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ACADEMY OF ACCOUNTING AND FINANCIAL STUDIES JOURNAL

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LETTER FROM THE EDITORS

Welcome to the *Academy of Accounting and Financial Studies Journal.* The editorial content of this journal is under the control of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world. The mission of the *AAFSJ* is to publish theoretical and empirical research which can advance the literatures of accountancy and finance.

Dr. Mahmut Yardimcioglu, Karamanoglu Mehmetbey University, is the Accountancy Editor and Dr. Denise Woodbury (Deceased), Southern Utah University, was the Finance Editor. Their joint mission is to make the *AAFSJ* better known and more widely read.

As has been the case with the previous issues of the *AAFSJ*, the articles contained in this volume have been double blind refereed. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies.

The Editors work to foster a supportive, mentoring effort on the part of the referees which will result in encouraging and supporting writers. They will continue to welcome different viewpoints because in differences we find learning; in differences we develop understanding; in differences we gain knowledge and in differences we develop the discipline into a more comprehensive, less esoteric, and dynamic metier.

Information about the Allied Academies, the *AAFSJ*, and our other journals is published on our web site. In addition, we keep the web site updated with the latest activities of the organization. Please visit our site and know that we welcome hearing from you at any time.

Mahmut Yardimcioglu, Karamanoglu Mehmetbey University
Accounting Editor

Denise Woodbury, Southern Utah University (Deceased)
Finance Editor

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LETTER FROM ALLIED ACADEMIES

It is with the greatest sadness that we inform you of the death of Dr. Denise Woodbury on May 2, 2010. She has been a tremendous force in the Allied Academies' organization and she has been a true friend of the Carlands for many years. She has been a member since 1997 and has served us in many ways. She will be truly missed; yet she leaves a wonderful legacy of caring and hope for all who knew her.

The Carlands have set up a scholarship fund for Denise through the Carland Foundation for Learning at the website at www.CarlandFoundation.org You are welcome to make a contribution in her memory at that site or to send a check to Carland Foundation for Learning at PO Box 914, Skyland, NC 28776.

Denise will be missed and long remembered by all.

Jim and JoAnn Carland
Trey and Shelby Carland
Jason Carland

THE EFFECTS OF UNDERWRITER REPUTATION ON PRE-IPO EARNINGS MANAGEMENT AND POST-IPO OPERATING PERFORMANCE

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Kyung Joo Lee, University of Maryland-Eastern Shore
Diane Li, University of Maryland-Eastern Shore
John Jongdae Jin, California State University-San Bernardino

ABSTRACT

The purpose of this study is to investigate whether underwriters play any systematic and significant role for IPO issuers. More specifically, we hypothesize that there is a negative relation between underwriter reputation and earnings management before an IPO (certification role) and that there is a positive relation between underwriter reputation and firm operating performance after an IPO (monitoring role). Using a sample of 369 IPO's over six-year period (1997-2002), we find that high-reputation underwriters are associated with less earnings management before an IPO. We also find that IPO issuers with high-reputation underwriters exhibit better post-IPO operating performance after controlling for pre-IPO earnings management. These results support our hypotheses, and are robust across different measures of variables and testing methodologies, including an instrumental variable two-stage least square 2SLS) regression and a weighted least square (WLS) regression.

INTRODUCTION

The information asymmetries between IPO issuers and outside investors are considerable. Under this condition, IPO issuers may seek to increase their offering proceeds through manipulations of reportable earnings before going public. A stream of prior studies shows that IPO issuers employ opportunistic earnings management before issuing IPOs to obtain some gains, including enhancing initial firm values (e.g. Schipper 1989; Chaney and Lewis 1995; Teoh et al. 1998a, 1998b; Ducharme et al. 2001). For example, Teoh et al. (1998b) find evidence that IPO firms, on average, have high positive issue-year earnings and discretionary accruals, followed by poor long-run earnings and negative discretionary accruals.

However, prior studies on IPO earnings management have largely overlooked the potential roles played by underwriters. Ducharme et al. (2001) include both underwriter reputation and discretionary accruals as explanatory variables of IPO initial firm value, but they have not examined

the relation between underwriter reputation and IPO accruals. Related studies on seasoned equity offerings have found the evidence of a negative relation between auditor quality and earnings management (Zhou and Elders 2004), and an inverse relation between underwriter quality and issuers' accruals (Jo, Kim, and Park 2007).

The purpose of this study is twofold. The first purpose is to document the relation between underwriter reputation and IPO earnings management. We argue that the certification role played by IPO underwriters has a restraining effect on opportunistic earnings management by IPO issuers. The second purpose is to examine a related issue that has not yet been studied in the literature, namely, the relation between underwriter reputation and post-issue operating performance of IPO firms given the presence of earnings management. We argue that underwriters have strong incentives to continue supplying monitoring to the firms they take public such that underwriter reputation is positively related to post-issue operating performance of IPO firms, even after the initial earnings management is taken into consideration.

Using a sample of 369 IPO issuers between 1997 and 2002, we find empirical results supporting our hypotheses. The results show that IPOs underwritten by high-reputation underwriters have less initial discretionary accruals. We also find that post-issue operating performance of IPO issuers are positively related to underwriter reputation. These results suggest that the certification and monitoring roles by underwriters not only restrain opportunistic earnings management, but also enhance post-IPO operating performance of the issuers.

The remainder of this paper is organized as follows. In the next section, we review previous literature and develop hypotheses based on the argument of the certification and monitoring roles played by underwriters. Sample selection and measurement of variables are described in section three. The empirical results are presented in section four. Our conclusions appear in final section.

HYPOTHESIS DEVELOPMENT

Underwriter certification and pre-IPO earnings management

Investment bankers play many roles in the underwriting of security issues including production and certification of information, provision of interim capital, and/or supplying distribution and marketing skills. Certification requires the underwriters to bear the liability imposed by the Securities Act of 1933 for ensuring the fairness of the offer price. The role of underwriter certification in reducing information asymmetries and mitigating the adverse selection faced by outside investors has been extensively studied in the context of IPOs.

In a typical model, in return for fees from the issuing firms, investment bankers produce and certify information about the firms that they underwrite. High-prestige investment bankers can have more stringent standards for certification of IPO firm value and can produce superior information about the firms that they underwrite. IPO issuers can signal favorable private information about their own values by choosing reputable underwriters. On the other hand, investors use an investment

banker's reputation to revise their estimates of issuing-firm value. Thus, high-reputation investment bankers will represent less risky and higher-quality IPOs, and the use of a high-reputation underwriter is a positive signal about IPO firm value.

Since investment bankers are frequent participants in the equity market, they acquire reputation capital that enables them to act as credible certifiers of information. Chemmanur and Fulghieri (1994) find that high-prestige investment bankers, with valuable reputation capital at risk and superior information regarding the issuing firm's prospects, can credibly certify the value of the issues they underwrite.

The certification role of the underwriter has been investigated more specifically in papers that have examined the relationship between underwriter reputation and IPO underpricing. In general these studies argue that high-prestige underwriters are able to more fully price issues, reducing the level of underpricing. For example, Logue (1973), Beatty and Ritter (1986), Titman and Trueman (1986), Carter and Manaster (1990), and Carter, Dark, and Singh (1998) find that IPOs managed by more reputable underwriters are associated with less short-run underpricing. The empirical consensus is that IPO underwriters have performed their certification role in general, driven by the desire to protect their hard earned reputation capital.

Managers exercise some discretion in computing earnings without violating generally accepted accounting principles. It is possible that firms use discretionary accounting choices to manage earnings disclosures around the time of certain types of events. In view of the well-established correlation between earnings and share prices, earnings management activity seems particularly plausible around the time of unseasoned stock issues. According to this opportunism hypothesis, some firms opportunistically manipulate earnings upward before going public and investors are led to make overly optimistic expectations regarding future earnings of the issuers. Thus, issuing firms would be able to obtain a higher share price for their stock issue than they otherwise would. This view of IPO earnings management emphasizes the incentives that entrepreneurs, venture capitalists, and managers have to maximize issue proceeds, given the number of shares offered.

A priori, the opportunistic earnings management of IPO issuers and the certification of underwriters appear at odd with each other. If high levels of abnormal accruals reflect deceptive accounting, we expect the related IPOs to be shunned by investment bankers that have significant reputation capital at stake.[1] Thus, we expect a negative relation between underwriter reputation and IPO earnings management. That is, when high-reputation underwriters are involved, IPO issuers become voluntarily or involuntarily less aggressive with earnings management. IPO issuers with minimal incentives for earnings management would select high-reputation underwriters to enhance underwriter certification, thereby signaling favorable information to outside investors. Our hypothesis is consistent with the implications of the results of Zhou and Elders (2004) and Jo, Kim, and Park (2007) on seasoned equity offerings.

The negative relation between underwriter reputation and earnings management can also be inferred from the underwriter's monitoring function. Block and Hoff (1999) suggest that

underwriters conduct due-diligence investigations to ensure proper information disclosure by issuers and prevent potential legal liabilities. High-reputation underwriters have more resources and more expertise and are therefore more likely to perform higher-quality monitoring in the underwriting process. Thus, high-reputation underwriters are less likely associated with aggressive IPO earnings management. These arguments lead to the following hypothesis:

Hypothesis 1: *There is a negative relation between underwriter reputation and the issuer's earnings management before an IPO.*

Underwriter monitoring and post-IPO operating performance

The certification role of underwriters ends at the IPO, but the monitoring function continues in the post-IPO period (Stoughton and Zechner (1998) and Jain and Kini (1999)). In general, when new securities are issued, issuing firms carefully examine the investment bankers' track record as part of their lead underwriter selection process. Apart from factors such as pricing and marketing, issuers look to other performance areas such as post-issue price stability, market-making, analyst-coverage, and the ability to underwrite subsequent offerings or conclude corporate restructuring activities. Given the lucrative future opportunities, IPO underwriters have strong incentives to remain engaged in the affairs of the firms they take public and to ensure that managers are following value enhancing strategies. Thus, monitoring by underwriters has the potential to improve post-IPO operating performance.

Prior studies suggest that investment bankers play a valuable monitoring function in ensuring managers to follow a value maximizing path. For example, Easterbrook (1984) suggests that when a firm issues new securities its activities are scrutinized by an investment banker or some similar intermediary acting as a monitor for the collective interests of investors of the new securities. Hansen and Torregrosa (1992) suggest that underwriter monitoring improves the issuing firm's performance and reduces agency costs, thereby enhancing firm value. Stoughton and Zechner (1998) argue that given the active and continuing nature of the relationship between investment bankers and institutional investors, they work together in monitoring the affairs of IPO firms. More specifically, Jain and Kini (1999) find that underwriter monitoring is positively related to post-IPO operating and investment performance.

High-prestige underwriters, given their considerable resources, are more likely to supply long-term monitoring in order to continue the business relationships with their clients. Jain and Kini (1999) find that about 75% of lead underwriters assign at least one analyst to track the company they take public. In addition, the presence of institutional investors in the new issues market also promote underwriter monitoring. As implied in Stoughton and Zechner (1998), given the active and continuing nature of the relationship between investment bankers and institutional investors, high-prestige underwriters have strong incentives to work with the institutional investment community in monitoring the affairs of IPO issuers. Thus, high-reputation underwriters are more likely

associated with improvements in post-issue operating performance. These arguments lead to our second hypothesis.

Hypothesis 2: *There is a positive relation between underwriter reputation and the issuer's operating performance after an IPO.*

SAMPLE SELECTION AND DATA

Sample selection

Our initial sample of IPO issuers is obtained from the IPO database of Hoovers Incorporated. The sample period is from April 1996 to December 2004. Several selection criteria are applied sequentially. First, financial institutions and utility firms are excluded. Also, the sample excludes ADRs, firms with offer price less than one dollar and firms with offer size less than one million dollars. Finally, relevant data availability in COMPUSTAT data files over the period of six years surrounding each IPO (i.e., t= [-2,.0,..3]) is required. These selection criteria yield the final sample of 369 IPO issuers.

Information regarding reputation of the IPO underwriters is based on the reputation rankings of Carter and Manaster (1990), and updated according to the information on the website of Jay Ritter. We further classify the underwriters into three groups.[2] If an underwriter's reputation rank is greater than or equal to 9.0, the underwriter is in the high-reputation group; if the reputation rank is between 7.1 and 8.1, the underwriter is in the medium-reputation group; and if the reputation rank is less than or equal to 7.0, the underwriter is in the low-reputation group. There are 196 IPOs in the high-reputation group, 136 in the medium-reputation group, and 37 in the low-reputation group.

Table 1 provides distribution of IPOs by calendar year and underwriter reputation. Two points are worth noting from Table 1. First, almost a half of total IPOs occurred during the bubble period (1999-2000). Second, more than half of sample firms employ high-reputation underwriters. There are only 37 firms (10%) with low-reputation underwriters. Although not shown in table, our sample represents 40 industries (2-digit SIC). However, as typical in IPOs, sample firms are highly concentrated in a few industries, such as computer hardware and software (39.3%) and chemical products (10.8%).

Table 1: IPO Distribution by Year and Underwriter Reputation

Year	All		Underwriter Reputation [1,2]					
			High		Medium		Low	
	N	%	N	%	N	%	N	%
1997	69	18.70	20	28.99	42	60.87	7	10.14
1998	56	15.18	30	53.57	15	26.79	11	19.64
1999	56	15.18	36	64.29	13	23.21	7	12.50
2000	123	33.33	77	62.60	38	30.89	8	6.50
2001	36	9.76	18	50.00	16	44.44	2	5.56
2002	29	7.86	15	51.72	12	41.38	2	6.90
Total	369	100	196	53.12	136	36.86	37	10.03

[1] Underwriter reputation is based on the rankings of Carter and Manaster (1990), and updated according to the information in Jay Ritter's website.

[2] Underwriters are classified into three groups: high-reputation, if the ranking is greater than or equal to 9; medium-reputation, if ranking is between 7.1 and 8.1; low-reputation, if ranking is less than or equal to 7.

Measurement of Variables

Earnings Management

The proxy for earnings management is measured by discretionary accruals, which are obtained relative to expected benchmark accruals (nondiscretionary accruals) based on firm and industry characteristics. We use cross-sectional modified Jones model to estimate discretionary accruals of each IPO firm (Jones, 1991; Dechow et al., 1995; Teoh et al., 1998a).[3]

For each IPO firm, we find at least ten industry-matched firms with the same three-digit SIC code. If we are unable to find ten industry-matched firms with the same three-digit SIC code, we use industry-matched firms with the same two-digit SIC code. For each IPO firm j, we run the following cross-sectional regression model:

$$TAC_{iy}/TA_{iy-1} = \alpha_{0j}[1/ TA_{iy-1}]+ \alpha_{1j}[(\Delta REV_{iy} - \Delta REC_{iy})/ TA_{iy-1}]+ \alpha_{2j}[PPE_{iy}/ Taiy-1]+\epsilon_{iy} \quad (1)$$

where,

TAC_{iy} = total accruals (net income before extraordinary items minus cash flow from operations) in year y for the ith firm in the industry group matched with offering firm j.

TA_{iy} = total assets in year y for the ith firm in the industry group matched with offering firm j.

ΔREV_{iy} = change in revenues in year y for the ith firm in the industry group matched with offering firm j.

ΔREC_{iy} = change in accounts receivable in year y for the ith firm in the industry group matched with offering firm j.

PPE_{iy} = gross property, plant, and equipment in year y for the ith firm in the industry group matched with offering firm j.

Using estimated coefficients from regression model (1), discretionary accruals (DAC) for the issuing firm j in year y are then estimated by subtracting nondiscretionary accruals (NAC) from total accruals (TAC) as follows:

$$DAC_{jy} = TAC_{jy} - NAC_{jy}$$
$$= [TAC_{jy}/TA_{jy-1}] - \alpha_{0j}[1/ TA_{jy-1}] - \alpha_{1j}[(\Delta REV_{jy} - \Delta REC_{jy})/ TA_{jy-1}] - \alpha_{2j}[PPE_{jy}/ TA_{jy-1}]$$

Post-IPO Operating Performance

Post-IPO operating performance was measured by *industry-adjusted* operating return on assets (OROA), which is defined as operating income before taxes and depreciation divided by total assets.[4] Three years data (t=[1,2,3]) after IPO are averaged to obtain the measure.[5] To get *industry-adjusted* OROA, we subtract from each firm's raw OROA the median of a group of firms with matched 3-digit SIC code. If there were insufficient firms (less than 10) in the industry, we use 2-digit SIC to find the matched companies.

Other Variables

Issuer age (AGE): company age from initial founding to IPO years.

Offer size (OS): offer price x number of shares offering.

Sales growth (SG): percentage change in sales up to the year prior to IPO.

Pre-IPO operating performance (PREOP): operating performance in the year before IPO (t=-1). Operating performance is measured by industry-adjusted OROA.

Standard deviation of stock returns (SD): standard deviation of daily returns from day 6 to day 255 after IPO.

Leverage ratio (LEV): debt to equity ratio in year t-1, as measured by the ratio of book value of equity to total asset.

Table 2 presents descriptive statistics for selected variables. Mean and median values of these variables are reported for each underwriter reputation group as well as for total sample. On average, the issuers are 13 years old since their founding, have about $395 million in total assets, are offering $148million, and show 24.4% of leverage ratio.

More importantly, sample firms exhibit some differences in their characteristics. First of all, issuers employing high-reputation underwriters are larger in size, as measured by both total assets and offer sizes, than those with medium and low-reputation underwriters. Also, high-reputation underwriters are more (less) likely to underwrite firms with higher sales growth (operating performance before IPO). However, there are no differences in AGE, SD and LEV among underwriter reputation groups.

Table 2: Descriptive Statistics for Selected Variables

Variables[1]	Total Sample			High Reputation		Median Reputation		Low Reputation	
	Mean	Std Dev	Med	Mean	Med	Mean	Med	Mean	Med
RP	8.173	1.485	9.100	9.100	9.100	7.857	8.100	4.424	5.100
AGE	13.369	19.668	7.000	13.347	5.500	13.596	8.000	12.649	8.000
TA	394.664	2917.183	31.072	678.633	49.604	87.095	29.776	20.919	12.950
OS	148.057	574.962	60.000	227.944	84.000	64.934	47.500	30.405	23.000
SG	4.567	23.562	0.499	7.159	0.547	1.735	0.412	1.244	0.414
PREOP	-1.380	12.891	-0.023	-1.948	-0.043	-0.839	-0.014	-0.360	0.052
SD	0.171	1.537	0.054	0.059	0.057	0.057	0.053	1.187	0.053
LEV	0.244	0.321	0.105	0.239	0.080	0.262	0.161	0.212	0.102

RP = underwriter reputation based on the rankings of Carter and Manaster (1990), and updated according to the information in Jay Ritter's website.
AGE = age of IPO firms (years).
TA = total assets ($ Million) in year t-1.
OS = offer size ($ Million); natural logarithm of OS is used in regression analyses.
SG = sales growth in year t-1.
PREOP = operating performance as measured by the industry-adjusted operating return on assets (operating income before taxes and depreciation divided by total assets) in the year before IPO (t=-1).
SD = standard deviation of daily returns from day 6 to day 255 after IPO.
LEV = debt to equity ratio in year t-1.

EMPIRICAL RESULTS

IPO earnings management and underwriter certification: Hypothesis 1

Table 3 presents the results of comparing discretionary accruals across three subgroups of underwriter reputation (high, medium and low), and corresponding test statistics and p-values. For overall comparison, Kruskal-Wallis χ^2 statistic of 6.929 indicates that there are significant ($\alpha<0.05$) differences in discretionary accruals across underwriter reputation subgroups.

Pairwise comparison results and corresponding Wilcoxon z-statistics show that for IPO issuers employing high-reputation underwriters, median discretionary accruals are smaller than those employing low-reputation underwriters (-0.056 vs. 0.002) and the difference is statistically significant ($\alpha<0.01$). Also, median discretionary accruals show a significant difference ($\alpha<0.10$) between medium- and low- reputation groups. However, there is no significant difference between high- and medium-reputation groups.

In short, discretionary accruals of IPOs underwritten by high- and medium-reputation underwriters are significantly lower than those of IPOs underwritten by low-reputation underwriters. These results indicate that IPO issuers hiring low- reputation underwriters are more likely to adopt aggressive earnings management policies than those hiring high- or medium-reputation underwriters, which is consistent with the prediction of the underwriter certification hypothesis.[6]

Table 3: Comparisons of Discretionary Accruals across Underwriter Reputation Groups

Underwriter Reputation	Mean	Std Dev	Min	25%	50%	75%	Max
High	-0.707	4.786	-62.967	-0.370	-0.056	0.069	1.012
Medium	-0.231	2.431	-26.050	-0.240	-0.050	0.070	7.124
Low	0.398	1.326	-1.381	-0.128	0.002	0.262	6.472
Overall Comparison: Kruskal-Wallis X^2 statistic (p-value)	6.929 (0.031)**						
Pairwise Comparison: Wilcoxon z-statistic (p-value)	High vs. Medium		Medium vs. Low		High vs. Low		
	0.958 (0.338)		1.916 (0.055)*		2.629 (0.008)***		

***: Significant at $\alpha<0.01$; **: Significant at $\alpha<0.05$; *: Significant at $\alpha<0.10$

Results in Table 3 are based on unvariate tests, which ignore potential effects of other variables on the degree of earnings management. As an attempt to investigate if these results hold after controlling for other factors related to issuer characteristics and earnings management, we estimate the following regression model:

$$DAC_i = \beta_0 + \beta_1 OS_i + \beta_2 SG_{i(t-1)} + \beta_3 PREOP_{i(t-1)} + \beta_4 LEV_{i(t-1)} + \beta_5 RP_i + \epsilon \quad (2)$$

where,

DAC_i = discretionary accruals for ith firm in year t-1.

OS_i = natural logarithm of offer size for ith firm.

$SG_{i(t-1)}$ = sales growth for ith firm in year t-1.

$PREOP_{i(t-1)}$ = industry-adjusted operating return on assets for ith firm in year t-1.

$LEV_{i(t-1)}$ = debt to equity ratio for ith firm in year t-1.

RP_i = underwriter reputation for ith firm, measured by the rankings of Carter and Manaster (1990), and updated according to the information in Jay Ritter's website.

Our hypothesis 1 predicts that β_5 is negative since the issuers employing high-reputation underwriters are likely to have less earnings management.

Table 4 presents the results from estimating the regression model (2).[7] The results are essentially the same as those from univariate analyses. The regression coefficient of RP (β_5) has predicted sign (negative) and is statistically significant (α<0.10). Overall, these results lend strong support to our hypothesis that underwriter reputation is negatively related to pre-IPO earnings management, even after controlling for other variables.

