\beta_0*\text{D}_{it}+\beta_1*\text{Post}_{it}*\text{D}_{it}+ \beta_2*\text{HTC}_{it}*\text{D}_{it}+\beta_3*\text{HTC}_{it}*\text{Post}_{it}*\text{D}_{it} + \gamma_0*\text{Return}_{it}+\gamma_1*\text{Post}_{it}*\text{Return}_{it}+\gamma_2*\text{HTC}_{it}*\text{Return}_{it}+\gamma_3*\text{HTC}_{it}*\text{Post}_{it}*\text{Return}_{it} +\phi_0*\text{D}_{it}*\text{Return}_{it}+\phi_1*\text{Post}_{it}*\text{D}_{it}*\text{Return}_{it}+\phi_2*\text{HTC}_{it}*\text{D}_{it}*\text{Return}_{it}+\phi_3*\text{HTC}_{it}*\text{Post}_{it}*\text{D}_{it}*\text{Return}_{it} + \varepsilon_{it}$$

Variables	Estimated Coefficient	t-statistic
Intercept(α_0)	-0.0419	-2.55***
α_1*Post	-0.1840	-3.62***
α_2*HTC	-0.3025	-7.21***
α_3*HTC$_{it}$*Post	0.2257	3.82*** *
β_0*D	-0.1201	-2.27**
β_1*Post$_{it}$*D	0.0378	0.58
β_2*HTC*D	0.1609	2.56***
β_3*HTC*Post*D	-0.0352	-0.49
γ_0*Return	0.0917	1.05
γ_1*Post*Return	0.1839	2.62***
γ_2*HTC*Return	-0.0035	-0.04
γ_3*HTC*Post*Return	-0.1449	-1.94*
ϕ_0*D*Return	-0.0802	-1.40
ϕ_1*Post*D*Return	-0.0718	-0.98
ϕ_2*HTC*D*Return	0.1362	2.16**
ϕ_3*HTC*Post*D*Return	0.2077	2.46**
N	1883	
Adjusted R^2	14.18%	
F-Value	20.53***	
Chi-Square (p-value)	33.70 (0.38)	

Table 9 (continued)

Panel B : Test of Conservatism

		HT	LT	HT vs LT
Good News (Positive Returns)				**If HT > LT in the level of conservatism following SOX**
Coefficient		$\gamma_1 + \gamma_3$	γ_1	γ_3
		0.0389	**0.1839**	**-0.1450**
	F-value	**0.81**	**6.89*** **	**3.77***
Expected Sign If more conservative after SOX		**less positive or near zero**	**less positive or near zero**	**negative**
Bad News (Negative Returns)				**If HT > LT in the level of conservatism following SOX**
Coefficient		$\gamma_1 + \gamma_3 + \phi_1 + \phi_3$	$\gamma_1 + \phi_1$	$\gamma_3 + \phi_3$
		0.1749	**0.1121**	**0.0628**
	F-value	**9.14*** **	**1.79**	**0.44**
Expected Sign If more conservative after SOX		**positive**	**positive**	**positive**

[a] Post is a dummy variable that takes the value of one if the observation belongs to 2002, 2003, and 2004 fiscal years and takes the value of zero if it belongs to 1998, 1999, and 2000 fiscal years; HTC is a dummy variable that takes the value of one if the firm is classified as a high-tech firm and takes the value of zero otherwise; D is a dummy variable that takes the value of one if the stock return is negative and takes the value of zero if it is positive; Return is the 12-month stock return of the firm for the fiscal year. The dependent variable, Earnings, is the earnings per share for firm i in fiscal year t, deflated by the stock price per share at the beginning of the fiscal year. Firms with the data of a stock price that is less than 10 cents are eliminated due to potential extreme outlier effects.

The symbols of *, **, and *** indicate statistical significance levels of 10%, 5%, and 1%, respectively, in two-tailed test

4.3 Sensitivity Analyses

4.3.1 Extreme Value Treatment

For all the regression analyses in this study, several methods of truncation are used: deletions of observations that lie outside mean ± 3std, mean ± 4std, and mean ± 5std; deletion of extreme 1% of variable distributions; and deletion of extreme 2% of variable distributions. The results presented in Tables 6 and 9 are robust to such alternative treatments.