Table 4: Effect of Underwriter Reputation on Pre-IPO Earnings Management: Regression Analysis[1]

$DAC_i = \beta_0 + \beta_1 OS_i + \beta_2 SG_{i(t-1)} + \beta_3 PREOP_{i(t-1)} + \beta_4 LEV_{i(t-1)} + \beta_5 RP_i + \epsilon$

Independent Variables	Coefficients (t-value)
Intercepts	0.989 (3.07)***
OS	-0.079 (1.12)
SG	-0.002 (0.88)
PREOP	0.311 (27.59)***
LEV	-0.089 (0.49)
RP	-0.073 (1.65)*
Adj. R^2	0.721

Table 4: Effect of Underwriter Reputation on Pre-IPO Earnings Management: Regression Analysis[1]

[1] DAC = discretionary accruals in year t-1.
OS = natural logarithm of offer size.
SG = sales growth in year t-1.
PREOP = industry-adjusted operating return on assets in year t-1.
LEV = debt to equity ratio in year t-1.
RP = underwriter reputation based on the rankings of Carter and Manaster (1990), and updated according to the information in Jay Ritter's website.

***: Significant at $\alpha<0.01$; **: Significant at $\alpha<0.05$; *: Significant at $\alpha<0.10$

Post-IPO operating performance and underwriter monitoring: Hypothesis 2

In order to examine the effect of underwriter reputation on post-IPO operating performance after controlling for pre-IPO earnings management and other factors, we estimate the following regression model:

$$POSTOP_i = \beta_0 + \beta_1 DAC_{i(t-1)} + \beta_2 SG_{i(t-1)} + \beta_3 PREOP_{i(t-1)} + \beta_4 AGE_{i(t-1)} + \beta_5 SD_i + \beta_6 RP_i + \epsilon \quad (3)$$

where,

$POSTOP_i$ = average industry-adjusted operating return on assets for ith firm between years t=1 and t=3.

$DAC_{i(t-1)}$ = discretionary accruals for ith firm in year t-1.

$SG_{i(t-1)}$ = sales growth for ith firm in year t-1.

$PREOP_{i(t-1)}$ = industry-adjusted operating return on assets for ith firm in year t-1.

$AGE_{i(t-1)}$ = age of ith firm in the year t-1.

SD_i = standard deviation of daily returns for ith firm from day 6 to day 255 after IPO.

RP_i = underwriter reputation for ith firm, measured by the rankings of Carter and Manaster (1990), and updated according to the information in Jay Ritter's website.

Since underwriters have incentives to continue providing monitoring services to the firms they take public, the issuers employing high-reputation underwriters with better monitoring capabilities are likely to have better operating performance after IPO. Hence, it is predicted that β_6 is positive.

Table 5 presents the results from estimating the regression model (3). First of all, the coefficient of DAC is positive but insignificant. This indicates that pre-IPO earnings management has no effect on post-IPO operating earnings. More importantly, the regression coefficient of RP (β_6) has predicted sign (positive) and is statistically significant (α<0.10). This result suggests that underwriter reputation is positively related to post-IPO operating earnings, even after controlling for other variables. This supports our hypothesis 2.

Table 5: Effect of Underwriter Reputation on Post-IPO Operating Earnings: Regression Analysis [1]

$$POSTOP_i = \beta_0 + \beta_1 DAC_{i(t-1)} + \beta_2 SG_{i(t-1)} + \beta_3 PREOP_{i(t-1)} + \beta_4 AGE_{i(t-1)} + \beta_5 SD_i + \beta_6 RP_i + \epsilon$$

Independent Variables	Coefficients (t-value)
Intercepts	0.0904 (1.22)
DAC	0.0112 (1.17)
SG	-0.0012 (2.29)**
PREOP	-0.0017 (0.59)
AGE	0.0014 (2.23)**
SD	-0.0123 (1.47)
RP	0.0156 (1.76)*
Adj. R^2	0.040

1 POSTOP = average industry-adjusted operating return on assets (operating income before taxes and depreciation divided by total assets) between years t=1 and t=3.
DAC = discretionary accruals in year t-1.
OS = natural logarithm of offer size.
SG = sales growth in year t-1.
PREOP = industry-adjusted operating return on assets in year t-1.
AGE = age of IPO firms (years).
SD = standard deviation of daily returns from day 6 to day 255 after IPO.
RP = underwriter reputation based on the rankings of Carter and Manaster (1990), and updated according to the information in Jay Ritter's website.

***: Significant at α<0.01; **: Significant at α<0.05; *: Significant at α<0.10

Robustness tests

IPO earnings management and the choice of the lead underwriter could be mutually related. IPO issuers with aggressive earnings management may deliberately avoid high-prestige underwriters

if they think the underwriters would monitor their accruals management. Likewise, high-prestige underwriters may also choose to avoid IPO issuers with aggressive earnings management given their reputation capital at stake.

To handle this potential endogeneity problem, we use an instrumental variable two-stage least squares (2SLS) regression approach. In the first stage, we estimate the following regression model:[8]

$$RP_i = \alpha_0 + \alpha_1 DAC_{i(t-1)} + \alpha_2 Ln(TA_{i(t-1)}) + \alpha_3 [Ln(TA_{i(t-1)})]^2 + \epsilon \qquad (4)$$

In the above models, RP is the actual reputation ranking of the underwriter. The regression coefficients from each model are then applied to our IPO sample to find the estimated reputation, ER, of each underwriter. We then estimate the following second stage regression model:

$$POSTOP_i = \beta_0 + \beta_1 DAC_{i(t-1)} + \beta_2 SG_{i(t-1)} + \beta_3 PREOP_{i(t-1)} + \beta_4 AGE_{i(t-1)} + \beta_5 SD_i + \beta_6 ER_i + \epsilon \qquad (5)$$

where, ER is the estimated reputation obtained using the estimates of model (4). Other variables are same as those used in model (3).

Table 6 presents the 2SLS regression results. The second column of Table 6 reports the results of estimating regression model (4). Firm size, as measured by total asset, has significantly positive relationship with underwriter reputation, indicating that larger firms tend to choose high-reputation underwriters. The fourth column of Table 6 presents the results of estimating the stage II regression model (5), which includes the instrumental variable ER. The results show that while the coefficient of SG (PREOP) is significantly negative (positive), the coefficient of DAC is insignificant. That is, with the endogeneity between IPO earnings management and the choice of the underwriter considered, pre-IPO accruals do not affect post-issue operating performance of IPO firms.

Most importantly, the coefficient of ER is positive and statistically significant ($\alpha<0.05$), which is consistent with the results from simple regression (3). This significantly positive relation between underwriter reputation and post-IPO operating performance implies that underwriters are not disheartened by the initial earnings management of IPO issuers. IPO underwriters keep themselves engaged in the affairs of their clients because of the lucrative business relationships. The monitoring that high-reputation underwriters continue to supply to the firms they take public is value-increasing. This finding supports our second hypothesis and is consistent with Stoughton and Zechner (1998) and Jain and Kini (1999).

Table 6: The Effect of Underwriter Reputation on Post-IPO Operating Performance: Two Stage Least Square (2SLS) Regression Analysis

Stage I: $RP_i = \alpha_0 + \alpha_1 DAC_{i(t-1)} + \alpha_2 Ln(TA_{i(t-1)}) + \alpha_3 [Ln(TA_{i(t-1)})]^2 + \epsilon$

Stage II: $POSTOP_i = \beta_0 + \beta_1 DAC_{i(t-1)} + \beta_2 SG_{i(t-1)} + \beta_3 PREOP_{i(t-1)} + \beta_4 AGE_{i(t-1)} + \beta_5 SD_i + \beta_6 ER_i + \epsilon$

Stage I Regression [1]		Stage II Regression [2]	
Variables	Coefficients	Variables	Coefficients
Intercept	6.0624***	Intercept	-0.5840*
DAC	-0.0239	DAC	-0.0000
Ln(TA)	0.7824***	SG	-0.0009**
$[Ln(TA)]^2$	-0.0525***	PREOP	0.0435*
		AGE	0.0004
		SD	0.0038
		ER	0.0799**
Adj. R^2	0.16	Adj. R^2	0.14

Stage I Regression:

RP = underwriter reputation.
DAC = discretionary accruals in the year t1
TA = total assets in the year t=-1.

Stage II Regression:

POSTOP = average industry-adjusted operating return on assets (operating income before taxes and depreciation divided by total assets) between years t=1 and t=3.
SG = sales growth in year t-1.
PREOP = industry-adjusted operating return on assets in year t-1.
AGE = age of IPO firms (years).
SD = standard deviation of daily returns from day 6 to day 255 after IPO.
ER = instrumental variable (estimated reputation of underwriter) from the first stage regression.

***: Significant at $\alpha<0.01$; **: Significant at $\alpha<0.05$; *: Significant at $\alpha<0.10$

In our sample, the high- and medium- reputation underwriter groups have observations several times that of the low-reputation underwriters. To avoid our results being driven by this factor, we apply a weighted least squares (WLS) approach to the instrumental variable two-stage regression model. The weight applied to each observation is equal to the inverse of the number of observations in each underwriter-reputation group. In this manner, each group receives equal weight in the estimation.

Table 7 presents the results of estimating regression model (4) and (5) using two-stage WLS regression approach. The results again show that underwriter reputation has significantly positive impact on the post-IPO operating performances of IPO issuers. However, the coefficient of DAC is again insignificant. This suggests that the presence of effective certification and monitoring by

underwriters has not only restrained the opportunistic initial earnings management, but also resulted in improvements of post-issue operating performance for IPO firms.

Table 7: The Effect of Underwriter Reputation on Post-IPO Operating Performance: Weighted Least Square (WLS) Regression Analysis

Stage I: $RP_i = \alpha_0 + \alpha_1 DAC_{i(t-1)} + \alpha_2 Ln(TA_{i(t-1)}) + \alpha_3 [Ln(TA_{i(t-1)})]^2 + \epsilon$

Stage II: $POSTOP_i = \beta_0 + \beta_1 DAC_{i(t-1)} + \beta_2 SG_{i(t-1)} + \beta_3 PREOP_{i(t-1)} + \beta_4 AGE_{i(t-1)} + \beta_5 SD_i + \beta_6 ER_i + \epsilon$

Stage I Regression [1]		Stage II Regression [2]	
Variables	Coefficients	Variables	Coefficients
Intercept	6.0624***	Intercept	-0.0007*
DAC	-0.0239	DAC	0.0023
Ln(TA)	0.7824***	SG	-0.0002
$[Ln(TA)]^2$	-0.0525***	PREOP	0.0011**
		AGE	0.0015
		SD	-0.0029
		ER	0.0148*
Adj. R^2	0.16	Adj. R^2	0.10

Stage I Regression:

RP = underwriter reputation.
DAC = discretionary accruals in the year t-1.
TA = total assets in the year t=-1.

Stage II Regression:

POSTOP = average industry-adjusted operating return on assets (operating income before taxes and depreciation divided by total assets) between years t=1 and t=3.
SG = sales growth in year t-1.
PREOP = industry-adjusted operating return on assets in year t-1.
AGE = age of IPO firms (years).
SD = standard deviation of daily returns from day 6 to day 255 after IPO.
ER = instrumental variable (estimated reputation of underwriter) from the first stage regression.

***: Significant at $\alpha<0.01$; **: Significant at $\alpha<0.05$; *: Significant at $\alpha<0.10$

CONCLUSION

The purpose of this study is to investigate the effects of underwriter reputation on IPO issuers' pre-issue earnings management and post-issue operating performance. We predict that the certification role played by underwriters has a restraining effect on opportunistic earnings management by IPO issuers. We also hypothesize that underwriter reputation is positively related

to post-issue operating performance of IPO firms based on the argument that underwriters have strong incentives to continue supplying monitoring to the firms they take public.

Using a sample of 369 IPOs between 1997 and 2002, we find the empirical results supporting our hypotheses. Specifically, our results can be summarized as follows. First, IPO issuers underwritten by high- and medium-reputation underwriters on average have discretionary accruals that are significantly less than those associated with low- reputation underwriters. Second, underwriter reputation is negatively related to pre-IPO earnings management, even after controlling for other variables. Third, underwriter reputation has positive impact on the issuers' post-IPO operating earnings, even after controlling for other variables. Finally, pre-issue earnings management is not related to post-issue operating performance for the IPO issuers

For robustness tests, we consider the possibility that IPO earnings management and the choice of the underwriter are endogenously determined. Using an instrumental variable two-stage least squares (2SLS) regression approach, we find the results that there is a positive relation between underwriter reputation and post-IPO operating performance. We also control for the unequal number of IPOs underwritten by each reputation-group by performing a weighted least squares regression. Our results remain the same.

ENDNOTES

[1] Another view of earnings management emphasizes the liabilities arising from false earnings signals. These include explicit legal expenses and implicit costs due to a damaged firm reputation. It is argued that the burdens impel stock issuers to signal validly. Thus investors are informed, but not deceived. Even if this view is correct, we argue that high-prestige underwriters will distance themselves from firms with aggressive earnings management because there would be undesirable effects if the underwritten firms are likely to keep reporting continuously declining performance when accruals revert in later reporting periods.

[2] A rational for the cut-off points used to classify underwriters is based on the mean (8.17) and median (9.10) rankings for our sample (see Table 2).

[3] Cross-sectional method is used because a time series approach is not possible for IPOs. The cross-sectional approach has an additional advantage in that it incorporates changes in accruals resulting from changes in economic conditions for the industry as a whole. Since the cross-sectional regression is re-estimated each year, specific year changes in economic conditions affecting expected accruals are filtered out. Moreover, the common practice by underwriters of comparing market prices and financial information of similar firms when pricing IPO equity further shows the importance of extracting industry-wide economic conditions from abnormal accruals.

[4] As additional measures of post-issue operating performance, we use the industry-adjusted operating cash flow return on assets and the industry-adjusted return on assets. The main results remain the same.

[5] Using average performance over three years rather than annual performance can smooth out temporal fluctuations due to distortions arising from accrual accounting by the IPO firm.

[6] These results are also are also consistent with the implication that either high-reputation underwriters have deliberately avoided IPO issuers with high pre-IPO discretionary accruals, or they tend to avoid each other.

[7] We also estimate the regression model (2) using RP as a categorical variable (i.e., assign 3, 2, 1 to high-, medium- and low-reputation group, respectively). The estimation results are qualitatively the same.

[8] We have also estimated underwriter reputation using two different models, which include additional variables (SD; SD and AGE). The results remain basically the same.

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ASSESSMENT OF INTERNAL AUDITING BY AUDIT COMMITTEES

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ABSTRACT

Audit committees, as part of their internal audit oversight role, assess the independence and work performance of the internal audit function. This paper analyzes these assessments by discussing applicable professional audit standards, corporate audit charters, and relevant research findings.

INTRODUCTION

Many companies have made large investments in internal auditing in recent years and they want to ensure that the internal audit function is adding value to their organizations. Corporate audit committees often have the main responsibility to determine whether internal audit is doing an effective job. One of the roles incumbent on audit committees in serving their company board of directors is to provide oversight of the internal audit function. For companies listed on the New York Stock Exchange, audit committees are required to assist the board of directors in its oversight of the performance of the company's internal audit function (NYSE 2004, § 303A.07(c)(i)(A)(4)). This oversight role entails, among other duties, assessing internal audit independence and the work performance of internal auditing. In assessing internal auditing, audit committees should be familiar with assessment criteria, sources of information, and assessment procedures. The objective of this paper is to assist audit committee members with these assessments by discussing applicable professional audit standards, corporate audit charters, and relevant research findings.

ASSESSING INTERNAL AUDIT INDEPENDENCE

Independence is a critical aspect of the internal audit function. Standards set forth by the Institute of Internal Auditors (IIA), *International Standards for the Professional Practice of Internal Auditing*, define internal auditing as an independent assurance function and require internal auditors to be independent from activities they audit (IIA 2003, Introduction, §1130.A1). Because internal auditors are employed by the organizations they audit, they cannot have the same level of independence as external auditors who, while paid by the organizations they audit, are not employed by them.

For internal auditors, independence is generally determined by who hires and fires the internal auditors, to whom the internal auditors report, and whether or not they provide assurance services for areas in which they have had, or will have, operational responsibility. For example, independence is enhanced when employment decisions involving the chief internal auditor are made by the audit committee rather than the controller and when internal auditors report to the audit committee rather than the controller. Independence is impaired when internal auditors audit an activity for which they recently had decision-making responsibility. This has been a particular concern since the enactment of Section 404 of the Sarbanes-Oxley Act of 2002, which has resulted in internal audit functions devoting more resources to evaluating and improving internal controls. A study by PricewaterhouseCoopers (2006) reveals that 56% of the 402 companies in their survey reported that during the first year of Sarbanes-Oxley compliance, internal audit staffs had overall responsibility of Section 404 project management. This decision-making responsibility can potentially impair the objectivity of those internal auditors.

A study of 150 companies by Carcello, Hermanson, & Neal (2002) revealed that 18% of audit committee charters discussed the audit committee's duty to assess the independence of the internal audit function. If that is an indication of the proportion of audit committees that actually do assess their internal audit department's independence, then it begs the question of why such a low rate. Perhaps most audit committees just rely on their external auditors to provide them with assessments of the internal audit department's independence. The following excerpt from Walt Disney Company's audit committee charter illustrates the committee's responsibility to assess internal audit independence:

> *"The Committee shall have responsibility for determining that the Management Audit department is effectively discharging its responsibilities. In carrying out this responsibility, the Committee shall:*
>
> .
>
> .
>
> .
>
> *review the appropriateness of the . . . operational independence of Management Audit (Walt Disney Company 2007)."*

PERFORMANCE REVIEWS OF INTERNAL AUDITING

Audit committees assess the performance of the internal audit function using both external and internal sources. The external sources include teams from the IIA, internal auditors from another company, and external providers of internal audit services such as Certified Public Accounting firms. The internal sources typically include senior corporate management and self assessments from the chief internal audit executive.

External Assessments

The IIA Standards state that external assessments of the internal audit function should be conducted once every five years, but that the potential need for more frequent external assessments should be discussed by the chief audit executive with the company's board of directors (IIA 2003, section 1312). "The scope of the review can range from a relatively narrow focus on the IIA Standards to a broad evaluation of the function in the context of all stakeholders' expectations and the practices employed by leading functions within other organizations (Dixon & Goodall 2007, 4)." These external assessments are used by board members, including the audit committee, "to confirm alignment of internal audit with their priorities and expectations, identify opportunities to significantly improve internal audit departments, and optimize the level of convergence of internal audit with other risk functions in the organization (Dixon & Goodall 2007, 3)."

Additionally, the IIA Standards indicate that qualifications and independence of the external reviewer or review team should be discussed by the chief audit executive with the board (IIA 2003, section 1312). "Whether the team consists of appropriately qualified individuals from the IIA, peer institutions, . . . , or a qualified external provider, it should have the ability to benchmark your internal audit department against other firms, both within and outside the industry (Dixon & Goodall 2007, 4)." When the external assessment of the internal audit function is completed, the chief audit executive should communicate the results to the board (IIA 2003, section 1320).

A survey of 358 companies by Verschoor (1992) reports that the proportion of audit committees that have reviewed an external evaluation of internal auditing during the previous two years ranged from 8% in corporations with a small internal audit staff to 26% in corporations with large internal audit staffs. A study of 717 companies by PricewaterhouseCoopers (2007) found that 33% of all respondents, and 58% of Fortune 500 respondents, reported having conducted external quality assurance reviews within the past five years. These findings suggest that audit committees need to be more proactive in arranging for external quality assurance reviews to be in compliance with IIA Standards.

The audit committee may also wish to obtain an external assessment about internal auditing directly from the company's external auditors. This would include not only the quality of the internal audit department, but also how well it coordinated with the external auditors and the degree of reliance placed on the internal audit work.

Internal Assessments

The audit committee should also be making its own evaluation of the internal audit function on an annual basis. This annual review may contain input from company management as well as a self-assessment from the head of internal audit. Sources for this evaluation could include:

- *The internal audit mission statement;*
- *Internal audit reports;*
- *Internal audit plan;*
- *Internal audit policy and procedure manuals;*
- *Internal audit programs;*
- *Internal audit working papers.*

Some audit committees do informal evaluations while others conduct formal, written documented appraisals (Protiviti Inc., 2004). A survey of 118 audit committee members by DeZoort (1997) found that they generally acknowledge their responsibility to review the effectiveness of the internal audit function and that this responsibility is generally stated in their companies' proxy statements. An analysis of 100 audit committee charters by Bailey (2007) reveals that 98% require audit committee review of the performance of the internal audit function. Some examples from audit committee charters appear in Table 1.

Table 1: Examples from Audit Committee Charters Requiring Audit Committee Review of the Performance of Internal Auditing

CVS Caremark Corporation
At least annually, the Audit Committee shall evaluate the performance of the senior officer or officers responsible for the internal audit function of the Company (CVS Caremark Corporation 2007).
General Mills
The Committee -- Reviews the performance of the internal audit function (General Mills 2007).
McDonald's Corp.
The Committee shall annually review the experience and qualifications of the senior members of the internal audit function and the quality control procedures of the internal auditors. As part of its responsibility to evaluate any internal audit service providers, the Committee shall review the quality control procedures applicable to the service providers. The Committee shall also obtain not less frequently than annually a report of the service providers addressing such service providers' internal control procedures, issues raised by their most recent internal quality control review or by any inquiry or investigation by governmental or professional authorities for the preceding five years and the response of the service providers (McDonald's Corporation 2007).
Pepsico
In addition to the purposes set forth above, the primary responsibilities of the Committee shall be to: . . . Review and approve the performance . . . of the Corporation's senior-most internal auditor (Pepsico 2007).

When assessing the internal audit function, audit committees should consider several issues. One issue deals with the degree to which internal auditors understand the company, its objectives, key processes, risks, and control environment. Another issue deals with evaluating the internal audit work plan, as well as the internal audit department's ability to implement and complete the planned work. A survey of 118 audit committee members by DeZoort (1997) revealed that reviewing internal audit plans is one of their assigned duties and it was generally identified as such in their companies' proxy statements. Carcello et al. (2002) found that 66% of the 150 companies they surveyed included in their audit committee charters a duty to review the internal audit plan and procedures. Bailey's (2007) analysis of audit committee charters indicated that 75% require the audit committee to review the internal audit plan. Examples from audit committee charters that mention these duties appear in Table 2.

Table 2: Examples from Audit Committee Charters Requiring Audit Committee Review of the Internal Audit Plan

AirTran Holdings, Inc
To fulfill its responsibilities and duties, the Audit Committee shall . . . Review the activity and effectiveness of the Internal Audit Group including the scope of the internal audit plan for the current year (AirTran Holdings 2007).
Chevron
The Committee shall review, based on the recommendation of the independent auditors and the General Manager–Corporation Auditing, the scope and plan of the work to be done by the Corporation Auditing Department, and the results of such work (Chevron 2007).
CVS Caremark Corporation
At least annually, the Audit Committee shall review the annual internal audit plan with the senior officer or officers responsible for the internal audit function of the Company. The review shall focus on the scope and effectiveness of internal audit activities and the department's capability to fulfill its objectives (CVS Caremark Corporation 2007).
Pepsico
In addition to the purposes set forth above, the primary responsibilities of the Committee shall be to . . . Review the audit plans and activities of the independent auditors and the internal auditors (Pepsico 2007).

Since internal audit's performance will depend greatly on its personnel, the audit committee should also assess the qualifications and training of current internal audit personnel as well as policies for acquiring and developing internal audit personnel in the future. Verschoor's (1992) survey of 358 corporations reports that in about 71% of the responding companies, audit committees review internal auditing staff qualifications. The quality, timeliness, and value of the output (i.e., internal audit reports) produced by the internal audit staff should also be scrutinized by the audit committee.