4.3.2 No Earnings Announcements within 7 days of the 10-Q filing date

Twelve high-tech and eleven low-tech firms filed their 10-Q reports in the quarters around SOX within 7 days of the filing date. The empirical results demonstrated in Tables 4, 5, and 6 remain qualitatively unchanged when we eliminate these firms from both high-tech and low-tech samples and conducted the same tests.

4.3.3 Other Event Windows

We adopt three additional event windows including [-2, +2], [-1, +1] and [0, +1] in addition to the reported window [0, +2]. The results from these analyses are generally similar to those reported in Tables 4, 5, and 6.

4.4 Interpretation of the empirical results

Consistent with theoretical predictions provided by Holthausen and Verrecchia (1990), our empirical results reveal that trading volume decreased for both high-tech and low-tech firms. The significant decrease in stock return variability for high-tech firms following the Act indicate that decreases in the informedness of post-SOX disclosures (Section 302) more than compensate for increases in the market agents' consensus views of accounting disclosures. Also, the insignificant decrease in stock return variability for low-tech firms following the Act shows that decreases in the informedness of post-SOX disclosures equally compensate for increases in the market agents' consensus views of the disclosures. In both cases, the common noise (n) component in the information signal received by the market agents at the time of an announcement of a quarterly report following the Act very likely increased due to the common challenge – new accounting rule (Management certifications and internal control deficiency disclosures through Form 10-Q reports under Section 302 of SOX). [35]

The effects of informedness and consensus on trading volume are reinforcing. Therefore, the decrease in trading volume should be found in both high-tech and low-tech samples. However, the effects of informedness and consensus on stock return variability are countervailing. Accordingly, any decrease or increase in stock return variability depends upon which of the two effects dominates in a particular informational setting. The significant decrease in stock return variability only in high-tech industries is likely to be caused by more conservative accounting practices adopted by high-tech firms, which promotes more reliable financial statements, but sacrifices the disclosure of more voluntary, relevant accounting information. Managers of high-tech firms in a post-SOX environment are more likely to be in fear of litigation and are willing to reduce the amount of less verifiable but relevant information on their financial statements.

5. Concluding remarks

This paper draws upon the theory on the price and volume behavior explored by Holthausen and Verrecchia (1990) and examines how managers of high-tech firms, vis-à-vis low-tech firms, place information in their 10-Q reports through measuring investors' informedness and consensus when SOX 302 took effect for the first time. The theory predicts that when common noise in accounting information increases, informedness decreases but the consensus increases. In addition, this decrease in informedness is associated with a decrease in stock return variability and a decrease in trading volume whereas the increase in consensus is associated with an increase in stock return variability and a decrease in trading volume.

Consistent with these predictions, we find, based on the univariate analysis, that trading volume has decreased post SOX for both high-tech and low-tech firms when we investigate investors' response during a short window around quarterly report dates. Since the effects of informedness and consensus on trading volume are reinforcing, the decrease in trading volume should be found in both high-tech and low-tech samples. However, the effects of informedness

[35] This study assumes that at the disclosure of accounting information following SOX 302 (common event), there are no systematic changes in the idiosyncratic noise (s) which comes from differences in age, sex, education levels, the number of years of professional experience, etc. of the investors. This paper's empirical findings also do not support an argument for a possible systematic increase in the idiosyncratic noise. According to Holthausen and Verrecchia (1990), informedness is likely to be reduced because of the greater noise in agents' information, and consensus is likely to be decreased because agents' signals are less conditionally dependent when the idiosyncratic noise increases. In this scenario, there would be an unambiguous decline in the price variability for both high-tech and low-tech firms, which is not supported by this paper's primary empirical results.

and consensus on stock return variability are countervailing, and therefore any decrease or increase in stock return variability depends upon which of the two effects dominates in a particular informational setting.

Based on both univariate and multivariate analyses, we find evidence that the decrease in stock return variability is found only in the sample of high-tech firms, which can be explained by the implementation of more conservative accounting methods in the high-tech sector. The evidence of decreased levels of stock return variability due to heightened conservatism in the post-SOX period is also consistent with the empirical results of Hui et al. (2009) who find a negative association between conservatism and the frequency, specificity, and timeliness of management forecasts.