Protiviti Inc. (2004) suggests that audit committees' assessments of internal auditing include the following questions:

- *Has internal audit met the terms of its written charter?*
- *Is internal audit assisting the company in identifying and addressing its most significant risks?*
- *Is internal audit sufficiently objective in its mindset and approach?*
- *Are the internal auditors technically competent and proficient?*
- *Does internal audit have the necessary resources to address key risks and issues adequately and appropriately?*
- *Is internal audit led by a competent head that has the respect of company management, the audit committee, and the internal audit staff?*
- *Is internal audit efficient in its efforts, methods, and approach?*
- *Is internal audit adding value by helping to improve operations, and bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes?*

Some of these issues deal with assessing internal audit personnel (i.e., the third through sixth of these bulleted points), while the others involve internal audit activities. The former relate to the capabilities of the internal audit function, whereas the latter relate to the performance of the internal audit work. Regarding the last issue of adding value, a survey of 9,366 internal auditors by Burnaby, Abdolmohammadi, & Haas (2007) found that 67% of their organizations had formal measures for the value added by internal auditing. These measures include self-assessment and assessment by others in the organization, acceptance of internal audit's recommendations, client surveys, the number of management requests, and reliance by the external auditors on the internal audit activity.

The American Institute of Certified Public Accountants (2005) has also developed a list of questions for the audit committee to evaluate the performance of the internal audit function. Some are similar to the ones above suggested by Protiviti Inc. (2004), while others on the list include:

- *Are the department's size and structure adequate to meet its established objective?*
- *Is the experience level of the internal auditors adequate?*
- *Does the department have an appropriate continuing education program?*
- *Is the department's work planned appropriately?*
- *Are the internal audit reports issued on a timely basis?*
- *Do internal audit procedures encompass operational as well as financial areas?*
- *Does the internal audit team have a periodic peer review performed and, if so, what were the results of the latest review?*
- *What criteria are used to establish and prioritize the annual and long-range internal audit plan?*
- *To what extent does the internal audit team sign off on resolutions of management comments by outside independent auditors?*

These questions, as well as the ones suggested above by Protiviti Inc. (2004), are similar to the considerations whereby external auditors evaluate the competence, objectivity, and work performed by internal auditors when they rely on the work of internal auditing. These considerations are discussed in Statement on Auditing Standards No. 65, *The Auditors' Consideration of the Internal Audit Function in an Audit of Financial Statements* (AICPA, 1991).

CONCLUSION

Internal auditing's growth in recent years has resulted in an increased oversight role for corporate audit committees. Part of this oversight role involves assessing the independence and work performance of internal auditing by the audit committee. This paper has analyzed these assessments by discussing applicable professional audit standards, corporate audit charters, and relevant research findings. The research findings pertaining to audit committee charters suggest that while the vast majority of them require audit committees to review internal audit performance, only a small percentage mention assessing the critical attribute of internal audit independence. Between two-thirds and three-fourths of the audit committee charters require the audit committees to review the internal audit plan. While this certainly represents a majority of audit committees, a significant portion, nevertheless, appear to be deficient in this regard. This same conclusion can be stated about reviewing internal audit staff qualifications – over 70 percent of audit committees do so, but this still leaves a significant minority that do not. Finally, the research indicates that not many audit committees have done external reviews of their internal audit functions, as mandated by IIA standards. So, while it would appear that, in general, audit committees are meeting their regulatory requirements in assessing the internal audit function, there are still numerous audit committees that need to improve their internal audit oversight responsibilities. The discussions in this paper can hopefully assist both audit committee members and internal auditors in obtaining a better understanding of their corporate governance roles.

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THE QUALITY LEVEL OF CORPORATE ANNUAL REPORT AND COST OF CAPITAL: EVIDENCE FROM JAPANESE FIRMS

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ABSTRACT

Economic theories suggest that increasing the level of a firm's disclosures should reduce its cost of capital by reducing information asymmetry either between the firms and shareholders or between buyers and sellers of the firm's shares. This study examines the relationship between the quality of Japanese firms' annual reports and those firms' cost of capital. Corporate annual reports that received the Nikkei Annual Report Award were assumed to represent higher quality levels than those that were not selected by Nikkei. Our results show that the information asymmetry component of the cost of capital – namely, the relative bid-ask spread – is lower for awarded firms compared to non-awarded firms. These results accord with theories arguing that increased disclosures should lower a firm's cost of capital.

INTRODUCTION

Economic theories suggest that increasing corporate disclosures should lower a firm's cost of capital by reducing information asymmetry either between the firm and its shareholders or between buyers and sellers of the firm's shares. One group of theories that posits a link between a disclosures and cost of capital is based on the idea of an investor's estimation risk. Estimation risk stems from an investor's uncertainty about the distribution of a security's return. Since the investor's uncertainty depends on the level of available information, his or her estimation risk is higher for firms with less available information than it is for firms with more available information. Thus, to offset his or her high estimation risk, an investor requires high rate of return, which, in turn, translates into high cost of capital for a firm. In short, increased disclosures reduce cost of capital by reducing an investor's estimation risk (Klein and Bawa, 1976; Barry and Brown, 1985; Coles and Loewenstein, 1988).

Another group of theories argues that increasing corporate disclosures should reduce a firm's cost of capital by reducing transaction cost and/or increasing market liquidity of a firm's share. Costs incurred by adverse selection stemming from information asymmetry are impounded into transactions between buyers and sellers of firm's shares. Market illiquidity arising from the decrease in investors' demands for stocks with high transaction costs translates into a higher cost of capital

for a firm; that firm must issue capital at a discount to overcome the reluctance of investors to hold its shares. Thus, revealing information to reduce adverse selection can reduce cost of capital (Amihud and Mendelson, 1986; Amihud and Mendelson, 1988; Diamond and Verrecchia, 1991). Recent theories which link market liquidity to the idea of information intermediation and informational differences among investors suggest that increasing disclosures should lower cost of capital by increasing information intermediation and reducing informational differences. First, increasing disclosures should also increase analysts' supplies (i.e., numbers of analysts following a firm) because of their lower cost of information acquisition. Increased analysts' supplies in turn reduce informational differences among investors (Lang and Lundholm, 1996). Second, reduced informational differences among investors should lower cost of capital of a firm. Since uninformed or less-informed investors are less willing to trade and require additional compensations for expected losses from transacting with privately informed or better-informed investors, cost of capital is higher for firms with larger proportion of private information. Consequently, if private information is more widely dispersed, cost of capital is reduced because of the increased demands of informed and uninformed investors (i.e., increased liquidity of a firm's shares) and because of the reduced additional compensations of uninformed investors (Easley and O'hara, 2004).

Although these theories are fascinating, consensus has not been reached. Empirical studies among academic researchers seem to yield mixed results depending on the disclosure metric and research design employed. First, measuring a firm's cost of capital poses many difficulties. One group of empirical studies, hereafter referred to as the direct approach, attempts to study the link by explicitly measuring cost of capital with existing methods. Since estimating cost of capital is difficult, the researchers' abilities to successfully measure cost of capital may determine success or failure in documenting its association with a firm's disclosures (Botosan, 2006). In addition, among the five most popular methods of estimating cost of capital, there are only two methods producing reliable cost of capital estimates (Botosan and Plumlee, 2005). Another group of empirical studies, hereafter referred to as the indirect approach, attempts to study the link by employing an information asymmetry component of the cost of capital to bypass the difficulty in estimating cost of capital. These studies, however, face another problem since information asymmetry is not directly observable. While a number of proxies (e.g., bid-ask spread, trading volume, share price volatility, etc.) have been used for information asymmetry, each proxy has its limitation.

Apart from the difficulty in estimating cost of capital or an information asymmetry component of the cost of capital, measuring a level of firm's disclosure poses another challenge because of the difficulty in measuring the extent of disclosures. While academic researchers employ several proxies (e.g., ratings from organizations, self-constructed measures, etc.) for disclosure, each proxy has its limitation (Healy and Palepu, 2001). In addition, there might be other avenues of disclosures omitted in the analysis that may produce a correlated omitted variable bias. Finally, while theoretical studies suggest that greater levels of a firm's disclosures should reduce the firm's cost of capital, early empirical study reveals that certain types of disclosures might have the opposite effect. It is documented, for example, that cost of capital unexpectedly increases with the level of

timely disclosure and does not correlate with the level of investor relations activities (Botosan and Plumlee, 2002).

This paper investigates whether firms that produce high quality annual reports experience less information asymmetry than those that produce low quality annual reports. *Nihon Keizai Shimbun (Nikkei)*, Japan's leading business newspaper and the creator of the Nikkei 225 stock market index, has published its list of the Nikkei Annual Report Awards since 1998. The awards encourage Japanese firms to provide investors with high quality, informative annual reports in order to reduce information asymmetry between firms and shareholders and thus facilitate shareholder decision-making. Each year, a special advertising supplement on the annual reports of firms participating in the contests is published in both *The Nikkei Financial Daily* and the English language *Nikkei Weekly*. The annual reports of the participating firms are carefully examined and evaluated by investment professionals, including representatives of institutional investors and analysts as shown in Appendix 1. Corporate annual reports of firms selected by the Nikkei Annual Report Award committee are believed to represent higher quality levels than those of firms not selected by Nikkei. This suggests that awarded firms should experience less information asymmetry and should benefit from the resulting lower cost of capital as compared to non-awarded firms.

In this study, we analyze the relationship between the quality of firms' annual reports and the information asymmetry component of the firms' cost of capital – namely, the relative bid-ask spreads between awarded firms and non-awarded firms. Extant literature provides a variety of proxies for the information asymmetry component of the cost of capital such as bid-ask spread, trading volume, and stock return volatility. Among these proxies, bid-ask spread is generally thought to measure information asymmetry more explicitly (Leuz and Verrecchia, 2000). Less information asymmetry arising from increased disclosure means less adverse selection which implies lower relative bid-ask spread. Since most of the Japanese firms close their accounting books at the end of March and file their financial reports in early June (i.e., within three months subsequent to balance sheet date), we measure the firms' relative bid-ask spreads from the period after they submit their financial reports filings and investigate whether bid-ask spreads are lower for awarded-firms compared to non-awarded firms. After controlling for firm characteristics and other determinants of relative bid-ask spread, and conducting additional checks to ensure robustness of the result, we found that awarded firms experience lower relative bid-ask spreads compared to those of non-awarded firms. Our data suggest that firms with high quality annual reports enjoy a lower information asymmetry component of their cost of capital than do firms with low quality annual reports.

PRIOR EMPIRICAL STUDIES

Botosan (1997) investigates the relationship between her self-constructed annual report disclosure scores and estimated cost of equity capital. In her study, Botosan finds that greater disclosure is associated with lower cost of equity capital for firms with low analyst followings.

However, she documents no statistical relationship between disclosure and estimated cost of capital for firms with high analyst followings. In addition, Botosan and Plumlee (2002) find that cost of equity capital decreases with the level of annual report disclosure but unexpectedly increases with the level of timely disclosure. Furthermore, they document no association between cost of equity capital and the level of investor relations activities. Hail (2002) studies the relationship between the amount of Swiss firms' voluntary disclosures in their annual reports and the firms' implied cost of capital. Hail documents a negatively significant association after controlling for other potentially influential variables such as risk characteristics and firm size.

Dhaliwal et al. (1979) examine the impact that the segment disclosure requirement by the Securities and Exchange Commission's (SEC) had on total risk and non-diversifiable risk. Their sample consists of firms affected and unaffected by the SEC decision. They show that the total risk of affected firms decreases compared to a sample of unaffected firms; however, their results were mixed with regard to non-diversifiable risk. In addition, Prodhan and Harris (1989) investigate the impact of the adoption of SFAS No. 14: Financial Reporting for Segments of a Business Enterprise on systematic risk. Their sample consists of firms affected and unaffected by the standard. In contrast to the findings of Dhaliwal et al., they reveal that, compared to a sample of unaffected firms, non-diversifiable risk decreases for affected firms.

Greenstein and Sami (1994) examine the impact of the SEC's segment disclosure requirement on relative bid-ask spread. Greenstein and Sami find that firms involving in segment disclosure (affected firms) exhibit lower relative bid-ask spread compared to their counterparts (unaffected firms). Welker (1995), examining the association between disclosure policy and liquidity in equity market, documents a significant and negative association between analysts' rating of a firm's disclosure and its bid-ask spread. Healy et al. (1999) document a decrease in relative bid-ask spread for firms with a large and sustained increase in their AIMR disclosure scores. Leuz and Verrecchia (2000) investigate whether the information asymmetry component of the cost of capital declines for German firms which voluntarily choose a higher standard of disclosure by either adopting United States generally accepted accounting principles (US GAAP) or International Accounting Standards (IAS). Leuz and Verrecchia employ relative bid-ask spread, share turnover, and stock return volatility as proxies for the information asymmetry component of the cost of capital in their analysis. They find that the relative bid-ask spread decreases and share turnover increases for firms voluntarily adopting either US GAAP or IAS, compared to firms adopting German GAAP. However, they find no significant decrease in stock return volatility for US GAAP- or IAS-adopting firms relative to non-adopting firms. Petersen and Plenborg (2006) study the association between voluntary disclosure and the information asymmetry component of the cost of capital for Danish firms. They document the fact that bid-ask spread decreases and share turnover increases according to the level of voluntary disclosure. Sami and Zhou (2008) investigate whether information asymmetry decreases for Chinese firms that cross-list their shares. They argue that firms that cross-list their shares on the Hong Kong Stock Exchange are subjected to more stringent disclosure requirements compared to firms that do not cross-list their shares. Cross-listed firms are, therefore,

expected to disclose more information than do non-cross-listed firms. They show that cross-listed firms have lower relative bid-ask spreads than do non-cross-listed firms.

RESEARCH DESIGN

Hypothesis Development

In this study, we employ relative bid-ask spread as a proxy for the information asymmetry component of a firm's cost of capital. We hypothesize that Nikkei awardees exhibit lower relative bid-ask spreads compared to the spreads of non-awardees. Therefore, we state the following hypothesis in an alternative form:

Hypothesis: *Compared to a sample of non-awarded firms, relative bid-ask spread is lower for a sample of awarded firms.*

Regression Model

Many determinants of a firm's disclosures are identified in the extant literature. A firm's level of disclosure has been documented to be positively associated with its size and financing needs (Lang and Lundholm, 1993). Ahmed and Courtis (1999), conducting a meta-analysis of the association between a firm's characteristics and its annual report disclosures, reveal that a firm's size is significantly associated with its disclosures. With respect to a firm's financing needs, Botosan (1997) documents a statistically significant and positive relationship between disclosure and financial leverage. Finally, firms may increase their disclosure when they perform well. Lang and Lundholm (1993) show that firms with high disclosure ratings are likely to show high contemporaneous earning performance.

With regard to the information asymmetry component of the cost of capital (i.e., bid-ask spread), first, existing research also suggests that firm size is negatively associated with bid-ask spread (Leuz and Verrecchia, 2000). The three-factor model of Fama and French (1995) also argues that firm size is an additional risk factor affecting cost of capital. Second, large shareholders are generally thought to have superior access to information about the firm, suggesting a relationship between share percentage and information asymmetry. For example, Chiang and Venkatesh (1988) show that presence of insiders is positively associated with relative bid-ask spread. Leuz and Verrecchia (2000), using free float as an inverse proxy for the presence of insiders, document a negative association between free float and bid-ask spread. Third, prior studies document a significantly positive association between stock price volatility and relative bid-ask spread. For instance, Stoll (1978), theorizing a positive relationship between bid-ask spread and stock riskiness, empirically documents a positive association as expected. Finally, prior studies also suggest that

trading volume is negatively associated with bid-ask spread. Firms with higher trading volume tend to have lower bid-ask spread (Mohd, 2005).

Following extant literature, we employ a firm's market capitalization (MV), percentage of share free float (FLOAT), standard deviation of stock price (SPV), and share turnover (VOLUME) as control variables in the analysis to proxy for firm size, inverse presence of insiders, stock price volatility, and trading volume, respectively. We therefore propose the following regression model using OLS including relative bid-ask spread (SPREAD) as a dependent variable, whether or not firms receive Nikkei awards (AWARD) as a binary variable as well as the above-mentioned determinants as control variables.

$$\log(SPREAD_i) = \beta_0 + \beta_1 AWARD_i + \beta_2 \log(MV_i) + \beta_3 \log(VOLUME_i) + \beta_4 \log(FLOAT_i) + \beta_5 \log(SPV_i) + \epsilon_i \quad (1)$$

where log(.) = natural logarithm of a variable,

$SPREAD_i$ = arithmetic average of daily relative bid-ask spread defined as daily absolute bid-ask spread scaled by daily average of bid price and ask price of a firm i in a sample from June 01, 2008 to December 31, 2008,

$AWARD_i$ = binary variable indicating whether a firm i is an awarded firm (AWARD = 1 for awarded firms, 0 otherwise),

MV_i = arithmetic average of a daily firm's market equity value of a firm i in a sample from June 01, 2008 to December 31, 2008,

$VOLUME_i$ = arithmetic average of daily share turnover defined as the daily trading value scaled by daily market equity value of a firm i in a sample from June 01, 2008 to December 31, 2008,

$FLOAT_i$ = percentage of total numbers of share outstanding of a firm i in a sample that is available for trading by the investing public and is not held for strategic goals in the fiscal year ending on December 31, 2007, and

SPV_i = standard deviation of daily closing share price of firm i in a sample from June 01, 2008 to December 31, 2008.

Sample Selection and Data Sources

A special feature on the 11th Nikkei Annual Report Awards 2008 was published in both Nikkei Financial Daily and the English language Nikkei Weekly newspaper in January, 2009. It announced the winners of awards for high quality 2008 fiscal year annual reports covering the period from April 1, 2007 to March 31, 2008. Nikkei's Annual Report Award's selection process first identifies the top 15 annual reports in terms of total scores. In the second stage, the 15 annual reports are further examined, and some are chosen as Grand Award, Excellent Award, and Award recipients.

Annual reports of the firms that fail to reach the second stages but earn 77 or more points on a scale of 100 points are designated as excellent but do not receive awards. In the 11th Nikkei Annual Reports Award competition, 30 firms were selected. Of the 30 firms, 1 firm received a Grand Award, 2 firms received Excellent awards, 12 firms received Awards, and the remaining 15 firms were designated as excellent but were not granted awards. Appendix B lists the selected firms. All 30 firms were matched by other firms listed on the same stock exchange and within the same section (i.e., the first selection of the Tokyo stock exchange). A pair which is matched by the Industry Classification Benchmark (ICB) code and 2006 financial year operating revenue closest for each of the 30 firms is obtained from the *OSIRIS* database. Data of the final 60 sample firms required for analysis are obtained from *Thomson Datastream*.

RESULTS OF CROSS-SECTIONAL ANALYSIS

Panel A in Table 1 presents descriptive statistics for the dependent variable. The results show that awarded firms exhibit lower relative bid-ask spread than do non-awarded firms. The difference in the mean (median) across the two groups is highly significant using a one-tailed t-test (Mann-Whitney-Wilcoxon test). However, this univariate result should be interpreted cautiously since firm characteristics and other determinants are not taken into account. Panel B in Table 1 exhibits descriptive statistics for firm characteristics and other determinants of spread. It shows that awarded firms, on average, have larger market equity value, higher share turnover, more widely held shares, and less price volatility than do non-awarded firms. These differences in medians of firm size and share turnover across the two groups are statistically significant as indicated by a Mann-Whitney-Wilcoxon test.

Table 1: Descriptive statistics for regression variables including differences in means and medians for awarded and non-awarded firms

Panel A: Dependent Variable							
Variable	Membership	Number	Mean	Median	Min	Max	Std. Dev.
Bid-Ask spread: SPREAD	If AWARD=0	30	0.00501	0.00457	0.00304	0.00866	0.00171
	If AWARD =1	30	0.00380***	0.00368***	0.00241	0.00746	0.00116
	All	60	0.0044	0.00387	0.00241	0.00866	0.00157
Panel B: Firm Characteristics and other determinants							
Variable	Membership	Number	Mean	Median	Min	Max	Std. Dev.
Size: MV	If AWARD=0	30	1099281	367104.8	12302.95	7322255	1721472
	If AWARD =1	30	1682855	884052.8***	184982.8	14541292	2666612
	All	60	1391068	576014.2	12302.95	14541292	2244627

Table 1: Descriptive statistics for regression variables including differences in means and medians for awarded and non-awarded firms

Share Turnover: VOLUME	If AWARD=0	30	0.00557	0.00438	0.00013	0.01794	0.00388
	If AWARD =1	30	0.01949	0.00642*	0.00010	0.38387	0.06893
	All	60	0.01253	0.00602	0.00010	0.38387	0.04891
Free Float: FLOAT	If AWARD=0	30	79.60	88	40	100	20.75
	If AWARD =1	30	84.50	90.5	40	100	17.53
	All	60	82.05	88.5	40	100	19.20
Price Volatility: SPV	If AWARD=0	30	6276.04	211.73	63.34	148245.50	27109.64
	If AWARD =1	30	3421.93	439.45	128.78	46881.52	11330.35
	All	60	4848.99	366.42	63.34	148245.50	20649.69

Notes: Asterisks indicates that the means (medians) of the two groups are significantly different using a one-tailed *t*-test (Mann-Whitney-Wilcoxon test) : * $0.05<p\leq0.1$, ** $0.01<p\leq0.05$ and *** $p\leq0.01$

Table 2: Cross-sectional regression result

$$\log(SPREAD_i) = \beta_0 + \beta_1 AWARD_i + \beta_2 \log(MV_i) + \beta_3 \log(VOLUME_i) + \beta_4 \log(FLOAT_i) + \beta_5 \log(SPV_i) + \epsilon_i$$

Variable	Coefficient	Std. Error	*t*-Statistics-	*p*-values
Constant	-5.31112***	0.635527	-8.36	0.000
AWARD	-0.15410**	0.068631	-2.25	0.029
log(MV)	-0.09590***	0.029562	-3.24	0.002
log(VOLUME)	-0.09115***	0.028889	-3.16	0.003
log(FLOAT)	0.12615	0.130945	0.96	0.340
log(SPV)	0.02405	0.023361	1.03	0.308
N	60			
R^2	0.4645	F- Statistics	9.37	
Adjusted R^2	0.4150	Prob. (F-Statistics)	0.0000	

Notes: log(.) stands for the natural logarithm. Asterisks indicates that the coefficients are significantly different from zero: * $0.05<p\leq0.1$, ** $0.01<p\leq0.05$ and *** $p\leq0.01$

Table 2 shows the result from regression analysis of Equation (1). The overall model is highly significant. The coefficient of annual reporting's quality (AWARD), which is our variable of interest, is, as expected, negative and statistically significant. All coefficients of other variables have the expected signs except for the coefficient of the percentage of share free float (FLOAT). However, its unexpected sign is of no great concern since its coefficient is not statistically

significant. In conclusion, our data, after controlling for firm characteristics and other determinants of bid-ask spread, indicate that awarded firms enjoy lower relative bid-ask spread relative to non-awarded firms.