Significantly lower levels of stock return variability and trading volume for high-tech firms following SOX 302 may reveal the fact that the informedness effect dominates the consensus effect. High-tech firms may have attempted to satisfy higher standards of information reliability required under SOX 302 at the expense of the relevance of some voluntary information disclosures. Our results are robust to various sensitivity analyses, including controlling for potentially confounding effects related to earnings announcements, using alternative specifications of price variability and trading volume measures, and adopting a variety of procedures to attenuate the effects of extreme values.

Our paper is subject to two caveats. First our interpretation is based on the assumption that Section 302 – Internal Control Effectiveness Disclosures of SOX promotes reliability more than relevance of financial statements and thus a significant decrease in price variability for high-tech firms is a result of the decreased relevance that overshadows the increased reliability of financial statements at the first-time disclosure of internal control effectiveness information on Form 10-Q reports around SOX. Second, the soundness of our interpretation hinges on the validity of the proxies for informedness and consensus.

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Appendix A

DELPHI CORPORATION

FORM 10-Q

As of September 30, 2002

ITEM 4. CONTROLS AND PROCEDURES

At the beginning of the third quarter, in response to recent legislation and additional requirements, we reviewed our internal control structure and our disclosure controls and procedures. As a result of such review we implemented minor changes, primarily to formalize and document the already robust procedures in place. We have designed our disclosure controls and procedures to ensure that material information related to Delphi, including our consolidated subsidiaries, is made known to our disclosure committee, including our principal executive officer and principal financial officer on a regular basis, in particular during the period in which the quarterly reports are being prepared. As required, we will evaluate the effectiveness of these disclosure controls and procedures on a quarterly basis, and did so on October 11, 2002, a date within 90 days prior to the filing of this quarterly report. We believe as of that date, such controls and procedures are operating effectively as designed.

We presented the results of our most recent evaluation to our independent auditors, Deloitte and Touche LLP, and the Audit Committee of the Board of Directors. Based on such evaluation, the Company's management, including the principal executive officer and principal financial officer, concluded that the Company's disclosure controls and procedures are adequate to insure the clarity and material completeness of the Company's disclosure in its periodic reports required to be filed with the SEC and there are no significant deficiencies in the design or operation of internal controls which could significantly affect our ability to record, process, summarize and report financial data.

Appendix B

INTEL CORPORATION

FORM 10-Q

As of September 28, 2002

Item 4. Controls and Procedures

Quarterly evaluation of the company's Disclosure Controls and Internal Controls. Within the 90 days prior to the date of this Quarterly Report on Form 10-Q, the company evaluated the effectiveness of the design and operation of its "disclosure controls and procedures" (Disclosure Controls), and its "internal controls and procedures for financial reporting" (Internal Controls). This evaluation (the Controls Evaluation) was done under the supervision and with the participation of management, including our Chief Executive Officer (CEO) and Chief Financial Officer (CFO). Rules adopted by the SEC require that in this section of the Quarterly Report we present the conclusions of the CEO and the CFO about the effectiveness of our Disclosure Controls and Internal Controls based on and as of the date of the Controls Evaluation.

CEO and CFO Certifications. Appearing immediately following the Signatures section of this Quarterly Report there are two separate forms of "Certifications" of the CEO and the CFO. The first form of Certification is required in accord with Section 302 of the Sarbanes-Oxley Act of 2002 (the Section 302 Certification). This section of the Quarterly Report which you are currently reading is the information concerning the Controls Evaluation referred to in the Section 302 Certifications and this information should be read in conjunction with the Section 302 Certifications for a more complete understanding of the topics presented.

Disclosure Controls and Internal Controls. Disclosure Controls are procedures that are designed with the objective of ensuring that information required to be disclosed in our reports filed under the Securities Exchange Act of 1934 (Exchange Act), such as this Quarterly Report, is recorded, processed, summarized and reported within the time periods specified in the Securities and Exchange Commission's (SEC) rules and forms. Disclosure Controls are also designed with the objective of ensuring that such information is accumulated and communicated to our management, including the CEO and CFO, as appropriate to allow timely decisions regarding required disclosure. Internal Controls are procedures which are designed with the objective of providing reasonable assurance that (1) our transactions are properly authorized; (2) our assets are safeguarded against unauthorized or improper use; and (3) our transactions are properly recorded and reported, all to permit the preparation of our financial statements in conformity with generally accepted accounting principles.