ROBUSTNESS OF THE RESULTS

The results of OLS estimators of our cross-sectional regression analysis are sensitive to a number of factors such as regression assumptions, regression specification, and endogeneity.

Regression Assumption

First, we examine the normality of the regression's residuals. The results of both the Shapiro-Wilk W test and Skewness/Kurtosis tests of unstandardized residuals (p-value = 0.58695 for Shapiro-Wilk W test and p-value = 0.6588 for Skewness/Kurtosis tests) do not show any significance, suggesting that the distribution of residuals is approximately normal.

Second, multicollinearity among explanatory variables makes the estimation of regression coefficients difficult and the standard errors of the coefficients large. Myers (1990) suggests that an individual variance inflation factor (VIF) value of 10 causes a concern of multicollinearity among individual regressors. In our sample, no variance inflation factor (VIF) value of any explanatory variable is greater than 1.62, suggesting multicollinearity is unlikely to be a problem.

Finally, empirical studies employing regression analysis of cross-sectional data often face the problem of heteroscedasticity of the error terms. While estimation from OLS regression under heteroscedasticity is still unbiased and consistent, it is no longer efficient. In other words, OLS estimators are not Best Linear Unbiased Estimators (BLUEs), which calls into question the reliability of statistical inference (Gujarati, 2003, p. 427). The results of testing the regression's residuals for heteroscedasticity using the Breusch-Pagan and Cook-Weisberg methods do not show any significance (p-value = 0.3701), and thus it suggests that heteroscedasticity is unlikely to be a problem in the case at hand.

Regression Specification

As mentioned above, firm performance and financial leverage are determinants of the firm's disclosure level. Excluding these factors from the bid-ask spread model [Equation (1)] causes unbiased OLS estimators if firm performance and financial leverage are also determinants of the bid-ask spread. A few prior studies also include firm performance and financial leverage as control variables by arguing that they may also be correlated with bid-ask spread. However, there is little theoretical support for either firm performance or financial leverage having a direct effect on bid-ask spread. For instance, Petersen and Plenborg (2006), including firm performance and financial

leverage as control variables in a bid-ask spread model, document no statistical relationships for pooled samples.

We included firm performance and financial leverage as additional control variables and re-estimated the regression. Firm performance is proxied by a return on invested capital of a firm (ROIC) in the fiscal year ending on December 31, 2007, and financial leverage is proxied by a firm's financial leverage (LEV) defined as a ratio of long-term debt to its total assets in the fiscal year ending on December 31, 2007. The results, shown in Table 3, reveal that the coefficients are not statistically different from zero and so justify the exclusion of ROIC and LEV. The conclusion of the study remains the same even if ROIC and LEV are included as additional control variables.

Table 3: Cross-sectional regression result including ROIC and LEV as additional control variables

$$\log(SPREAD_i) = \beta_0 + \beta_1 AWARD_i + \beta_2 \log(MV_i) + \beta_3 ROIC_i + \beta_4 LEV_i + \beta_5 \log(VOLUME_i) + \beta_6 \log(FLOAT_i) + \beta_7 \log(SPV_i) + \epsilon_i$$

Variable	Coefficient	Std. Error	*t*-Statistics	*p*-values
Constant	-5.36037***	0.659031	-8.13	0.000
AWARD	-0.14568**	0.069900	-2.08	0.042
log(MV)	-0.09385***	0.029960	-3.13	0.003
ROIC	0.00615	0.008549	0.72	0.475
LEV	0.26128	0.295462	0.88	0.381
log(VOLUME)	-0.10625***	0.033753	-3.15	0.003
log(FLOAT)	0.1058	0.137617	0.77	0.445
log(SPV)	0.0138	0.025947	0.53	0.597
N	60			
R^2	0.4737	F- Statistics	6.69	
Adjusted R^2	0.4029	Prob. (F-Statistics)	0.0000	

Notes: log(.) stands for the natural logarithm. Asterisks indicates that the coefficients are significantly different from zero: * $0.05<p\leq0.1$, ** $0.01<p\leq0.05$ and *** $p\leq0.01$

Finally, a potential issue related to using relative bid-ask spread is that a change in the relative spread reflects a change in the absolute spread (the nominator) or price (denominator). It is noted that the relative spread moves inversely with price. Thus, a decrease in relative spread may simply reflect an increase in stock price. To address this problem, we re-estimate the model [Equation (1)] by including the natural logarithm of average share price of a firm for the period in which relative bid-ask spread is computed as an additional control variable. The result (not provided) shows that the coefficient of price is negative, as expected, but not statistically significant. In short, our conclusion is not materially changed and our binary AWARD variable remains negative and significant.

Endogeneity of Trading Volume

Our concern when we analyze the association between the quality level of a firm's annual report and its bid-ask spread using trading volume (VOLUME) as one of the additional control variables is that VOLUME may not be treated as an exogenous variable in the bid-ask spread model [Equation (1)]. Firms with higher trading volume tend to have lower bid-ask spread. Conversely, firms with higher bid-ask spread have lower trading volume (Mohd, 2005). The feedback effect of bid-ask spread on trading volume suggests that trading volume is an endogenous variable and so correlated with the error terms. Solving the problem of correlation between trading volume (VOLUME) and error term (ϵ) entails finding instrumental variables which are highly correlated with VOLUME but not correlated with bid-ask spread (SPREAD). Trading Unit (UNIT) defined as the minimum number of units of shares required for each transaction for each firm is employed as the instrumental variable for VOLUME. While UNIT is correlated with VOLUME, it is not correlated with SPREAD (correlation coefficient between SPREAD and UNIT is not statistically significant, p-value = 0.3680); thus, there is no feedback effect.

In addition to trading unit, a firm's number of shares outstanding has a direct effect on trading volume (Bushee et al., 2003). A firm's number of shares outstanding (SHARES) is the arithmetical average of the daily number of a firm's shares outstanding in the sample from June 01, 2008 to December 31, 2008. To ensure SHARES is uncorrelated with SPREAD, we find its correlation is not statistically significant (p-value = 0.2386). We, therefore, employ the two-stage least squares regression (2SLS) procedure to produce a consistent OLS estimator by estimating the regression model of trading volume on trading unit, a firm's number of shares outstanding, firm characteristics and other determinants, and then using the predicted value of trading volume from the first-stage regression as a replacement of VOLUME in Equation (1) for OLS estimation. Residuals in the second-stage regression are corrected to ensure the proper estimation of standard errors for correct statistical inference (Baum, 2006, p. 189).

Panel A in Table 4 shows the result of first-stage regression. The coefficients of trading unit (UNIT) and firm's number of shares outstanding (SHARES) are highly and statistically significant, confirming their correlation with trading volume (VOLUME). To ensure that these instruments for VOLUME are appropriately uncorrelated with the error terms, we additionally compute the test for over-identifying restrictions. The results of both the Sargan and Basmann tests do not reject the null hypothesis that the instruments are uncorrelated with the error terms (i.e., p-value = 0.4072 for Sargen test and p-value = 0.4333 for Basmann test), and suggest that the choice of instruments is appropriate. Panel B in Table 4 shows the result of the second-stage regression using the predicted value of trading volume in the first-stage regression in Panel A as a replacement for trading volume (VOLUME) in Equation (1). The coefficient of AWARD, which is our coefficient of interest, remains statistically and significantly different from zero and thus conforms to the earlier documented results.

Table 4: Two-stage least square regression accounting for endogeneity of trading volume.

Panel A: First Stage Regression

$VOLUME_i = \beta_0 + \beta_1 AWARD_i + \beta_2 \log(MV_i) + \beta_3 \log(FLOAT_i) + \beta_4 \log(SPV_i) + \beta_5 \log(SHARES_i) + \beta_6 UNIT_i + u_i$

Variable	Coefficient	Std. Error	*t*-Statistics	*p*-values
Constant	0.06039	0.074613	0.81	0.422
AWARD	0.01016	0.008789	1.16	0.253
log(MV)	0.04541***	0.005423	8.37	0.000
log(FLOAT)	0.03890**	0.016191	2.40	0.020
log(SPV)	-0.04409***	0.005469	-8.06	0.000
log(SHARES)	-0.04557***	0.004695	-9.71	0.000
UNIT	0.00003**	0.000012	2.19	0.033
N	60			
R^2	0.6586	F- Statistics	17.04	
Adjusted R^2	0.6199	Prob. (F-Statistics)	0.0000	

Panel B: Second Stage Regression

$\log(SPREAD_i) = \beta_0 + \beta_1 AWARD_i + \beta_2 \log(MV_i) + \beta_3 PVOLUME_{i1} + \beta_4 \log(FLOAT_i) + \beta_5 \log(SPV_i) + \epsilon_i$

Variable	Coefficient	Std. Error	*Z*-Statistics	*p*-values
Constant	-4.52795***	0.605773	-7.47	0.000
AWARD	-0.16031**	0.071102	-2.25	0.024
log(MV)	-0.12309***	0.029244	-4.21	0.000
PVOLUME	-0.30448	0.871415	-0.35	0.727
log(FLOAT)	0.12788	0.135537	0.94	0.345
log(SPV)	0.03452	0.02383	1.45	0.147
N	60	Ward Chi2- Statistics	34.85	
R^2	0.3680	Prob. (Wald Chi2)	0.0000	

Notes:[1] PVOLUME is a predicted value of first stage regression. Asterisks indicates that the coefficients are significantly different from zero: * $0.05<p\leq0.1$, ** $0.01<p\leq0.05$ and *** $p\leq0.01$

Event Study

Our quality level of annual report variable (AWARD) may be broadly interpreted as a proxy for the firm's overall quality of disclosures. Awarded firms are widely thought to have overall higher quality levels of disclosures than non-awarded firms. Our results simply document the benefits of increased quality levels of disclosures. However, our cross-selection analysis provides limited evidence on the marginal effect of the quality of annual reports per se. Since the extent of the firms'

involvements in their disclosure activities generally depends on their disclosure policies, which usually are consistent over time, the market participants may be able to differentiate between lower quality and higher quality firms. It is, therefore, unclear whether firms with low or high relative bid-ask spreads already had spreads in those ranges. That is, the external indication of quality of annual reports may not provide any new information to the market.

We investigated this issue by examining the changes of the firms' relative bid-ask spreads around its annual reports' filings and investigating whether those changes were different between awarded firms and non-awarded firms. We also examined whether firms' relative bid-ask spreads decrease following the increases in the qualities of those firms' annual reports. First, we analyzed firms' relative bid-ask spreads in the period before and after the filing of its annual reports. The pre-filing period can potentially create asymmetry in the information sets of market participants, thus increasing the adverse selection component of the bid-ask spread. For example, uninformed or less-informed investors lowers (increases) the price at which he is willing to buy (sell) to protect against the losses from transacting with informed or better informed investors who have advanced price-sensitive information. Thus, we investigated whether relative bid-ask spread in the post-filing period decreased relative to its value in pre-filing period for both awarded firms and non-awarded firms. Therefore, if the qualities of firms' annual reports provide external indication to the market, we hypothesize that (1) firms should enjoy reductions in its relative bid-ask spread following the filing of its annual reports and (2) firms with higher quality annual reports (i.e., awarded firms) should experience more reductions in the relative bid-ask spread than do firms with low quality annual reports (i.e., non-awarded firms) following those reports' filing. The pre-filing period (pre-event period) is from April 1, 2008 to May 30, 2008, the period between the time when firms close their accountings books and when they file their annual reports. Since most Japanese firms file their annual reports within the first week of June, we define the period from June 01, 2008 to June 07, 2008 as the event period. Finally, the post-filing period (post-event period) is from June 08, 2008 to July, 31, 2008. Relative bid-ask spreads were computed for pre-filing and post-filing period for both awarded and non-awarded firms. To facilitate a comparison across firms, we computed spread ratio, defined as the arithmetical average of a firm's daily relative bid-ask spread in the post-filing period divided by the arithmetical average of a firm's daily relative bid-ask spread in the pre-filing period. The results, shown in Panel A of Table 5, indicate that awarded firms experience reductions in relative bid-ask spreads in the post-filing period relative to its relative bid-ask spreads in the pre-filing period (i.e., spread ratio is below one). The mean of spread ratios is significantly below one using a one-tailed t-test. Non-awarded firms, on the other hand, experience increases in relative bid-ask spread in the post-filing period relative to its relative bid-ask spread in the pre-filing period (i.e., spread ratio is above one). Thus, the mean of spread ratios is not significantly below one. In addition, the mean of spread ratios of awarded firms is significantly lower than that of non-awarded firms (p-value = 0.0255) using a one-tailed t-test. In short, following the filing of firms' annual reports, awarded firms, on average, enjoy 6.5% reductions in its relative bid-ask spreads while non-awarded firms, on average, experience 1.4 % increases in its relative bid-ask spreads. These results

support our above hypotheses and thus suggest that the quality of a firm's annual report provides external indication to the market.

In addition to examining the change in relative bid-ask spread around the filing of annual reports, we also investigated whether relative bid-ask spread in the post-filing period (i.e., from June 08, 2008 to July 31, 2008) changed for firms with increased qualities of its annual reports compared to relative bid-ask spread for those firms in the same periods in the previous year. We used the same months to control for seasonal patterns. Thus, we investigated whether relative bid-ask spread changed for firms that experienced increases in their rankings in the 11th Nikkei Annual Report Awards compared to their rankings in the 10th Nikkei Annual Reports Awards. Increases in firms' rankings are believed to represent increases in its reporting's qualities. Of the 4 firms enjoying increases in their rankings, 2 firms were promoted from excellent to award winners; 1 firm was promoted from excellent to excellent award winner; and another firm was promoted from award winner to grand award winner. To account for market-wide changes in the bid-ask spreads across time, we computed market index-adjusted spread. For each of the post-filing period, the average of the daily relative bid-ask spread of each of the 4 firm in a sample is scaled by the contemporaneous average of the daily relative bid-ask spreads of all 225 firms that are constituents of the Nikkei 225 stock average index. To facilitate comparison across firms, we also computed market index-adjusted spread ratio, defined as the market index-adjusted spread of a firm in the post-filing period in 2008 divided by its market index-adjusted spread in the same period in 2007. The result, shown in Panel B of Table 5, exhibits that firms with increased rankings of their reporting in the year 2008, on average, experienced 11.8 % reductions in market index-adjusted relative bid-ask spreads in the post-filing period compared to the same period in the previous year (i.e., market index-adjusted relative bid-ask spread ratio is below one). The mean of market index-adjusted relative bid-ask spread ratios, however, is not significantly below one. This statistically insignificant result should be cautiously interpreted since the sample size is very small (i.e., n=4).

Table 5: Analysis of the change in relative bid-ask spread

Panel A: Analysis of relative bid-ask spread before and after the filing of annual report

		Pre-filing period in 2008	Post-filing period in 2008	Difference in means	Spread ratio
Awarded firms					
	Bid-ask spread (mean, n= 30)	0.00317	0.00296	-0.00021	0.93476***
Non-awarded firms					
	Bid-ask spread (mean, n=30)	0.0038	0.00385	0.00005	1.01414

Table 5: Analysis of the change in relative bid-ask spread

Panel B: Analysis of relative bid-ask spreads in the post-filing period in the year 2008 relative to spreads in the same period in the previous year

		Post-filing period in 2007	Post-filing period in 2008	Difference in means	Market index-adjusted spread ratio
Awarded firms[2]					
	Market Index-adjusted spread (mean, n=4)	1.06871	0.88059	-0.18812	0.88183

Notes: [2] Awarded firms that experience increases in their rankings in the 11th Nikkei Annual Report Awards compared to their rankings in the 10th Nikkei Annual Reports Awards. Asterisks indicates that the mean of spread ratios is significantly less than one using a one-tailed *t*-test: * $0.05<p\leq0.1$, ** $0.01<p\leq0.05$ and *** $p\leq0.01$

In short, the above analyses provide additional evidences to our cross-sectional analyses that firms with high quality annual reports, on average, enjoy more reductions in its relative bid-ask spreads in the post-filing period relative to pre-filing period than do firms with low quality annual reports. In addition, firms with increased levels of its annual reports' qualities, on average, experience reductions in its relative bid-ask spreads.

CONCLUSIONS

In this study, we investigated the association of the quality level of Japanese firms' annual reports and their cost of capital. Annual reports of firms that won Nikkei Annual Report Awards were thought to represent higher levels of quality than those of firms not selected by Nikkei. Nikkei awardees should experience less information asymmetry and enjoy lower cost of capital than non-awardees. Our results show that compared to a sample of non-awardee firms, awardee firms exhibit a lower relative bid-ask spread after controlling for firm characteristics and other determinants of relative spread, as well as conducting an additional robustness check. The results of the study are consistent with theoretical studies which argue that increasing the levels of a firm's disclosures lowers its cost of capital.

There are, however, some limitations of this study. Our results depend on the extent to which bid-ask spread is a good proxy for the information asymmetry component of the cost of capital. While many empirical studies employ bid-ask spread as a proxy for information asymmetry, others identify an inherent deficiency in this method. Spread is not only composed of the information cost component, but also inventory holding and other processing cost components, which are unrelated to information asymmetry. Measurement error in the total spread, therefore, might cause bias against the results of an association between disclosure and the information asymmetry component of the cost of capital. Therefore, further research should endeavor to isolate the information cost

component from total spread. In addition, the quality of each corporate annual report depends on the Nikkei award committee's judgments. The committee that assesses the annual reports is comprised of the leading fund managers and analysts, who are therefore likely to be particularly well qualified to judge annual report disclosure. However, it is unclear whether the judges take the rating seriously or what bias they bring to the ratings.

Finally, our findings imply that improving the quality of corporate annual reports ultimately reduces information asymmetry (i.e., narrows bid-ask spread) which is theoretically linked to reduced cost of capital.

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Appendix A.

11th Nikkei Annual Report Awards: Assessment Criteria

1	Message from top management
2	Summary of financial results for the fiscal year
3	Brief descriptions of key factors concerning the business environment such as the industry's structure and business trends
4	Descriptions of business (including outlines of products and services, segment information)
5	Explanations about future management strategy and capital policy
6	Accounts of financial conditions
7	Explanations about corporate governance, compliance and risk management
8	Overall design (bookbinding, sense of uniformity, readability)
9	Use of visual aids for better understanding
10	Table of contents, chapter information, overall structure (ease of cross-referencing)
11	Explanations and analyses of financial conditions by top executives, disclosure of financial risks (MD&A)
12	Financial statements and notes (financial section)
13	Adoption of unique themes (feature articles)

Source: The *Nikkei Weekly* newspaper published on January 12, 2009.

Appendix B.		
Selected firms by the 11th Nikkei Annual Report Awards		
Grand Award		
	SOFTBANK Corp.	
Excellent Award		
	OMRON Corporation	Toyota Motor Corporation
Award		
	Benesse Corporation	Capcom Co., Ltd.
	Fujifilm Holdings Corporation	Hitachi Metals, Ltd.
	JSR Corporation	Kawasaki Kisen Kaisha, Ltd.
	Kyowa Hakko Kirin Co., Ltd	Mitsubishi Corporation
	Mitsui O.S.K Lines	Nippon Mining Holding, Inc
	Nippon Oil Corporation	Shin-Etsu Chemical Co., Ltd
Excellent		
	Asahi Breweries, Ltd.	Chugai Pharmaceutical Co., Ltd
	East Japan Railway Company	KDDI Corporation
	Komatsu Ltd.	Marubeni Corporation
	Mazda Moto Corporation	NTT DATA Corporation
	Oriental Land Co., Ltd	Panasonic Corporation
	Sumitomo Corporation	The Sumitomo Trust and Banking Company, Limited
	Toyota Tsusho Corporation	Yamaha Corporation
	Yamaha Motor Co., Ltd	
Source: The *Nikkei Weekly* newspaper published on January 12, 2009.		

SMALL FIRM GOVERNANCE AND ANALYST FOLLOWING

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ABSTRACT

Prior research strongly indicates that small firms receive reduced security analyst coverage relative to large firms. In this study we ask whether corporate governance in small firms is related to the number of analysts who follow the firm. After controlling for a variety of firm-specific factors that could influence analysts' incentives, we find that small firms with better corporate governance (superior shareholder rights) are indeed followed by a greater number of analysts. Our findings are consistent with analysts exhibiting a preference for covering firms with reduced agency conflict and better information disclosure. Additional evidence suggests that analyst following increases with trading volume and revenue growth, but decreases with share price momentum, firm complexity, and share ownership by inside board members.

Key words: investment banking and brokerage, ownership structure, corporate governance

JEL classification: G24, G32, G34

INTRODUCTION

A number of studies have investigated the factors that influence analysts' decisions to provide coverage of a firm's stock. These studies generally find that smaller firms and firms with lower trading volume are followed by fewer analysts.[1] The evidence suggests analysts have greater incentives to cover firms that are more likely to produce higher brokerage or investment banking income for the analyst's employer. Given the important role analysts play in transmitting firm information to investors, the reluctance of analysts to follow small firms potentially exacerbates the asymmetric information problem (between managers and outside shareholders) for these firms.[2]

In this paper we extend the literature on analyst behavior by examining the relationship between corporate governance and the degree of analyst following for small U.S. firms. We posit that, when considering which small U.S. firms to follow, analysts will prefer firms with superior shareholder rights. This preference is derived from analyst incentives and the likely consequences of poor corporate governance. Analysts have a well-documented incentive to provide coverage for

firms that they view favorably.[3] Firms with weak governance may be viewed unfavorably because of their perceived high agency costs and their perceived inferior information disclosure. Although prior research has examined the relationship between ownership structure and analyst following, to our knowledge this is the first study to test whether a comprehensive measure of shareholder rights is related to the number of analysts covering small U.S. firms.

We sample 365 small firms (using the same size definition as that used in creating the S&P600 Small Cap Index) that have necessary I/B/E/S, Research Insight, and corporate governance data for the year 2002. We focus on small firms for two reasons. First, small firms have particular difficulty in attracting analyst coverage. Second, analyst coverage is probably more important in reducing information asymmetry for small firms, given the limited attention these firms receive in the financial press. We focus on the year 2002 because securities firms were cutting analyst positions at that time, forcing the shrinking population of professional analysts to make difficult choices regarding which firms to follow.[4] As our measure of corporate governance, we use the corporate governance index and corporate governance data provided by Professor Andrew Metrick at the Wharton School. These data have been used in many earlier studies.[5] We regress the number of analysts following a firm on the firm's corporate governance index and we control for several firm-specific factors potentially related to analyst following.

Our main finding is that firms with superior shareholder rights are followed by a greater number of security analysts. This relationship is robust whether OLS regression or negative binomial regression is used. Although we hesitate to make strong claims regarding causality, our evidence is consistent with analysts having a preference for following firms with better corporate governance. We find additional evidence that insider ownership is negatively related to analyst coverage. Bhushan (1989), Hope (2003a), and others have also observed a negative relationship between insider ownership and analyst following. Bhushan (1989) argues that the demand for analyst coverage decreases as the ownership of insiders increases. Hope (2003a) argues that high ownership concentration is associated with managerial incentives to lower financial disclosure quality so that analysts won't trust a firm's reported earnings. Finally, we find that firm size, trading volume, and revenue growth are positively related to analyst coverage, whereas share price momentum is negatively related to analyst coverage.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Researchers have long been interested in corporate governance and the distribution of firm decision rights between managers and shareholders.[6] In this study we test the hypothesis that small firms with better corporate governance attract greater analyst coverage. Analysts have two strong incentives to follow firms with superior shareholder rights. First, analysts usually follow firms that they can favorably recommend (with a "buy" recommendation), so they may avoid firms with poor governance that are likely to suffer high costs of shareholder-management conflict. McNichols and O'Brien (1997) find that analysts initiate coverage of firms that they favorably recommend and

discontinue coverage of firms that they have recently downgraded. Evidence provided by Gompers, Ishii, and Metrick (2003) and others suggest firms with weak governance underperform.[7] A second reason analysts have for avoiding firms with poor governance is these firms are more likely to produce incomplete or misleading financial disclosure. Analysts' careers depend, at least in part, on the quality of their earnings forecasts and investment recommendations. This dependency should lead analysts to cover firms whose managers make more credible information disclosures. Using a sample of firms sued in federal securities class actions, Griffin (2003) finds evidence that analysts decrease coverage of firms following corrective disclosures. His results suggest that analysts avoid covering firms when information quality is problematic or management credibility is in doubt. Lang, Lins, and Miller (2004) argue that firms with poor corporate governance are more likely to suffer high agency costs and are more likely to manipulate or withhold important firm information. They sample non-U.S. firms and find that concentrated family or managerial control of a firm (an indicator of poor governance) is associated with reduced analyst following.

DATA AND METHODOLOGY

We gather an initial sample of small U.S. firms from Research Insight for the year 2002. Our definition of "small" is the same as that used by Standard & Poor's for the purpose of creating the S&P600 Small Cap Index. The firms in this index have a total market value of equity ranging from $300 million up to $1.5 billion. From this initial sample we eliminate all exchange traded funds, all closed end funds, and all non-U.S. firms.

We also eliminate all firms for which information is unavailable regarding the number of analysts following the firm and the firm's corporate governance index. Analyst coverage data were drawn from I/B/E/S. The number of analysts following the firm is defined as the number of analysts providing annual earnings forecasts for the firm. The firm's corporate governance index value is drawn from Professor Andrew Metrick's website at the Wharton School. The construction of this index is described in detail in Gompers, Ishii, and Metrick (2003) and, as noted, these data have been used in many earlier studies. The original data for the index comes from publications of the Investor Responsibility Research Center (IRRC). The IRRC provides information on 24 different corporate governance provisions which Gompers, et al. (2003) divide into five categories: tactics for delaying hostile bidders; voting rights; director/officer protection; other takeover defenses and state laws. Gompers, et al. (2003) construct the index by adding one point for every provision that decreases shareholder rights. Thus, as the value of the governance index increases, a firm's shareholder rights (or corporate governance quality) decreases. For the year 2002, Professor Metrick provides the index values for 1,894 firms on his website.

To control for factors (other than corporate governance) that might influence analysts' incentives to follow firms, we also gather data on the following variables: the percentage of all board members who are insiders[8]; the percentage of outstanding shares owned by inside board members; firm size; trading volume; price-book ratio; share price momentum; and revenue growth. The

motivation underlying inclusion of these control variables is discussed in the results section. Data concerning board composition and inside board member ownership are drawn from proxy statements. All remaining data are drawn from Research Insight. After eliminating firms that lack data on any of the above variables, our final sample consists of 365 small U.S. firms. In some regressions we include the number of industry segments in which the firm operates. Data for this variable are also drawn from Research Insight and inclusion of this variable restricts some model specifications to a 312 firm sample.

To test the relationship between analyst following and corporate governance, we regress the number of analysts following the firm on the governance index and the control variables mentioned above. Rock, et al. (2000) specifically advise that negative binomial regression be used when estimating cross-sectional, analyst-following regressions. However, Bhushan (1989) and Barth, et al. (2001) use standard OLS for their regressions of analyst following. We provide results using standard OLS regression and negative binomial regression. Our main conclusion regarding analyst following and corporate governance is unaffected by this choice.

RESULTS

Summary statistics for all variables appear in Table 1. As noted, we selected a sample of firms from Research Insight such that they meet the size restrictions of firms appearing in the S&P600 Small Cap Index. The 365 firms in our final sample range in size from $302 million to $1.498 billion and have a mean size of $766.5 million. The average number of analysts following sampled firms is 9, with a range from 0 to 35. The governance index variable ranges from 3 (indicating superior shareholder rights) to 18 (indicating inferior shareholder rights).

we control for several factors that might influence analysts' incentives to cover firms. "Firm Size" is the total market value of equity. As noted, many earlier studies find that larger firms have greater analyst following. "Trading volume" is the number of shares of the firm's stock traded in the year 2002. We include this control variable because Barth, et al. (2001) and Jegadeesh, et al. (2004) find evidence that highly traded stocks, which generate greater income for brokerage firms, attract greater analyst following. We also include "Momentum" (one-year raw stock returns), one-year revenue growth, and the price-book ratio as indicators of high growth or "glamour stocks." Prior researchers, such as Jegadeesh, et al. (2004), find that sell-side analysts have a bias in favor of glamour stocks. "Business Segments" is the number of major business segments in which the firm operates, as defined by Research Insight. We include this as a proxy variable for firm complexity, which Bhushan (1989) finds is negatively related to analyst following.

Table 1: Summary Statistics

Shown are summary statistics for a sample of small U.S. firms. Each firm was selected from Research Insight and has a total market value of equity between $300 million and $1.5 billion. All variables are measured for the year 2002. *Analyst Following* is the number of analysts following the firm. *Governance* is the corporate governance index created by Gompers, et al. (2003). *Firm Size* is the total market value of equity. *Trading Volume* is the annual number of shares traded. *Momentum* is the preceding one-year percentage raw return on the firm's stock. *Revenue Growth* is the percentage change in sales for the current year. *Price-book* is the market value of equity divided by the book value of equity. *Insider Ownership* is the percentage of outstanding shares held by inside board members. *Board Insiders* is the percentage of board members who are full time employees of the firm. *Business Segments* is the number of major business segments in which the firm operates (as classified by Research Insight). *Analyst Coverage* data are drawn from I/B/E/S. *Governance* data are drawn from Professor Metrick's web site at the Wharton School. All other data are drawn from Research Insight.

Variable	N	Mean	Median	Standard Deviation	Minimum	Maximum
Analyst Following	365	9.09	8	6.64	0	35
Governance	365	8.69	9	2.78	3	18
Firm Size ($millions)	365	766.52	725.10	331.49	302.27	1497.83
Trading Volume (millions)	365	128.99	60.36	230.75	.098	2182.29
Momentum (%)	365	-8.21	-11.67	111.31	-95.32	1897.88
Revenue Growth (%)	365	14.28	7.36	29.56	-32.58	385.98
Price-book	365	4.26	2.82	9.32	.12	156.75
Insider Ownership (%)	365	8.31	3.4	11.68	0	76.2
Board Insiders (%)	365	24.99	25	11.06	8.3	73.3
Business Segments	312	2.86	3	1.67	1	8

To estimate the relationship between the corporate governance quality and analyst following,

Although the corporate governance quality measure created by Gompers, et al. (2003) is very broad, it does not include information on ownership structure or board composition. Accordingly, we include the control variables "insider ownership" and "board insiders." Insider ownership is the percentage of total shares outstanding held by inside board members. Board insiders is the percentage of board members who are full time employees of the firm. Bhushan (1989) and Hope (2003a) find a negative relationship between insider ownership and analyst following. This can be explained by a reduced demand for analyst coverage as the ownership of insiders increases (Bhushan, 1989) or by analysts' skepticism of the financial disclosure quality of firms with concentrated managerial ownership (Hope, 2003a). Regarding the variable board insiders, analysts may view firms with greater insider board representation as having weaker outside monitoring of management and/or weaker financial disclosure.

Table 2: Ordinary Least Squares Regressions of Analyst Following

Shown are the results of regressing analyst coverage on several variables. The sample includes 365 small U.S. firms, each with a total market value of equity between $300 million and $1.5 billion at the end of year 2002. The dependent variable is the number of analysts following the firm's stock. *Governance* is the corporate governance index created by Gompers, et al. (2003). *Firm Size* is the total market value of equity. *Trading Volume* is the annual number of shares traded. *Momentum* is the preceding one-year percentage raw return on the firm's stock. *Revenue Growth* is the percentage change in sales for the current year. *Price-book* is the market value of equity divided by the book value of equity. *Insider Ownership* is the percentage of outstanding shares held by inside board members. *Board Insiders* is the percentage of board members who are full time employees of the firm. *Business Segments* is the number of major business segments in which the firm operates (as classified by Research Insight). All variables are measured for the year 2002. Coefficient estimates are shown on the top row for each variable. P-values are shown in parentheses and are calculated using White's (1980) corrected standard errors.

	(1)	(2)	(3)	(4)
Intercept	7.469	7.493	6.494	8.412
	(0.004)	(0.000)	(0.000)	(0.000)
Governance	-0.276	-0.302	-0.281	-0.293
	(0.000)	(0.000)	(0.009)	(0.012)
Firm Size	0.003	0.003	0.003	0.004
	(0.001)	(0.001)	(0.000)	(0.000)
Trading Volume	0.013	0.013	0.012	0.011
	(0.000)	(0.000)	(0.000)	(0.000)
Momentum	-0.008	-0.008	-0.007	-0.007
	(0.053)	(0.040)	(0.057)	(0.038)
Price-book			-0.006	-0.005
			(0.745)	(0.799)
Revenue Growth			0.049	0.034
			(0.109)	(0.204)
Insider Ownership		-0.044	-0.041	-0.049
		(0.092)	(0.091)	(0.060)
Board Insiders		2.276	1.685	1.714
		(0.473)	(0.574)	(0.622)
Business Segments				-0.667
				(0.001)
R^2	0.295	0.305	0.350	0.392
N	365	365	365	312

Table 3: Negative Binomial Regressions of Analyst Following

Shown are the results of regressing analyst coverage on several variables. The sample includes 365 small U.S. firms, each with a total market value of equity between $300 million and $1.5 billion at the end of year 2002. The dependent variable is the number of analysts following the firm's stock. *Governance* is the corporate governance index created by Gompers, et al. (2003). *Firm Size* is the total market value of equity. *Trading Volume* is the annual number of shares traded. *Momentum* is the preceding one-year percentage raw return on the firm's stock. *Revenue Growth* is the percentage change in sales for the current year. *Price-book* is the market value of equity divided by the book value of equity. *Insider Ownership* is the percentage of outstanding shares held by inside board members. *Board Insiders* is the percentage of board members who are full time employees of the firm. *Business Segments* is the number of major business segments in which the firm operates (as classified by Research Insight). All variables are measured for the year 2002. Coefficient estimates are shown on the top row for each variable. P-values are shown in parentheses.

	(1)	(2)	(3)	(4)
Intercept	1.919	1.847	1.697	1.905
	(0.000)	(0.000)	(0.000)	(0.000)
Governance	-0.030	-0.033	-0.030	-0.031
	(0.019)	(0.015)	(0.020)	(0.023)
Firm Size	0.000	0.000	0.000	0.001
	(0.000)	(0.000)	(0.000)	(0.000)
Trading Volume	0.001	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)
Momentum	-0.002	-0.002	-0.002	-0.002
	(0.007)	(0.006)	(0.009)	(0.009)
Price-book			0.001	0.001
			(0.800)	(0.763)
Revenue Growth			0.007	0.005
			(0.000)	(0.001)
Insider Ownership		-0.005	-0.006	-0.007
		(0.094)	(0.074)	(0.038)
Board Insiders		0.522	0.441	0.445
		(0.125)	(0.177)	(0.229)
Business Segments				-0.076
				(0.000)
Prob. > Chi^2	0.000	0.000	0.000	0.000
N	365	365	365	312

Ordinary Least Squares (OLS) regression results using White-corrected standard errors are shown in Table 2 and Negative Binomial (NB) regression results are shown in Table 3. In all model specifications, using OLS regression or NB regression, the governance index is negatively related to the number of analysts covering the firm. This relationship is consistently significant at the 0.05 level or better. Our evidence suggests that, among small U.S. firms, those with better corporate governance have greater analyst following. Although we cannot be certain about the direction of causality, the most reasonable interpretation of our evidence is that analysts exhibit a preference for covering firms with better governance.[9]

The results concerning the control variables mostly support findings by earlier researchers. Firm size and trading volume are both consistently, positively related to analyst following. This evidence supports earlier studies and the notion that analysts have greater incentives to follow firms that generate higher income for the analyst's employer-firm. Results from Model (4) in Tables 2 and 3 show that the number of business segments in which the firm operates is negatively related to analyst following. Bhushan (1989) reports similar results. His interpretation of the evidence is that analysts' incentives to cover firms decreases as the cost of analyzing firms increases. The cost of analyzing firms is assumed to rise with firm complexity and the number of business segments is a proxy variable for firm complexity.

We also find evidence using OLS and NB regression that insider ownership is negatively related to analyst following. These results are somewhat weaker, generally significant at the 0.10 level or better, but they are consistent with the findings of Bhushan (1989) and Hope (2003a). Bhushan (1989) argues that demand for analyst services decreases as insider ownership increases. Hope (2003a) argues that financial disclosure is likely to be less credible from firms with a high concentration of managerial ownership.

The evidence regarding "glamour" firms is somewhat mixed. Our indicators for glamour firms include those with high price-book ratios, high revenue growth, or positive share price momentum. Jegadeesh, et al. (2004) finds that analysts are more likely to recommend firms with these characteristics. Because existing evidence also suggests that analysts are more likely to follow firms that they can recommend favorably, we would normally expect a positive coefficient on all of these proxy variables for glamour firms. However, we find only modest evidence that revenue growth is positively related to analyst following, no evidence that price-book ratio is related to analyst following, and additional evidence that share price momentum is *negatively* related to analyst coverage. The findings from Model (3) in Tables 2 and 3 show that revenue growth has a positive coefficient, but the result is only statistically significant using NB regression. Using the same model, share price momentum is negatively related to analyst following at $p = 0.057$ using OLS regression and at $p = 0.009$ using NB regression. Price-book ratio is not significant in any model estimation. Our mixed evidence regarding glamour firms may reflect reduced analyst incentives to cover such firms in the latter period of the 2000-2002 bear market when many glamour firm stocks produced especially low returns. Finally, the percentage of board members who are insiders does not enter significantly in any of model estimations.

CONCLUSIONS

We use a sample of small U.S. firms to test whether the quality of corporate governance is related to the degree of analyst following. We focus on small firms because: (1) they have particular difficulty in attracting analysts' attention; and (2) given the limited coverage of small firms in the financial press, analyst coverage of them is arguably more important in mitigating the information asymmetry problem between managers and outside shareholders. Our measure of corporate governance quality is broad and has been used in many recent studies. However, this is the first study (to our knowledge) that relates a comprehensive measure of corporate governance quality to analyst coverage. After controlling for a variety of firm-specific factors that could influence analysts' incentives to provide coverage, we find that firms with stronger corporate governance are followed by a greater number of analysts. We argue that analysts prefer to cover firms with better governance because these firms have lower expected agency costs and higher expected financial disclosure quality.

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ENDNOTES

[1] See, for example, Bhushan (1989), Rajan and Servaes (1997), Barth, et al. (2001), Bradley, et al. (2003), and Jegadeesh et al. (2004).

[2] Some earlier researchers, such as Chang, Dasgupta, and Hilary (2006), use low analyst following as a proxy for greater information asymmetry.

[3] See McNichols and O'Brien (1997), Rajan and Servaes (1997), Bradley, et al. (2003), and Cliff and Denis (2004

[4] Craig (2003) reports a 20% drop in the number of firms receiving analyst coverage in the two years following the March 2000 U.S. stock market peak. Investment banks slashed research budgets by 35% from 2000 to 2005 (The Economist, 2007).

[5] See Gompers, Ishii, and Metrick (2003), Klock, Mansi, and Maxwell (2005), Core, Guay, and Rusticus (2006), and Dittmar and Smith (2007). Professor Metrick's data are available at http://finance.wharton.upenn.edu/~metrick/data.htm.

[6] The agency problem arising from the separation of shareholder ownership and managerial control was recognized at least as early as Berle and Means (1932) and Coase (1937). This literature was further developed by Jensen and Meckling (1976), Fama (1980), Fama and Jensen (1983a,b) and others.

[7] For further evidence that poor governance is associated with lower valuations or firm underperformance, see Core, Holthausen, and Larcker (1999) and Klapper and Love (2004). For detailed surveys of the evidence on corporate governance around the world see Shleifer and Vishny (1997) and Denis and McConnell (2003).

[8] We define an "inside" board member as a board member who is a full time employee of the firm.

[9] We conducted (but do not show in the tables) several robustness checks. Many additional model specifications were used and in all cases the governance index is significant at the 0.05 level or better in both OLS and NB regressions.

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MANAGEMENT USE OF IMAGE RESTORATION STRATEGIES TO ADDRESS SOX 404 MATERIAL WEAKNESS

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ABSTRACT

This study uses Benoit's (1995) image restoration typology to analyze the communication strategies used by 133 computer companies to respond to material weaknesses reported in compliance with Sarbanes-Oxley Section 404 requirements. Our research questions include whether (1) firms use corrective action to address material weaknesses, (2) firms that use corrective action are more likely to remedy their material weaknesses, (3) firm characteristics are associated with the use of a non-corrective strategy, (4) the strategy used is related to the type of material weakness reported, and (5) a relationship exists between the type of weakness according to COSO classifications and the correction of that weakness. We find that the majority of firms use corrective action strategies. Statistical tests indicate that no significant relationship exists between (1) the strategy used and whether management corrects the weakness, (2) the strategy used and the type of weakness, or (3) the type of weakness and the correction of the weakness in subsequent periods. Logistical regression analysis shows that more mature, smaller, less complex firms with higher betas and slower asset growth are more likely to use non-corrective action strategies.

INTRODUCTION

In response to recent financial failures and scandals, the Sarbanes Oxley Act of 2002 requires the implementation of Section 404 related to internal control over financial reporting and mandates management's disclosure of its assessment of the firm's internal controls as well as the corresponding opinion by the firm's auditor.[1] Recently, the PCAOB and the SEC have worked closely to coordinate Auditing Standard No. 5 to guide public company management on a principles-based auditing standard designed to increase the likelihood that auditors will find material weaknesses in internal control before material misstatements of a company's financial statements occur and to eliminate unnecessary auditing procedures. Mark Olson, PCAOB Chairman, indicates that "The internal control reporting requirements of the Sarbanes Oxley Act are a key reason why

the reliability and accuracy of financial reporting has improved over the past few years. The renewed confidence in financial reporting is critical for the health of our markets" (PCAOB 2007).

The purpose of this study is to investigate one specific industry, computers, and how management responds to material weaknesses in internal control. An analysis of management responses within 133 companies provides useful information to public policy makers, practitioners, and users of financial reports about the communication strategies these firms use, the types of material weaknesses that appear to evoke strategies other than corrective action, and the types of material weaknesses that are most prevalent according to the COSO *Internal Control Framework* (1992).

Benoit's (1995) image restoration typology assists in the determination of the communication strategies management uses to explain how such material weaknesses occur and what strategies management intends to use to address those weaknesses. As expected, the results show that the majority of companies use a corrective action strategy when addressing material weaknesses. However, several firms use other communication strategies that include denial; evasion of responsibility; or reducing the problem through image bolstering, minimizing the weakness, or stating that their situation is different from other companies. When companies use communication strategies other than corrective action, management reporting is potentially not transparent. If management uses similar strategies in other financial reporting disclosures, users may have concerns about whether management is fairly reporting the company's economic reality. Results of this study also indicate that the use of a corrective action strategy is not related to the type of material weaknesses disclosed. Additionally, we find that the correction of material weaknesses in general is related to company characteristics rather than the type of material weakness or the strategy used to respond to the material weakness.

This study also finds that computer firms that report material weaknesses are smaller and less profitable than other firms in the computer industry. As the PCAOB develops guidance for smaller companies for applying Auditing Standard No. 5, this study increases the understanding of the types of internal control weaknesses found within smaller companies and their management's reaction to these weaknesses. This could assist standard setters in the policies and guidance they provide.

The paper is organized as follows. First, we summarize prior research relating to the disclosure of internal controls and develop research questions. Next, we describe our sample selection and data collection. Then, we provide data on the types of communication strategies firms use and report the results of our statistical analysis related to communication strategies and COSO components. Finally, we summarize our findings and discuss their implications.

BACKGROUND

SOX requirements relating to financial reporting and internal control analysis emphasize management responsibility for preparing financial reports. This has generated academic interest, resulting in several different research streams regarding firm reporting and compliance under

Section 404, including the market reaction to internal control weakness disclosures and the characteristics of firms that have material weaknesses. Our study concentrates on how management addresses their material weaknesses by analyzing firms' Section 404 disclosures within the computer industry. We analyze these disclosures to see if firm characteristics are systematically different for firms that respond to material weaknesses using communication strategies other than corrective action.

We study the computer industry for several reasons. First, studies by Ge and McVay (2005) and Bryan and Lilien (2005) indicate that firms in the computer industry (which includes computer hardware and software, electronic components and accessories, and electronics) disclose more material weaknesses than firms in other industries. The most prevalent material weaknesses in the computer industry include lack of training, deficiencies in the period-end reporting processes and accounting policies, deficient revenue-recognition policies, lack of segregation of duties, and inappropriate account reconciliation (Ge and McVay 2005). Second, because the computer industry is highly competitive, firms must adapt their structures and strategies to the specific demands of their environment (Duysters and Hagedoorn 2001). Thus, these firms need to quickly adapt to SOX 404 requirement in order to remain viable in their competitive environment. Third, Rezaee and Jain (2005) and Beasley, et al. (2000) cite numerous studies that find that the computer-related industries have a prevalence of fraudulent financial statements. Loebbecke et al. (1989) observe that where internal controls over top management are weak, the environment is such that fraudulent financial reporting could occur. Finally, by studying a single industry, we can avoid differences in products and markets and consider firm-specific factors in our analysis.

When a company reports internal control weakness under SOX 404, management's responses to the internal control weaknesses provide insight into how the company intends to change and improve internal controls. These responses also communicate the firm's image. Material internal control weaknesses can provide information about a potential pre-crisis situation in that a failure of the firm to correct the weakness can result in a loss of investor and creditor confidence in the firm's financial statements or even in business failure. Management must first acknowledge why material weaknesses exist before they can correct the weaknesses. By studying management responses to material weaknesses, we gain insight into how serious management is about taking the necessary actions to eliminate these weaknesses.

Researchers have used Benoit's (1995) typology to study organizational responses to crisis. These communication strategies provide a useful framework to understand and analyze how a company responds to stakeholders about significant material weaknesses in internal control that are indicators of a pre-crisis situation, which could lead to fraudulent activity or other severe business risks (Cowden and Sellnow 2002). Seeger et al. (2003, 109) study pre-crisis communication, and note that the pre-crisis period is characterized by "missed warnings, failed interpretations, and/or failure to act on warnings." Ineffective management of these warning signs can result in a movement from the pre-crisis to the crisis stage, resulting in losses for stakeholders.