Limitations on the Effectiveness of Controls. The company's management, including the CEO and CFO, does not expect that our Disclosure Controls or our Internal Controls will prevent all error and all fraud. A control system, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, within the company have been detected. These inherent limitations include the realities that judgments in decision-making can be faulty, and that breakdowns can occur because of simple error or mistake. Additionally, controls can be circumvented by the individual acts of some persons, by collusion of two or more people, or by management override of the control. The design of any system of controls also is based in part upon certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions; over time, control may become inadequate because of changes in conditions, or the

degree of compliance with the policies or procedures may deteriorate. Because of the inherent limitations in a cost-effective control system, misstatements due to error or fraud may occur and not be detected.

Scope of the Controls Evaluation. The CEO/CFO evaluation of our Disclosure Controls and our Internal Controls included a review of the controls' objectives and design, the controls' implementation by the company and the effect of the controls on the information generated for use in this Quarterly Report. In the course of the Controls Evaluation, we sought to identify data errors, controls problems or acts of fraud and to confirm that appropriate corrective action, including process improvements, were being undertaken. This type of evaluation will be done on a quarterly basis so that the conclusions concerning controls effectiveness can be reported in our Quarterly Reports on Form 10-Q and Annual Report on Form 10-K. Our Internal Controls are also evaluated on an ongoing basis by our Internal Audit Department, by other personnel in our Finance organization and by our independent auditors in connection with their audit and review activities. The overall goals of these various evaluation activities are to monitor our Disclosure Controls and our Internal Controls and to make modifications as necessary; our intent in this regard is that the Disclosure Controls and the Internal Controls will be maintained as dynamic systems that change (including with improvements and corrections) as conditions warrant.

Among other matters, we sought in our evaluation to determine whether there were any "significant deficiencies" or "material weaknesses" in the company's Internal Controls, or whether the company had identified any acts of fraud involving personnel who have a significant role in the company's Internal Controls. This information was important both for the Controls Evaluation generally and because items 5 and 6 in the Section 302 Certifications of the CEO and CFO require that the CEO and CFO disclose that information to our Board's Audit Committee and to our independent auditors and to report on related matters in this section of the Quarterly Report. In the professional auditing literature, "significant deficiencies" are referred to as "reportable conditions"; these are control issues that could have a significant adverse effect on the ability to record, process, summarize and report financial data in the financial statements. A "material weakness" is defined in the auditing literature as a particularly serious reportable condition where the internal control does not reduce to a relatively low level the risk that misstatements caused by error or fraud may occur in amounts that would be material in relation to the financial statements and not be detected within a timely period by employees in the normal course of performing their assigned functions. We also sought to deal with other controls matters in the Controls Evaluation, and in each case if a problem was identified, we considered what revision, improvement and/or correction to make in accord with our on-going procedures.

In accord with SEC requirements, the CEO and CFO note that, since the date of the Controls Evaluation to the date of this Quarterly Report, there have been no significant changes in Internal Controls or in other factors that could significantly affect Internal Controls, including any corrective actions with regard to significant deficiencies and material weaknesses.

Conclusions. Based upon the Controls Evaluation, our CEO and CFO have concluded that, subject to the limitations noted above, our Disclosure Controls are effective to ensure that material information relating to Intel and its consolidated subsidiaries is made known to management, including the CEO and CFO, particularly during the period when our periodic reports are being prepared, and that our Internal Controls are effective to provide reasonable assurance that our financial statements are fairly presented in conformity with generally accepted accounting principles.

Appendix C

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-Q

☒ QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the Quarterly Period Ended March 31, 2003

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the Transition Period From _____ to _____

Commission File Number 0-14278

MICROSOFT CORPORATION
(Exact name of registrant as specified in its charter)

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Item 4. Controls and Procedures

Under the supervision and with the participation of the Company's management, including the Company's Chief Executive Officer and Chief Financial Officer, the Company has evaluated the effectiveness of the design and operation of its disclosure controls and procedures pursuant to Exchange Act Rule 13a-14(c) within 90 days of the filing date of this quarterly report. Based on that evaluation, the Chief Executive Officer and Chief Financial Officer have concluded that these disclosure controls and procedures are effective. There were no significant changes in the Company's internal controls or in other factors that could significantly affect internal controls subsequent to the date of their evaluation.