Benoit (1995, 178) makes clear that every crisis includes two components: "(1) the accused is held responsible for an action and (2) that the act is considered offensive." SOX requires that company officers certify their responsibility for implementing adequate internal control policies and procedures. However, management can use various strategies to disclose the weakness, to evaluate the weakness, and to address their responsibility to correct the weakness. An analysis of communication strategies used in SEC reports provides insight into management's reactions to internal control weaknesses and its use of corrective action to avoid a potential crisis.

Benoit's theory of image restoration (1995) has two key assumptions: (1) communication is a goal-directed activity and (2) maintaining a positive reputation is one of the central goals of communication. Management presents the messages (responses) that are instrumental in obtaining the firm's goals. The firm must believe that they are capable of carrying out their response, that the response likely facilitates accomplishment of their goal, and that their response will not result in unreasonable costs. When the firm believes that negatively perceived events (such as disclosure of material weaknesses) threaten its reputation, management may feel compelled to offer explanations, defenses, justifications, rationalizations, apologies, or excuses for its behavior. If the audience accepts the explanation (response), the firm can restore its image (reputation).

Benoit's (1995) five categories of image restoration consist of denial, evasion of responsibility, reducing the offensive act, taking corrective action, and mortification. The five categories include fourteen unique communication (response) strategies as shown in Table 1.

Benoit's (1995) typology is hierarchical in that the best strategy, if a firm is truly blameless, is to deny responsibility outright for any wrong-doing. Denial is an inappropriate strategy under Sarbanes-Oxley because management is legally responsible for establishing and monitoring internal controls. Since denial is inappropriate, the organization can choose to evade responsibility, or claim that a weakness is not entirely the company's fault by claiming others provoked the action, the company lacked information, the action was an accident, or the company intended to implement strong controls but was somehow thwarted. If a company cannot evade a responsibility that clearly exists, the company can reduce the offensiveness of the act by bolstering its image, minimizing the effect of material weaknesses, pointing out differences between other situations and the current circumstances, or asserting that good actions far outweigh the material weaknesses. Compensating the victim for a loss is generally not an option since no known monetary loss has yet occurred. Corrective action is the most viable strategy because the firm addresses the source of the problem, explains how changes will eliminate future material weaknesses, and implements the revised controls.

Table 1 Benoit's typology

Categories	Strategy	Description/example
Denial	1. Simple denial	1. Refuting outright that the organization had any part in the event
	2. Shifting the blame	2. Asserting that someone else is responsible
Evasion of responsibility	3. Scapegoating	3. Blaming the event on the provocation of another
	4. Defeasibility	4. Not knowing what to do; lacking knowledge to act properly
	5. Accident	5. Claiming the event was "accidental"
	6. Good intentions	6. Claiming the company had good intentions
Reducing the offensive act	7. Image bolstering	7. Using puffery to build image
	8. Minimization	8. Stating the crisis is not bad
	9. Differentiation	9. Indicating that this crisis is different from more offensive crises
	10. Transcendence	10. Asserting good acts far outweigh the damage of this one crisis
	11. Reducing the credibility	11. Maintaining the accuser lacks credibility
	12. Compensation	12. Paying the victim; making restitution to set things to where they were before the event
Taking corrective action	13. Corrective action	13. Taking measures to prevent event from reoccurring
Mortification	14. Mortification	14. Admitting guilt and apologizing

Because management is responsible for internal control structures, we expect the primary communication strategy used by management is corrective action, which includes any measures already taken or planned that eradicate the material weakness. Management accepts its responsibility to eliminate material weaknesses before they result in a crisis.

Previous research has documented the characteristics of firms disclosing material weaknesses. Firm size is a determinant of good internal control (Ashbaugh-Skaife et al. 2007; Doyle et al. 2007; Ge and McVay 2005; and Bryan and Lilien 2005). Large firms are more likely to have better reporting processes in place and tend to have more employees and greater resources to spend on their internal control processes, whereas small firms may lack sufficient resources to implement effective internal controls. Firms that engage in more complex transactions and more diverse operations have a greater need for effective internal controls in order to consistently implement controls across divisions. (Doyle et al. 2007). Rapid-growth firms may outgrow their internal controls or they may dedicate a large portion of their resources to support growth rather than internal control processes (Doyle et al. 2007). Poorly performing (less profitable) firms may not be able to invest in the proper internal control processes or they may be so concerned about improving their

financial performance that they do not put sufficient resources and time into their internal controls (Ge and McVay 2005; Ashbaugh-Skaife et al. 2007).

The age of the firm may also be associated with the existence of material weaknesses as younger firms may not have the appropriate procedures in place to effectively manage their internal control processes leading to a higher likelihood of having material weaknesses (Ge and McVay 2005 and Doyle et al. 2007). Bryan and Lilien (2005) find that firms with higher market risk (beta) are more likely to have material weaknesses than firms with lower betas. Ashbaugh-Skaife et al. (2007) find that firms with greater incentives to discover and disclose material weaknesses (such as a large percentage of institutional investors and /or a prestigious auditor with substantial reputational capital) are more likely to report material weaknesses. We are interested in which, if any, of these characteristics are associated with the firm's use of a non-corrective action strategy.

Thus, the first set of research questions is:

RQ1a: *Does a firm respond to material weaknesses with a corrective action strategy, recognize its responsibility, and take or plan to take action to correct the weaknesses?*

RQ1b: *Are firms that use a corrective action strategy more likely to remedy their material weaknesses than firms that use strategies other than corrective action?*

RQ1c: *What firm characteristics (size, complexity, profitability, age, growth, market risk, and incentive to report material weaknesses) are associated with the use of a non-corrective action strategy?*

To determine what types of material weaknesses are most prevalent in the computer industry, we classified the firms' material weaknesses and actions in response to these weaknesses within the COSO *Internal Control Framework* (1992), one of the models most commonly adopted by companies and recommended by PCAOB's Auditing Standard No. 5. This framework identifies five internal control components: (1) control environment, (2) risk assessment, (3) control activities, (4) information and communication, and (5) monitoring as described in Table 2.

Table 2: COSO's Components of Internal Control	
Component	Description
Control environment	Tone of the organization
	Integrity and ethical values
	Management philosophy and operating style
	Organizational structure
	Assignment of authority and responsibility
	Human resource policies and procedures
	Board of directors and audit committee
Risk assessment	Company-wide objectives
	Process-level objectives
	Risk identification and analysis
	-Technological developments
	-Competition
	-Economic changes
	Internal factors such as personnel quality, the nature of the entity's activities, and characteristics of information system processing
Control activities	Performance reviews and analysis of performance
	Segregation of duties
	-Authorizing transactions
	-Executing transactions
	-Recording transactions
	-Custody of assets
	-Reviewing processes
	-Performing reconciliations
	System controls
	-Application controls that include entering and processing information as well as developing and maintaining application software
	-General controls to restrict access to computers, software, data
Information and communication	Establishing procedures and records to initiate, record, process, and report the entity's process
Monitoring	Continual evaluation of the effectiveness of internal control process
	Reporting deficiencies

We are interested not only in the type of material weaknesses reported by firms in the computer industry, but whether the type of material weakness is related to the image restoration strategy firms use to respond to the material weakness. Thus, our second set of research questions is:

RQ2a: *Is the response strategy the firm uses related to the type of material weakness reported?*

RQ2b: *Is there a relationship between the type of material weakness reported and the correction of the material weakness?*

SAMPLE SELECTION AND DATA COLLECTION

We identified firms in the computer industry[2] that reported material weaknesses in internal control in their 2004 and 2005 10-K and 10-Q SEC filings from two sources: 1) Compliance Week and 2) EDGAR by searching the keywords "material weakness" and "internal control" and collected each firm's Section 404 report. These material weakness disclosures are made in Item 9A: Controls and Procedures of the firm's 10-K and in Management's Report on Internal Control over Financial Reporting and in Item 4: Controls and Procedures of the 10-Q. Accelerated filers began reporting for years ending after November 2004 (2005 annual report). Thus, our data reflects the first time a firm reported an internal control weakness under Section 404.[3] If a firm reported no material weaknesses during 2005 but did indicate a correction for a material weakness stated in their voluntary reporting for the previous year, we collected the data for 2004 rather than 2005. Two researchers independently classified the material weakness responses using Benoit's (1995) image restoration typology (Table 1). Any classification discrepancies were discussed between the researchers and a consensus was reached as to the proper classification. The classification of material weaknesses using the COSO model (Table 2) was conducted in the same manner.

The resulting sample includes 133 companies in the computer industry that disclosed a total of 344 material weaknesses during the sample period.[4] Some material weaknesses evoked more than one response, resulting in a total of 363 responses. In 2005, 862 firms existed in the computer industry, 503 of which were accelerated filers.

We use a univariate analysis to compare the median values of the material weakness firms to those of the computer industry for firm size, profitability, age, growth, market risk, complexity, and incentive to disclose material weaknesses. Table 3 contains information on the definitions and data sources for the variables used for statistical analysis as well as characteristics of material weakness firms (133 firms) versus the computer industry (503 firms) and the mean and median values for each variable.[5, 6]

Table 3: Characteristics of Material Weakness Firms versus Computer Industry--2005					
	Material Weakness		Computer Industry[1]		Wilcoxon Test Statistic
VARIABLE	Firms N=133		N=503		(two-tailed p value)
	Mean	Median	Mean	Median	
Size					
Total Assets	$565.18	$175.22	$2,111.32	$294.11	0.0000***
Book Value	$271.94	$102.01	$1,114.37	$186.67	0.0000***
Market Cap	$643.99	$219.71	$4,401.88	$525.06	0.0000***
Employees	2.39	0.48	6.11	0.89	0.0002***
Profitability/Financial Health					
ROA (%)	-7.85%	-1.25%	-1.82%	4.30%	0.0000***
CFO/TA (%)	0.37%	3.11%	6.09%	8.80%	0.0000***
Altman Z-Score	0.97	3.35	7.1	4.04	0.0802*
Firm Age	10.24	8.29	11.33	8.12	0.9447
Growth					
Sales growth (2000-2005)	11.55%	6.14%	10.15%	6.54%	0.8698
Sales growth (2002-2005)	21.67%	10.55%	19.57%	12.42%	0.6688
Asset growth (2000-2005)	6.63%	1.93%	7.63%	6.10%	0.224
Asset growth (2002-2005)	27.38%	5.55%	20.98%	10.25%	0.3227
Market Risk					
Beta	1.15	1.12	1.19	1.16	0.5123
Complexity					
Business segments	1.8	1	1.96	1	0.4647
Foreign currency adjustment	-0.72	-0.11	-0.87	-0.4	0.2126
Incentive to Report MW					
Institutional Ownership	54.59	58.15	65.03	71.89	0.0014***

[1] SIC Codes 3570-3579, 3670-3679, and 7370-7379

* Indicates significance at the 0.10 level, ** Indicates significance at the 0.05 level, ***Indicates significance at the 0.01 level

All variables obtained from Compustat, except firm age and beta, which were obtained from CRSP. Total Assets, Book Value (equity), and Market Capitalization (price x shares outstanding) are dollar amounts shown in millions. Employees indicates the number of employees per firm. ROA (%) is return on assets, measured by dividing net income before extraordinary items by total assets and is used as a measure of firm profitability. Another measure of profitability, CFO/TA (%), is cash flow from operations divided by total assets. The Altman Z-score is a measure of financial distress. Firm age (in years) is number of years the firm has price data available on CRSP.

Table 3: Characteristics of Material Weakness Firms versus Computer Industry--2005

Sales growth and asset growth are calculated by finding the average annual growth rate in sales and assets, respectively, over a 3 year period and a 5 year period. Beta is a measure of market risk and is calculated from CRSP data using monthly returns for 5 years. Business segments is the number of reported business segments. Foreign currency adjustment realized and unrealized foreign exchange gains and/or losses included in the determination of income for the period. Institutional ownership (%) is the percentage of shares owned by institutional investors.
The Wilcoxon Statistic tests the statistical significance of differences in the medians of the material weakness firms and the computer industry. Medians were used instead of means because data for most firm characteristics are skewed.

Results of our analysis are consistent with previous research for the size, profitability, and bankruptcy variables. However, we observe several differences from previous research. First, the median age of the material weakness firms does not differ significantly from the median firm age of the computer industry[7]. Second, the material weakness firms in our study do not differ significantly from the computer industry in levels of sales and asset growth. Third, the complexity of the firm is not positively associated with the existence of material weaknesses, which is in contrast to results of Ashbaugh-Skaife et al. (2007) and Doyle et al. (2007). Fourth, our results also indicate that the median percentage of institutional ownership is significantly lower for material weakness firms than for the computer industry which is not consistent with Ashbaugh-Skaife et al. (2007), who find that higher levels of institutional ownership result in greater incentives on the part of the company to report material weaknesses because of the additional monitoring placed on the company by institutional owners. Finally, in contrast to Bryan and Lilien's (2005) results, the market risk (beta) of material weakness firms is not significantly different from the market risk of the industry[8].

RESULTS

The first set of research questions requires an analysis of firms' responses to material weaknesses using the communication strategies as defined by Benoit's (1995) image restoration typology. Table 4, Columns A-C, presents a summary of the strategies used by the firms in our sample.

Table 4: Image Restoration Strategies by Typology for 133 Material Weakness Firms				
Typology	Number of Times Used	Total for Category	Number of Instances Remaining after 2006 Annual Report	Total Remaining for Category
Denial				
Denial	3		0	
Shifting the Blame	6	9	0	0
Evasion of Responsibility				
Scapegoating	21		1	
Defeasibility	2		0	
Good Intentions	7	30	4	5
Reducing the Offensiveness				
Bolstering Image	6		2	
Minimization	3		0	
Differentiation	1	10	0	2
Taking Corrective Action		314		60
TOTAL		363		67

As anticipated, we find that management uses corrective action most frequently (314 times or 87% of the time). However, one of the most interesting observations is that some computer firms use other image restoration communication strategies. This may indicate that reporting lacks transparency and that management may not take measures to prevent material weaknesses.

Firm Use of Strategies Other Than Corrective Action

The use of strategies other than corrective action may indicate that firms might face problems in the future. Some firms in our sample used the denial strategy of shifting the blame to a third party. For example, one company fired a tax advisor for improper deferred tax calculations; another changed auditors, indicating the problem was with the accounting firm and not with the internal controls themselves; another blamed the lack of controls over accounting data entry on their software provider. Only one company (three instances) used outright denial by claiming that their procedures and policies were effective.

Within our sample, several firms used the evasion of responsibility strategies of scapegoating, defeasibility, and good intentions. Scapegoating was the most frequently used strategy

other than corrective action, which could indicate that management did not want to take all the responsibility for failure to implement effective internal controls. These firms most often placed responsibility for material weaknesses on a lack of accounting personnel or on inadequately trained staff. Others attributed their weaknesses to suppliers, freight carriers, and distributors. One company even alleged that the SEC and its requirement to comply with SOX regulations was a cause of their internal control problems. Another company associated their troubles with a difficult accounting software conversion. Examples of defeasibility (claiming lack of knowledge) include companies claiming that a lack of accounting personnel prohibited the organization from obtaining the necessary information about internal controls or that an acquisition made it impossible to assess internal controls. Our study found that companies used the strategy of good intentions by claiming they would have liked to increase controls but could not due to a reduction in accounting staff, a budgeted reduction in costs, or resignation of employees.

There were ten instances of companies attempting to reduce the offensiveness of the act by bolstering their image, minimizing their weaknesses, and differentiating their situation from others. Examples of bolstering include blaming internal control problems on growth, stressing the importance of the company's code of conduct, or emphasizing that new accounting employees and executives had the credentials of CPA and MBA. Because these individuals were well-qualified to perform their duties, the likelihood of future internal control weaknesses should be reduced. Examples of minimizing weaknesses include claiming the lack of internal control was not a problem because the financial statements were not misstated and stating that the branch with the internal control problems was not important to the company as a whole. Only one company used the differentiation strategy by claiming their situation was different from other companies that had similar material weaknesses. This firm had moved their entire operations and lost the majority of their accounting personnel in the process.

To address whether firms using a corrective action strategy are more likely to remedy their material weaknesses than firms using other strategies, we analyzed the material weakness companies' 10-K reports following the initial disclosure of material weaknesses.[9] Thirty-five of the 133 material weakness firms still reported material weaknesses as of the end of 2006. Results of the analysis, which are found in Columns D and E of Table 4, indicate that a total of 67 of the original 363 (approximately 18%) responses remained at the end of 2006, with 60 of these responses associated with material weaknesses originating with corrective action firms and seven from non-corrective action firms.

Table 5: Logistic Regression Results for 133 Material Weakness Firms

Panel A: Probability that Response Strategy is Related to Material Weakness Correction			Panel B: Probability of a Firm Using Non-Corrective Action		
Dependent Variable			Dependent Variable		
MWFIX			MWNCA		
Independen Variables	Coefficients	p-values	Independent Variables	Coefficients	p-values
Intercept	1.374	0.075*	Intercept	-2.696	0.123
Total Assets (Ln)	0.035	0.759	Total Assets (Ln)	-0.773	0.052*
Cash Flow to Assets	1.024	0.063*	Cash Flow to Assets	-0.373	0.784
Altman Z (decile rank)	-0.004	0.919	Altman-Z (decile rank)	-0.057	0.632
Firm Age	-0.009	0.441	Firm Age	0.09	0.012**
5-year Asset Growth	0.255	0.655	5-year Asset Growth	-7.338	0.008***
Firm Beta	0.361	0.024**	Firm Beta	0.768	0.098*
Business Segments (Ln)	0.296	0.137	Business Segments (Ln)	-1.279	0.078*
oreign Currency Adjustment (FCABIN)	0.39	0.102	Foreign Currency Adjustment (BIN)	-0.389	0.604
Institutional Ownership	-0.001	0.912	Institutional Ownership	0.018	0.282
Auditor (AUDBIN)	-0.312	0.304	Auditor (BIN)	1.599	0.096*
ResponseCA	-0.739	0.177	ResponseCA		
ResponseER[1]	-0.421	0.578	ResponseER		

- Total Assets, Cash Flow to Total Assets, Altman Z-Score, Asset Growth, Business Segments, Foreign Currency Adjustment, Institutional Ownership, and Auditor were obtained from Compustat. Beta was obtained from CRSP and Firm Age was obtained from Lexis Nexis using either the Hoover's Indepth Company Report or the 10-K report.
- MWFIX is an indicator variable that is equal to 1 if the material weakness has been fixed and 0 if not.
- MWNCA is an indicator variable that is equal to 1 if the firm used a non-corrective action strategy for the particular material weakness and 0 if the firm used a corrective action strategy.
- FCABIN is a binary variable that is equal to 1 if the firm reports a foreign currency adjustment and 0 if not.
- AUDBIN is a binary variable equal to 1 if the firm is audited by the largest 6 auditors and 0 if not. Large auditors are PWC, Deloitte & Touche, Ernst and Young, KPMG, Grant Thornton, and BDO Seidman (Ashbaugh-Skaife et al. 2007)
- ResponseCA is binary variable that is equal to 1 if the firm used a corrective action strategy to respond to the particular weakness and 0 if the firm used a non-corrective action strategy.
- ResponseER is a binary variable that is equal to 1 if the firm used an evasion of responsibility strategy and 0 if the firm used another strategy.

[1] There were not enough occurrences of denial or reducing the offensiveness to include in the regression analysis. The categories were combined and there were not a sufficient number of occurrences to be included in the regression analysis.

* Indicates significance at the 0.10 level

** Indicates significance at the 0.05 level

*** Indicates significance at the 0.01 level

Results of a χ^2 test of independence indicate that no relationship exists between the image restoration strategy and the correction of material weaknesses in subsequent periods. The χ^2 statistic of 2.205 for image restoration strategy is less than the critical value of 7.815 (degrees of freedom =3 and α=0.05) which indicates we accept the null hypothesis of independence. Table 5, Panel A contains results of a logistic regression analysis conducted to determine if firms using a corrective action strategy are more likely to fix material weaknesses than other firms. We find that firms with higher profitability and greater market risk are more likely to fix material weaknesses, but that the use of a corrective strategy is not significantly related to the rectification of the material weaknesses. Thus, we find that the correction of material weaknesses in general is related to the company itself rather than the type of communication strategy used.[10]

To address the third part of research question 1, we use the following logistic regression model to analyze the characteristics of firms using non-corrective action strategies.

$$PROB(MWNCA) = f(B_0 + B_1 log(TA) + B_2 CFTA + B_3 DECILEZ + B_4 AGELN + B_5 AG05 + B_6 BETA + B_7 log(SEG) + B_8 FCABIN + B_9 IOWN + B_{10} AUDBIN) \quad (1)$$

where MWNCA = if the firm used a non-corrective action strategy and 0 if the firm used a corrective action strategy; other variables are as defined in Tables 3 and 5.

We classified each material weakness response as a separate observation because 1) several firms used both corrective action and other strategies and 2) many weaknesses evoked more than one response, resulting in 363 responses used in the logistic regression model. As presented in Table 5, Panel B, the results indicate that smaller, less complex firms are more likely to use non-corrective action strategies than other material weakness firms. These non-corrective action companies have higher market risk (beta) and are likely to be audited by one of the six largest accounting firms. Also, non-corrective action firms display slower asset growth and are more mature than all material weakness firms.[11]

We also use a univariate analysis to compare the characteristics of firms that employ strategies other than corrective action to the computer industry as a whole. As seen in Table 6, we present the mean and median values for each of these variables for the non-corrective action firms (35 firms) and the computer industry (503 firms). As expected, the results indicate that the non-corrective action firms were smaller and less profitable than the computer industry. The non-corrective action firms also have a lower Altman Z-Score than the computer industry, which indicates a higher risk of bankruptcy for these firms. The non-corrective action firms grew more slowly in both the 3- and 5-year periods (asset growth) than the computer industry. Finally, non-corrective action firms have a lower percentage of institutional ownership than the median for firms in the computer industry.

Table 6: Characteristics of Non-Corrective Action Firms 2005

	Non CA Firms N=35		Computer Industry N=503		Wilcoxon Test Statistic (two-tailed p value)
VARIABLE[1]	Mean	Median	Mean	Median	
Size					
Total Assets (in millions)	$412.37	$207.36	$2,111.32	$294.11	0.0286**
Book Value (in millions)	$197.75	$86.01	$1,114.37	$186.67	0.0068***
Market Cap (in millions)	$539.00	$184.54	$4,401.88	$525.06	0.0004***
Employees	1.23	0.48	6.11	0.89	0.0307**
Profitability/Financial Health					
ROA	-11.97%	-5.59%	-1.82%	4.30%	0.0005***
CFO/TA	-6.62%	1.79%	6.09%	8.80%	0.0036***
Altman Z-Score	-7.86	2.59	7.1	4.04	0.0036***
Firm Age (years)	9.82	7	11.33	8.12	0.5329
Growth					
Sales growth (2000-2005)	7.25%	4.87%	10.15%	6.54%	0.6282
Sales growth (2002-2005)	18.71%	10.05%	19.57%	12.42%	0.6436
Asset growth (2000-2005)	-4.48%	-3.25%	7.63%	6.10%	0.0016***
Asset growth (2002-2005)	8.78%	3.27%	20.98%	10.25%	0.0056***
Market Risk					
Beta	1.19	1.24	1.19	1.16	0.8621
Complexity					
Business segments	1.74	1	1.96	1	0.6026
Foreign currency adjustment	-0.55	-0.02	-0.87	-0.4	0.6877
Incentive to Report MW					
Institutional Ownership	49.97	52.14	65.03	71.89	0.0197**

[1] Variable definitions are identical to those in Table 3.

** Indicates significance at the 0.05 level

*** Indicates significance at the 0.01 level

The Wilcoxon Statistic tests the statistical significance of differences in the medians of the material weakness firms and the computer industry. Medians were used instead of means because data for most firm characteristics are skewed.

Table 7: Material Weaknesses Classified by COSO's Components of Internal Control

Classification of Responses to Different Types of Material Weaknesses

Component	Description of Material Weakness	# of Material Weaknesses All Firms in Sample (n=133 firms)	# of Corrective Action Responses (n=98 firms)	# of Non-Corrective Action Responses[2] (n=35 firms)			# of Material Weaknesses Non-Corrective Action Firms
				RO	ER	D	
Control Environment	Reorganization, tone, board	34	22	2	8	2	12
Risk Assessment	Risk Assessment	5	4	0	1	0	1
Control Activities	Period End Reporting/Accounting	72	53	4	13	2	19
	Recording, ExecutingTransactions—Account Specific:						
	Income taxes	40					
	Inventory	16					
	Other[1]	32					
	TOTAL	88	70	0	11	7	18
	Revenue Recognition	38	25	2	9	2	13
	Technology, Spreadsheets, Control	31	25	0	4	2	6
	Segregation of Duties	16	10	0	6	0	6
	Stock Options	12	8	0	2	2	4
	TOTAL	257	191	6	45	15	66
Information and Communication	Training						
	Training/Staffing	144	115	0	23	6	29
	Training for Complex Transactions	21	16	0	5	0	5
	TOTAL	165	131	0	28	6	34
	Review Procedures	69	49	4	12	4	**20**
	Documentation, Communication	45	36	0	7	2	9
	Subsidiary Specific	29	12	3	14	0	17
	TOTAL	308	228	7	61	12	80
Monitoring	*None reported in this area*						
	Total for Five Components	604	445	15	115	29	155

[1] This category includes material weaknesses in the following areas: fixed assets, accruals, lease classifications, accounts receivable, sales tax, cash disbursements, purchasing, and accounts payable.

[2] RO is reducing the offensiveness of the act, ER is evasion of responsibility, and D is denial.

To determine what types of material weaknesses are most prevalent in the computer industry, we classified the firms' material weaknesses and actions in response to these weaknesses within the COSO *Internal Control Framework* (1992). Table 7, Columns A-C, shows the classification of the sample firms' material weaknesses using the five components of the COSO model. Of the total 344 material weaknesses reported, 604 instances relate to the COSO model. These numbers are not equal because some material weaknesses involved more than one area such as revenue recognition of subsidiaries or establishing system controls for inventory.

The majority of the reported weaknesses are in two areas: 1) control activities and 2) information and communication. Within the control activities category, the most common problems relate to segregation of duties and the appropriate recording, executing, reviewing, and reconciling of accounts; particularly income tax accounting and revenue recognition. The largest number of material weaknesses and associated actions involve training and staffing issues (information and communication component), including training for complex transactions and adding or training staff to react to other material weakness, resulting in 165 instances. These results are consistent with Ge and McVay (2005) who find that the most common material weaknesses declared by firms in the computer industry relate to revenue recognition, training, and period end reporting/accounting policies.

In order to respond to the first part of the second research question, we determine what types of image restoration strategies firms use to respond to each of the types of material weaknesses indicated by the COSO model and report this breakdown in Columns D-F of Table 7.[12] To determine whether there is a relationship between the type of material weakness and the response strategy, we conduct a χ^2 test of independence and a logistic regression. Results of the χ^2 test indicate that there is no relationship between the type of material weakness and response strategy (test statistic of 4.397 with a critical value of 16.919 at α=0.05). Results of logistic regression analysis found in Table 8 indicate that the type of material weakness is not a significant determinant of the response strategy used.

To address the second part of research question two to determine whether the type of material weakness reported is related to the correction of the material weakness, we analyzed the material weakness companies' 10-K reports following the initial disclosure of material weaknesses.[13] Thirty-five of the 133 material weakness firms still reported material weaknesses as of the end of 2006. Table 9 reports the results of the analysis. Of the original 603 reported weakness, 114 COSO instances (approximately 19%) still existed. At the end of 2006, 43 instances remained in the control activities category and 66 instances in the information and communication category. Ten percent (15 of 150) of the COSO instances for the non-corrective action firms still remained at the end of 2006. Ten of these material weaknesses were in the information and communication category.

Table 8: Logistic Regression Results for 133 Material Weakness Firms Probability that the Type of Material Weakness is Related To the Response Strategy

	Dependent Variable: MWRES	
Independent Variables	Coefficients	p-values
Intercept	-1.817	0.269
Total Assets (Ln)	-0.968	0.008***
Cash Flow to Assets	-0.531	0.651
Altman-Z (decile rank)	-0.103	0.348
Firm Age	0.102	0.001***
5-year Asset Growth	-7.043	0.002***
Firm Beta	0.9	0.034**
Business Segments (Ln)	-1.574	0.026**
Foreign Currency Adjustment (BIN)	-0.222	0.733
Institutional Ownership	0.017	0.254
Auditor (BIN)	1.613	0.043**
COSOCA	-0.578	0.525
COSOCE	0.573	0.511
COSOIC[1]	-0.154	0.866

- Total Assets, Cash Flow to Total Assets, Altman Z-Score, Asset Growth, Business Segments, Foreign Currency Adjustment, Institutional Ownership, and Auditor were obtained from Compustat. Beta was obtained from CRSP and Firm Age was obtained from Lexis Nexis.
- MWRES is an indicator variable that is equal to 1 if the firm used a non-corrective action strategy for the particular material weakness and 0 if the firm used a corrective action strategy. See Table 1 for a description of each of the image restoration strategies. Table 3 contains descriptions and sources of each variable.
- COSOCA is a binary variable that is equal to 1 if the material weakness was in the control activities category and 0 otherwise.
- COSOCE is a binary variable that is equal to 1 if the material weakness was in the control environment category and 0 otherwise.
- COSOIC is a binary variable that is equal to 1 if the material weakness was in the information and communication category and 0 otherwise.

[1] There were not enough occurrences in the risk assessment category to include in the regression analysis.

** Indicates significance at the 0.05 level

*** Indicates significance at the 0.01 level

TABLE 9: Material Weaknesses Classified by COSO's Components of Internal Control
Number of Material Weaknesses Remaining after 2006

Component	Description of Material Weakness	# of Material Weaknesses All Firms (n=133 firms)	# of Material Weaknesses Remaining After 2006 Annual Report All Firms	# of Material Weaknesses Non-Corrective Action Firms (n=35 firms)	# of Material Weaknesses Remaining After 2006 Annual Report Non-Corrective Action Firms
Control Environment	Reorganization, tone, board	34	4	12	1
Risk Assessment	Risk Assessment	5	1	1	0
Control Activities	Period End Reporting/Accounting	72	9	19	3
	Recording, Executing Transactions—Account Specific:				
	Income taxes	40	8		
	Inventory	16	4		
	Other	32	7	18	1
	TOTAL	88	19	18	1
	Revenue Recognition	38	6	13	0
	Technology, Spreadsheets, Control	31	5	6	0
	Segregation of Duties	16	3	6	0
	Stock Options	12	1	4	0
	TOTAL	257	43	66	4
Information and Communication	Training				
	Training/Staffing	144	35	29	4
	Training for Complex Transactions	21	3	5	2
	TOTAL	165	40	34	6
	Review Procedures	69	18	20	2
	Documentation, Communication	45	5	9	2
	Subsidiary Specific	29	3	17	0
	TOTAL	308	66	75	10
Monitoring	*None reported in this area*				
	TOTAL for FIVE COMPONENTS	603	114	150	15

A χ^2 test of independence indicates that there is no significant relationship between the type of material weakness and the correction of the material weaknesses in subsequent periods. The χ^2 statistic of 3.125 for the type of material weakness is less than the critical value of 7.815 (degrees of freedom =3 and α=0.05) which indicates we accept the null hypothesis of independence. We also conduct a logistic regression analysis to determine if the type of material weakness (COSO coding) is related to the correction of the material weakness. We find that firms with higher profitability and higher market risk are more likely to fix material weaknesses, but that the type of material weakness is not significantly related to the fact that the material weaknesses have been corrected. Results are found in Table 10. We find that the correction of material weaknesses in general is related to company characteristics rather than the type of material weakness.

CONCLUSION

The enactment of SOX represents far-reaching reforms in financial reporting practices. SOX Section 404 requires firms to perform an analysis of their internal controls relating to financial reporting and to report any material weaknesses to their investors.

Using Benoit's (1995) image restoration typology, this study indicates that when management reports internal weaknesses, firms are most likely to communicate their intended corrective action to eliminate these weaknesses in the future; however, our examination reveals that, in some instances, management uses strategies other than corrective action including denial, evasion of responsibility, and reducing the offensive act. We believe that strategies other than corrective action could signal to stakeholders that management may not be willing to take responsibility for correcting problems that created the material weaknesses or that management is unwilling to establish and maintain disclosure controls over financial reporting as mandated by SOX. This data could assist regulators and users of these financial statements in understanding how strategies other than corrective action may signal future problems for the firm. If management uses similar strategies in other financial reporting disclosures, users may have concerns about whether management is fairly reporting the company's economic reality.

Results of this study also indicate that firms using corrective action strategies are younger and faster growing than those firms that use other response strategies. The SEC has delayed full Section 404 compliance for smaller companies (those with less than $75 million in public equity) because these audit rules impose disproportionate expenses on these firms. To further assist small companies with their 404 compliance, COSO has issued framework guidance for small business issuers. These results indicate that it is important for regulators to devise a system by which small companies can comply with 404 at a relatively low cost.

TABLE 10: Logistic Regression Results for 133 Material Weakness Firms
Probability that the Type of Material Weakness is Related to Material Weakness Correction

	Dependent Variable: MWFIX	
Independent Variables	**Coefficients**	**p-values**
Intercept	2.921	0.073*
Total Assets (Ln)	-0.059	0.786
Cash Flow to Assets	1.987	0.056*
Altman Z (decile rank)	-0.035	0.635
Firm Age	-0.012	0.581
5-year Asset Growth	0.131	0.904
Firm Beta	0.791	0.011**
Business Segments (Ln)	0.521	0.178
Foreign Currency Adjustment (BIN)	0.657	0.137
Institutional Ownership	0.002	0.858
Auditor (BIN)	-0.529	0.351
COSOCA	-1.499	0.204
COSOCE	-0.113	0.879
COSOIC[1]	-1.371	0.245

- Total Assets, Cash Flow to Total Assets, Altman Z-Score, Asset Growth, Business Segments, Foreign Currency Adjustment, Institutional Ownership, and Auditor were obtained from Compustat. Beta was obtained from CRSP and Firm Age was obtained from Lexis Nexis.
- MWFIX is an indicator variable that is equal to 1 if the material weakness has been fixed and 0 if not.
- COSOCA is a binary variable that is equal to 1 if the material weakness was in the control activities category and 0 otherwise.
- COSOCE is a binary variable that is equal to 1 if the material weakness was in the control environment category and 0 otherwise.
- COSOIC is a binary variable that is equal to 1 if the material weakness was in the information and communication category and 0 otherwise.

[1] There were not enough occurrences in the risk assessment category to include in the regression analysis.

* Indicates significance at the 0.10 level

** Indicates significance at the 0.05 level

Statistical results indicate that the use of a corrective action strategy and the type of material weaknesses disclosed are not significantly correlated. Additionally, we find that the correction of material weaknesses in general is related to company characteristics rather than the type of material weakness or the strategy used to respond to the material weakness.

Management has the ultimate responsibility for mandating that internal controls meet the objectives defined by COSO. Identified material weaknesses in internal control require that management respond to these weaknesses by taking actions such as hiring qualified accounting staff, revising policies and procedures, increasing the amount and level of staff training, and hiring outside

consultants when necessary. In effect, management must communicate their willingness to use these corrective actions and avoid a potential crisis from a material weakness.

Further research can determine whether other industries use similar responses in reporting their internal control weaknesses. Alternatively, future studies could address the types of responses that firms use in communicating other potentially negative information to their stockholders; and if any correlation exists with more defensive responses and earnings quality, fraud, earnings management, or restatements. Certain strategies may be indicators to stockholders or auditors of other potential problems that exist within the firm.

ENDNOTES

[1] Section 404 (Enhanced Financial Disclosures, Management Assessment of Internal Control) became effective for accelerated filers for fiscal years ending after November 15, 2004. Non-accelerated filers are scheduled to begin including a management report on internal control over financial reporting in annual reports filed for the fiscal year ending on or after December 15, 2007 and an auditor's report in internal control over financial reporting for a fiscal year ending on or after December 15, 2009. (SEC 2008)

[2] SIC codes 3570-3579 (computer software and hardware), 3670-3679 (electronic components and accessories), and 7370-7379 (electronics) (Ge and McVay 2005).

[3] Accelerated filers are companies with market capitalizations of at least $75 million, who have filed at least one annual report under Section 13(a) or 15(d) of the Exchange Act, and who are not eligible to file quarterly or annual reports on Forms 10-QSB or 10-KSB (SEC 2004).

[4] Twenty-two of the 133 material weakness firms in our sample were non-accelerated filers that voluntarily complied with SOX 404. We included the non-accelerated filers in our sample because even though they were not required to report material weaknesses under Section 404, they chose to do so and therefore are material weakness firms. We ran all statistical analyses with and without the non-accelerated filers and there were no differences in results. For the remainder of the paper, the non-accelerated filers are included in the analysis.

[5] The distributions of these variables are highly skewed, so the Wilcoxon/Mann-Whitney Equality of Medians Test was used to compare the medians of the material weakness firms with those of the computer industry.

[6] A correlation analysis of the variables indicates high levels of correlation between variables used as proxies for the same characteristic (i.e. book value, market capitalization, and total assets are highly correlated and are all used as proxies for firm size). There are no other notable correlations between variables.

[7] Ashbaugh-Skaife, et al. (2007) add firm age to their model in a sensitivity test with only non-accelerated filers and find that age is not a significant determinant of internal control deficiency disclosure.

[8] A univariate analysis was conducted using the variables in Table 3 to determine statistical differences between firms using a corrective action strategy and those using other response strategies. Most relationships were insignificant, however the non-corrective action firms displayed higher sales growth, but lower asset growth than firms using a corrective action strategy.

[9] We looked at all 10-K's through 2006. For some firms, this was two years beyond their initial disclosure of material weaknesses, for some firms it was one year.

[10] Certain types of material weaknesses are easy to remedy and would likely have been fixed regardless of the communication strategy used. Thus, the correction of the material weakness may have been an optimal operating strategy rather than an image restoration strategy.

[11] Results of the logistic regression were similar when other measures for size, profitability, and growth were used. Results were also comparable when we winsorized the continuous variables at 1 and 99 percent. We also ranked the continuous variables into deciles and used their decile ranks in the logit regression with similar results.

[12] The totals in Columns D and E do not equal the totals in Table 4 because there are a larger number of COSO responses than image restoration responses. For comparison and statistical analysis purposes, we associated response strategies with specific COSO incidences.

[13] We looked at all 10-K's through 2006. For some firms, this was two years beyond their initial disclosure of material weaknesses, for some firms it was one year.

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THE IMPACT OF THE SARBANES-OXLEY ACT ON PRIVATE DEBT CONTRACTING

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ABSTRACT

This paper examines whether aspects of debt contracting have been affected by the provisions of the Sarbanes-Oxley Act of 2002 that increased monitoring of management's activities by independent directors, auditors and regulators. Using a sample of 4,610 new private debt contracts, I document a significant decrease in the cost of debt after the implementation of Sarbanes-Oxley, after controlling for other influencing factors. I also show that small firms and growth firms experienced a relatively greater reduction in the cost of debt with the increase in monitoring, consistent with greater levels of information asymmetry or uncertainty associated with these firms and thus with Sarbanes-Oxley having a greater impact on them. Overall, the findings in this study suggest that increased monitoring induced by Sarbanes-Oxley had a significant impact on contracts in the private debt market.

INTRODUCTION

The purpose of this paper is to investigate whether an association exists among monitoring, debt covenants, and the cost of debt and whether it has been affected by certain provisions of the Sarbanes-Oxley Act of 2002 (hereafter SOX). I also examine whether the increased monitoring that resulted from SOX differentially affected firms with certain characteristics, such as size or presence of growth options.

The agency costs of debt arise because of conflicts between shareholders and debtholders and are mainly due to asset substitution and underinvestment problems which occur after the debt contract is finalized. Jensen and Meckling (1976) posit that shareholders have incentives to invest in high variance projects, i.e., risky and high expected return projects, at the expense of debtholders (asset substitution). Alternatively, Myers (1977) argues that shareholders have incentive to underinvest in positive net present value (NPV) projects because the positive expected NPV fails to cover previously promised debt repayments (underinvestment). To mitigate shareholder-bondholder agency costs, bondholders use three devices – monitoring, debt covenants, and cost of debt – to protect themselves from managerial opportunism. Thus, an exogeneously mandated increase in monitoring should produce less reliance on the other two methods, debt covenants and cost of debt, for reducing agency costs.

In this paper, I examine whether the event of increased regulatory monitoring produced less reliance on debt covenants, the cost of debt or both. To accomplish my objective, I compare the number of debt covenants and the cost of debt for private debt contracts during the pre-SOX and post-SOX periods. Using data on private debt issued during the 1999-2005 time period (specifically a sample of 4,610 facilities), I empirically examine the association among monitoring, debt covenants, and the cost of debt. I focus on private debt because, by its nature, private debt is more likely to have restrictive covenants than public debt (Kwan and Carleton, 2004). Due to the large number of bondholders involved in a public debt issue, renegotiating a debt contract following a debt covenant violation can be costly and difficult. Thus, private debt contracts generally contain a greater number of debt covenants than public debt contracts making it easier to examine the association among monitoring, debt covenants, and cost of debt in private debt contracts.

In the analysis that follows, I rely on the definition of monitoring in Jensen and Meckling (1976) (Jensen and Meckling define monitoring as more than just measuring or observing the behavior of the agent. It includes efforts on the part of the principal to "control" the behavior of the agent through various activities. I define "monitoring" in terms of broad measure which includes all internal and external monitoring that affects agent's behavior to reduce his or her discretion) and the specific provisions in SOX that increase the monitoring of public companies, especially Title II "Auditor Independence," Title III "Corporate Responsibility," and Title IV "Enhanced Financial Disclosures."

Previous studies on debt contracts document only the association between monitoring and debt covenants (Black et al., 2004) or the association between debt covenants and the cost of debt (Beatty et al., 2002). Black et al. (2004) find a negative relationship between monitoring and the frequency of debt covenants. In particular, they document decreases in the use of debt covenants during the periods of increased monitoring. In addition, Beatty et al. (2002) find a negative relationship between the inclusion of debt covenants and the cost of debt. They argue that managers are willing to bear higher interest rates to retain accounting flexibility. I extend the work in these two studies by evaluating a broader set of variables that are used to mitigate agency costs between shareholders and debtholders. Specifically, I hypothesize that during the period of increased monitoring induced by SOX (i.e., post-SOX period), the number of debt covenants or the cost of debt will decrease in private debt contracts due to interaction effects among monitoring, debt covenants, and cost of debt. In addition, I hypothesize that small firms and growth firms will demonstrate a much greater impact from the implementation of SOX because the Act will reduce conflicts between shareholders and debtholders more for high information-asymmetry firms.

The empirical results are generally consistent with my hypotheses. I find a statistically significant decrease in the cost of debt after the implementation of SOX. However, I do not find evidence that the usage of debt covenants decreased during the post-SOX period. The results indicate that exogeneously mandated monitoring produces less reliance on the cost of debt but not on debt covenants. In addition, I find evidence that, on average, small firms and growth firms are

more influenced by increased monitoring due to SOX. These results are consistent with my hypothesis that firms with higher information asymmetry were more influenced by SOX.

The results demonstrated in this paper make a number of contributions to our understanding of debt contracting. First, this paper examines the association among all three devices that are used to minimize the conflicts between shareholders and debtholders. Prior research has only found evidence of an association between monitoring and debt covenants (Black et al., 2004) and an association between debt covenants and the cost of debt (Beatty et al., 2002). This paper is the first to study the relationships among all three methods. Second, while most previous studies related to SOX focused on stock price reactions and corporate governance issues (Berger et al., 2004; Jain and Rezaee, 2004; Li et al., 2004; Zhang, 2005), this paper addresses the impact of the SOX on debt contracts. Finally, this paper provides a foundation for future work on the relations between monitoring, debt covenants, and the cost of debt.

The remainder of the paper is organized as follows. Section 2 develops the hypotheses and presents the empirical models used to investigate the relation between monitoring, debt covenants, and the cost of debt. Section 3 describes the sample, data sources, and variable measurements. Section 4 provides descriptive statistics. Section 5 presents correlation analysis and my primary results. It also examines a potential endogeneity problem and presents instrumental variable approach results. Finally, in section 6, I conclude.

HYPOTHESES DEVELOPMENT AND EMPIRICAL MODELS

Herein are developed each of the principal hypotheses based on the impact of the increased monitoring imposed by SOX and the regression models used. The first two hypotheses consider the association among the three most important components of debt contracts: monitoring, debt covenants, and the cost of debt. The next two hypotheses consider whether the increased monitoring due to SOX had different effects based on the size of the firm or its growth options.

Prior empirical work on debt contracts shows that when the level of regulatory monitoring increases, banks in their role as borrowers reduce their use of debt covenants intended to reduce agency costs (Black et al., 2004). They argue that regulatory monitoring and debt covenants both strive to limit a bank's default risk, and since regulatory monitoring cannot be controlled by bank shareholders, they try to minimize the agency costs by substituting monitoring through debt covenants where debt covenants and regulatory monitoring intersect. SOX's provisions force increased levels of inside and outside monitoring on firms. For example, Section 202 requires that all auditing services and all permitted non-auditing services to be pre-approved by the client company's independent audit committee, Section 302 requires each public company's CEO and CFO to certify that they have reviewed the quarterly and annual reports their companies file with the SEC, and Section 403 requires most transactions by insiders to be electronically filed with the SEC within two business days. In the presence of this additional monitoring, lenders and borrowers may be able to reduce the number and type of covenants employed. I examine whether this

substitution effect between monitoring and debt covenants can be generalized by expanding the sample of firms to include other industries besides banks, as examined in Black et al. (2004).

In addition, I develop a second hypothesis based on prior research in managerial opportunism. Jensen and Meckling (1976) suggest that covenants are included in debt contracts as a strategy for restricting managerial opportunism. They argue that by agreeing to restrict future opportunistic behavior, borrowers can reduce their current borrowing costs. Thus, the borrower faces a trade-off between retaining the possibility of future opportunistic behavior and obtaining a lower interest rate. Beatty et al. (2002) find evidence that borrowers are willing to pay substantially higher interest rates to retain accounting flexibility that may help them avoid covenant violations.

Black et al. (2004) only investigate the association between monitoring and debt covenants. While prior study (Beatty et al., 2002) suggests that the cost of debt and debt covenants could be substitutes, I hypothesize that there is also a substitution effect between monitoring and the cost of debt. For example, if the cost of debt increases and the number of debt covenants decreases at the same time, we cannot attribute the decreased number of debt covenants solely to the effect of increased monitoring. (Like most previous studies on debt covenants, I do not measure the tightness of debt covenants due to the cost of accessing actual debt covenant information. Prior studies use proxies such as debt-equity ratio (Duke and Hunt, 1990; Press and Weintrop, 1990; DeFond and Jiambalvo, 1991), direct measurements of covenant slack (Dichev and Skinner, 2002), or number of covenants (Black et al., 2004; Begley and Feltham, 1999) for measuring the tightness of debt covenants. Begley and Feltham (1999) find evidence that the existence and tightness of the covenants are highly positively correlated.) Thus, I expect increased monitoring to affect debt covenants, the cost of debt, or both. Because of its increased monitoring requirements, SOX should have altered the use of debt covenants and the cost of debt in post-SOX debt contracts. This leads to my first and second hypotheses (in alternative form):

Hypothesis 1: *The number of debt covenants is likely to decrease, ceteris paribus, during the post-SOX period.*

Hypothesis 2: *The cost of debt is likely to decrease, ceteris paribus, during the post-SOX period.*

I test these hypotheses by estimating (1) a logistic regression model and (2) a multiple regression model in which either debt covenants or spread is the dependent variable. Ten covariates are included to control for other potentially relevant explanatory factors, discussed below. The model is as follows:

$$\begin{aligned} Prob[Cov=1] = logit(&\alpha_0 + \alpha_1 SOX_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 LEV_{i,t} + \alpha_4 VAR_{i,t} + \alpha_5 GROWTH_{i,t} \\ &+ \alpha_6 RATING_{i,t} + \alpha_7 MAT_{i,t} + \alpha_8 AMOUNT_{i,t} + \alpha_9 COL_{i,t} + \alpha_{10} SPREAD_{i,t} \\ &+ \alpha_{11} TBOND_{i,t}) \end{aligned} \quad (1)$$

$$SPREAD_{i,t} = \beta_0 + \beta_1 SOX_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 VAR_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 RATING_{i,t} + \beta_7 MAT_{i,t} + \beta_8 AMOUNT_{i,t} + \beta_9 COL_{i,t} + \beta_{10} COV_{i,t} + \beta_{11} TBOND_{i,t} \quad (2)$$

where *i* refers to the facility (facility is a tranche of a private debt offer) and *t* refers to the time of issuance. Variable definitions are as follows:

COV	= dummy variable set equal to one if the debt covenant is included in debt contract, zero otherwise.
SOX	= an indicator variable, which is a proxy for monitoring set equal to one if the sample period is in the post-SOX period; zero if the sample period is in the pre-SOX period.
SIZE	= natural log of total assets of firm at quarter-end.
LEV	= ratio of long-term debt to total assets at quarter-end.
VAR	= 5 years earnings variability prior to the debt contract; computed as the standard deviation of firm *i*'s net income before extraordinary items (scaled by total assets) measured over rolling five year windows.
GROWTH	= market-to-book ratio; computed as market value of equity divided by total book value of equity.
AMOUNT	= total amount of money (scaled by total assets) that the firm borrowed in debt contract.
MAT	= stated maturity calculated in years.
RATING	= Moody's senior debt ratings information on each loan facility; ratings of Aaa, Aa, A, Baa, Ba, B, and lower than B represents 1 through 7, respectively.
COL	= dummy variable set equal to one if the loan is secured; zero otherwise.
SPREAD	= basis point spread over LIBOR inclusive of all fees, which is a proxy for cost of debt. In general, this spread is fixed over the life of the loan.
TBOND	= 5 year Treasury bond rate.

The dummy variable, denoted *SOX*, is set equal to one for the post-SOX period and zero for the pre-SOX period to determine whether there were any changes in debt contracts before and after the implementation of the Act. I expect that this *SOX* variable, which is the main variable of interest, would be significantly negative due to the additional monitoring requirements associated with SOX. As a control variable, I use natural log of total assets, denoted as *SIZE*, to proxy for the size of the firm. Small firms are generally viewed as more risky to creditors, so I expect this *SIZE* variable to have a negative relationship with the dependent variables. In addition, large firms may be better able to manage risk, so firm size may affect interest rate choice.

Interest rates on loans are extremely sensitive to default risk. As a proxy for the loan's credit risk, I use Moody's senior debt ratings information on each loan facility, as provided in the *Dealscan* database, denoted by *RATING*. I code *RATING* into 1 through 7 to represent the ratings of Aaa, Aa, A, Baa, Ba, B and lower than B. Higher default risk (a higher value of debt rating) is related to higher interest rate and more debt covenants; therefore, I expect a positive relation between *RATING* and dependent variables.

Debt contracts are also affected by the leverage of the firm. Capital Structure Theory suggests that at relatively low debt levels, the probability of bankruptcy and financial distress is low and the benefit from debt outweighs the cost. However, as the debt level increases, the possibility of financial distress also increases, so the benefit from debt financing may be more than offset by the financial distress costs. Thus, the interest rate does not have a linear relationship with the firm's leverage, making it hard to predict whether leverage will have a positive or negative relationship with dependent variables. This difficulty is compounded because different firms and industries have different optimal levels of leverage. The variable *LEV* is the ratio of long-term debt over total capital (debt plus equity), and I do not predict a sign for α_3 or β_3.

I use the standard deviation of the firm's return on assets (scaled by total assets) over the past five years, denoted by *VAR*, rather than the stock price variations to measure the variability of the firm's performance. Because debtholders usually look at the firm's earnings stability rather than the stock price movements, earnings variability is assumed to be a better proxy for measuring risk. Therefore, I expect *VAR* to have a positive relationship with dependent variables. Other control variables are debt characteristic variables such as the cost of debt, total amount of debt, maturity and whether the loan has collateral. Since debt covenants and cost of debt are substitutes (that is, when debt covenants increase, interest rates decrease and vice versa), I expect *SPREAD* to have a negative relationship with *COV*. The debt contract is also affected by its maturity, the total amount of the loan and whether it is secured by collateral. I expect *MAT* to have a positive relationship with dependent variables because longer maturity debt is riskier farther in the future because of increased uncertainty of repayment. Collateral allows the lender to recover, at least partially, the principal. When the borrower fails to make a promised payment, the lender can sell the collateral, thus reducing the likelihood or amount of loss on debt. Therefore, I expect a negative relationship between *COL* and *SPREAD* because if the debt contract is secured by collateral, the cost of debt should be lower. However, a number of prior studies have found a positive relation between the existence of collateral and the cost of debt (Berger and Udell, 1990; John et al., 2003). Berger and Udell (1990) and John et al. (2003) suggest that lower quality firms are required to use collateral when issuing debt, while higher quality firms are able to issue without it.

In addition, a firm's growth opportunities are reflected in the market-to-book ratio. Growth firms have more intangible assets whose valuation depends heavily on future profitability. Therefore, I expect higher market-to-book ratio (i.e., growth firms), denoted by *GROWTH*, to have a positive relationship with *SPREAD*. To control for the effects of extreme values, I remove those observations that have negative or zero book value.

During my sample period, economic environments were unstable, and to capture the macro-economic factors, I obtained five-year Treasury-bond rates from the United States Department of the Treasury (http://www.treasury.gov).

Since SOX contains substantive reforms with respect to financial reporting, we would expect it to have a significant impact on reducing information asymmetry. In particular, firms that significantly manage earnings should be impacted differently than firms that do not manage earnings. In the bond market, as in the stock market, the risk premium is different depending on the level of information asymmetry. The level of information asymmetry for small firms is more likely to be reduced than for large firms as a result of SOX. Thus, the relative reduction in the risk premium on debt contracts is likely to be greater for smaller firms, and thus, I expect a greater reduction in the cost of debt issued during the post-SOX period for smaller firms.

As just noted, prior studies show that the level of information asymmetry differs between small firms and large firms. For example, Lakonishok and Lee (2001) find that insider purchases in smaller firms predict future returns, but this predictive power does not hold for larger firms. Similarly, Finnerty (1976) and Seyhun (1986) find insider profits are larger for smaller firms. If firm size is proxy for information asymmetry and information asymmetry is greater in smaller firms, then the results of Lakonishok and Lee (2001), Seyhun (1986), and Finnerty (1976) suggest insider profits are larger when greater information asymmetry is present. A recent paper by Bharath et al. (2006) also documents that small borrowers have greater information asymmetries. In addition, Dixon et al. (2006) posit that because small businesses are likely to be less diversified and less able to leverage economies of scale or to access capital markets, the cost of complying with a particular regulation may be different for smaller and larger firms. Thus, my third hypothesis is (in alternative form):

Hypothesis 3: *Small firms are more likely to have a greater relative reduction in the cost of debt after the passage of SOX than larger firms.*

Barclay and Smith (1995) suggest that a firm's future investment opportunities may be viewed as options whose value depends on the likelihood that the firm will exercise the options optimally. Therefore, the contracting costs due to underinvestment and asset substitution are higher for firms with more growth options because the conflict between shareholders and bondholders over the exercise of the options is greater. Shareholders of high-growth firms can more easily substitute riskier projects for less risky ones and are also more susceptible to foregoing positive NPV projects if the gains accrue predominantly to the bondholders. That is, management may invest in high-risk negative NPV projects that increase the value of the equity but decrease the value of the debt. Consistent with my third hypothesis, if we expect the Sarbanes-Oxley Act to have a significant impact on reducing information asymmetry, then it should have a greater impact on firms that have more growth options because the conflict between shareholders and bondholders is greater for such

firms, and greater conflict means that the level of information asymmetry is greater for these firms. Thus, when the information asymmetry is reduced due to Sarbanes-Oxley, the risk premium of debt contracts will decrease. This leads to my fourth hypothesis (in alternative form):

Hypothesis 4: *Firms with higher growth options are more likely to have a greater relative reduction in the cost of debt after the passage of SOX than firms with lower growth options.*

I test my third and fourth hypotheses by extending the multiple regression model that I used to test the second hypothesis. I include two interaction terms to determine the impact of SOX on variables of interest (*SIZE* and *GROWTH*). The model is as follows:

$$\begin{aligned} SPREAD_{i,t} = {} & \gamma_0 + \gamma_1 SOX_{i,t} + \gamma_2 SIZE_{i,t} + \gamma_3 LEV_{i,t} + \gamma_4 VAR_{i,t} + \gamma_5 GROWTH_{i,t} \\ & + \gamma_6 RATING_{i,t} + \gamma_7 MAT_{i,t} + \gamma_8 AMOUNT_{i,t} + \gamma_9 COL_{i,t} + \gamma_{10} COV_{i,t} \\ & + \gamma_{11} TBOND_{i,t} + \gamma_{12} (SOX*SIZE)_{i,t} + \gamma_{13} (SOX*GROWTH)_{i,t} \end{aligned} \quad (3)$$

SAMPLE SELECTION

The data for this analysis is drawn from three sources (*Dealscan*, Quarterly and Annual *Compustat*, and the United States Department of Treasury). I collect debt characteristic variables from *Dealscan* (See Dichev & Skinner, 2002 for a discussion of the Dealscan database), firm characteristic variables from *Compustat*, and a macroeconomic control variable from the United States Department of Treasury (http://www.treasury.gov). I first draw the initial sample of firms that issued debt during the period from January 1999 to December 2005. I define the three year period from January 1999 to December 2001 as the pre-SOX period and the three year period from January 2003 to December 2005 as the post-SOX period. Because of the news coverage, the market should have known about SOX in 2002, although not about the exact provisions of the Act, before it was actually signed by President Bush. Therefore, if the market participants were rational, we should assume that the debt contracts could have been affected by SOX during this period. Thus, I set the one-year period from January 2002 to December 2002 as a transition period.

Typically, loan deals are broken into individual facilities. Each of the facilities is a representation of a different tranche of the total loan. The facilities differ in terms of maturity and spread. They also differ in terms of debt covenants and structure. From *Dealscan*, only newly issued facilities and the details of the contract for each facility, such as amount of loan issued, interest rate (spread), date of issue, date of maturity, Moody's senior debt rating, collateral, and information about debt covenants, were collected during the sample period. I assigned a score of one if the debt contract had certain types of debt covenants (either the financial debt covenants or general debt covenants) and zero otherwise. In addition, I assigned a score of one if the facility had collateral and zero otherwise. The sample selection process is described in Table 1. Since *Dealscan* does not offer

CUSIP numbers, ticker symbols are used for matching with *Compustat*. Annual *Compustat* was used to calculate earnings variability. I eliminate firms that had zero or negative book value of equity.

Table 1. Sample selection
This table presents the sequential filters applied to obtain the final sample of firm-quarters

	Number of Observations Remaining
Number of facilities during the sample period	35,358
Facilities with ticker symbols	13,962
Combine with quarterly Compustat	8,346
Combine with annual Compustat	4,668
Elimination of outliers in *GROWTH* variable	4,610

DESCRIPTIVE STATISTICS

Panel A of Table 2 reports the means, medians, and standard deviations for variables used in the multiple regressions. As shown in Panel A of Table 2, the sample of 4,610 facilities exhibits considerable variation in firm size and borrowing amount. There were total of 1,000 firms in my data sample. There were 792 firms that issued debt during the pre-SOX period and 938 firms that issued debt during the post-SOX period. Firm size during the sample period ranges from a minimum of $3 million to a maximum of $242 billion. Facility amount during the sample period ranges from a minimum of $0.1 million to a maximum of $25 billion. The sample debt issues are quite large. The median amount issued is $175 million. The facilities in my sample appear to be risky. The median credit rating of 7 indicates that more than half of the sample contracts are entered into by below-investment-grade borrowers. This is mainly because *Dealscan* consists of only private debt. A previous study on debt choice by Denis and Mihov (2003) shows that public borrowers are larger and have higher credit ratings than firms borrowing from either banks or non-bank private lenders. Their findings suggest that firms with the highest credit quality borrow from public sources, firms with medium credit quality borrow from banks, and firms with the lowest credit quality borrow from non-bank private lenders. Thus, my sample is actually downward biased in terms of size and credit quality because of the nature of the private debt market and the limitation of my database. In addition, slightly less than half of the facilities in my sample required collateral and more than half had some type of covenants, either financial covenants or general covenants.

Table 2. Descriptive statistics for sample firm-quarters

Panel A. Descriptive statistics for regression variables

This table provides descriptive statistics for variables used in subsequent tests. To be included in this table, a firm-quarter observation must be accompanied by sufficient data to compute the variables displayed below. The statistics for all variables are based on 4,610 firm-quarter observations. Firm-quarter observations are drawn from the period between 1999 and 2005, excluding 2002.

	Obs.	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
Spread	4,610	173.914	134.206	62.5	150	250
Size (in millions)	4,610	7335.5	14186.8	500.411	2031.9	8248.05
Leverage	4,610	0.2785	0.1612	0.1654	0.2693	0.3780
Earnings Variability	4,610	93.4753	542.569	1.9217	6.4552	28.1173
Market-to-Book Ratio	4,610	3.1285	5.4069	1.3076	2.0152	3.3740
Facility Amount (in millions)	4,610	384.95	792.38	55.00	175.00	425.00
Maturity	4,610	3.4592	1.9843	1.0833	3.1727	5
Moody's Rating	4,610	6.2460	1.3483	6	7	7
Collateral	4,610	0.4440	0.4969	0	0	1
Debt Covenants	4,610	0.7536	0.4310	1	1	1
5-year T-bond Rate	4,610	4.3160	1.1458	3.43	4.08	5.07

To examine the differences between debt contracts for firms that borrowed during the pre-SOX period and those that borrowed during the post-SOX period, I first divide the sample into two groups: pre-SOX and post-SOX. Panel B of Table 2 shows the different characteristics between firms that borrowed during the pre-SOX and post-SOX periods by using two-sample *t*-tests. Panel B of Table 2 presents the differences in spread, size, leverage, earnings variability, market-to-book ratio, and other characteristics between the two sub-samples. Private debt issued during the post-SOX period typically has larger spread, is highly leveraged, has longer maturity, is less risky, and has more collateral and more debt covenants than the debt issued during the pre-SOX period. Specifically, maturity and debt covenants are significantly different while spread, leverage, Moody's rating, and collateral are only marginally significant. In addition, the 5-year T-bond rate for pre-SOX firms is significantly higher than the rate for post-SOX firms, which shows that there were large economic fluctuations during the sample period. The difference between 5-year T-bond rates shows that the economic environment has changed dramatically during these periods. During my sample period, the highest 5 year T-bond rate was 6.83% on May 8, 2000 and the lowest 5 year T-bond rate was 2.08% on June 13, 2003. However, Panel B of Table 2 shows that firm size, earnings variability, market-to-book ratio, and the amount of borrowing are not statistically different between the two sub-samples.

Table 2. Descriptive statistics for sample firm-quarters								
Panel B. Difference in characteristics between pre-SOX and post-SOX								
	Pre-SOX			Post-SOX			Test of Difference	
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	*t*-statistics	*p*-value
Spread	169.597	140	131.888	177.349	150	135.949	-1.96	0.0506
Size (in millions)	7050.59	1873.63	13677.18	7562.25	2150.5	14578.33	-1.23	0.2205
Leverage	0.2739	0.2657	0.1606	0.2823	0.2728	0.1617	-1.76	0.0792
Earnings Variability	79.606	6.758	471.379	104.513	6.3012	593.012	-1.59	0.1122
Market-to-Book Ratio	3.077	1.916	4.7149	3.170	2.0578	5.9005	-0.59	0.5525
Facility Amt (in millions)	365.25	150	935.84	400.63	200	655.93	-1.45	0.1474
Maturity	3.0489	2.9979	2.1189	3.7857	4.1676	1.8052	-12.51	<.0001
Moody's Rating	6.2898	7	1.3898	6.2111	7	1.3136	1.95	0.0507
Collateral	0.4288	0	0.4950	0.4562	0	0.4982	-1.86	0.0630
Debt Covenants	0.7186	1	0.4498	0.7815	1	0.4133	-4.89	<.0001
5-year T-bond Rate	5.3602	5.32	0.7810	3.4849	3.52	0.5601	91.42	<.0001

The mean spread for firms in the pre-SOX period is 169 basis points while the mean spread for firms in the post-SOX period is 177 basis points, marginally significantly higher at the 10% level. Also, firms in the pre-SOX period have an average of 3.05 years of duration, while the maturity for post-SOX firms is 3.78 years which is significantly longer.

RESULTS

Correlation Analysis

I present Pearson correlation coefficients for the pooled regression variables in Table 3. The correlation between *SPREAD* and *SOX* indicates that the cost of debt for debt contract has increased during the post-SOX period. The marginally significant change in *SPREAD* seen in Table 2, Panel B also indicates the increase in interest rates. The variable *SIZE* is significantly correlated with several variables. *SIZE* is positively correlated with *LEV*, *AMOUNT*, and *RATING* and negatively correlated with *SPREAD*, *MAT*, *COL*, *COV*, and *TBOND*. This positive relationship indicates that (at least in my sample) large firms are more leveraged and borrow more money per facility than small firms. The negative relationship indicates that the debt contracts for large firms have lower interest rates, shorter maturities, are more often unsecured, and have fewer restrictive debt covenants

than those of small firms. The significantly positive correlation between *GROWTH* and *SPREAD* indicates that growth firms are viewed as more risky; thus the cost of debt is higher for growth firms. In addition, the significantly positive correlation between *GROWTH* and *RATING* also indicates that the growth firms have lower credit ratings, which is consistent with growth firms being more risky. The variable *AMOUNT* is significantly negatively correlated with *SPREAD*, *SIZE*, *MAT*, *RATING*, *COL*, and *COV*. This indicates that the firm that borrows a lot of money from a one-time deal generally has a low interest rate, has shorter maturity, has quite low credit risk, is unsecured, and has fewer debt covenants on the deal.

Table 3 also reveals that many explanatory variables are significantly correlated with each other. The formal hypotheses tests are based on logistic and multiple regression analysis.

Table 3. Pearson correlation matrix

This table provides the value of the correlation between each of the variables used in subsequent tests. To be included in this table, a firm-quarter observation must be accompanied by sufficient data to compute the variables displayed below. Therefore, the statistics for all variables are based on 4,610 firm-quarter observations. Firm-quarter observations are drawn from the period between 1999 and 2005, excluding 2002. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.1 levels, respectively. Variable definitions are as follows: **SPREAD**=basis point spread over LIBOR, inclusive of all fees. **SOX**=indicator variable set equal to one if the sample period is in the pre-SOX period; zero if the sample period is in the post-SOX period. **SIZE**=natural log of total assets of firm at quarter-end. **LEV**=ratio of long-term debt to total assets at quarter-end. **VAR**=5 years earnings variability prior to debt contract; computed as the standard deviation of firm *i*'s net income before extraordinary items (scaled by total assets) measured over rolling five year windows. **GROWTH**=market-to-book ratio; computed as market value of equity divided by total book value of equity. **RATING**=Moody's senior debt ratings information on each firm; ratings of Aaa, Aa, A, Baa, Ba, B, and lower than B represents 1 through 7, respectively. **MAT**=stated maturity computed in years. **AMOUNT**=amount of money borrowed in debt contract scaled by total assets. **COL**=dummy variable set equal to one if the loan is secured, zero otherwise. **COV**=dummy variable set equal to one if the debt covenant is included in debt contract, zero otherwise. **TBOND**=5 year Treasury bond rate.

	SPREAD	SOX	SIZE	LEV	VAR	GROWTH	RATING	MAT	AMOUNT	COL	COV	TBOND
SPREAD	1.000											
SOX	0.0290	1.000										
	0.0514											
SIZE	-0.265***	0.018	1.000									
	<.0001	0.2239										
LEV	0.154***	0.0260	0.098***	1.000								
	<.0001	0.0794	<.0001									
VAR	-0.040***	0.023	0.014	-0.055***	1.000							
	0.0064	0.1216	0.3418	0.0002								
GROWTH	0.098***	-0.016	-0.008	0.012	-0.014	1.000						
	<.0001	0.2834	0.5824	0.4085	0.3304							
RATING	0.123***	-0.029**	0.096***	0.011	-0.054***	0.045***	1.000					
	<.0001	0.0492	<.0001	0.4484	0.0003	0.0021						
MAT	0.173***	0.184***	-0.211***	0.145***	-0.021	0.011	0.005	1.000				
	<.0001	<.0001	<.0001	<.0001	0.1611	0.4484	0.7386					

Table 3. Pearson correlation matrix

AMOUNT	-0.261***	0.002	0.240***	0.002	0.024	-0.0290	-0.101***	-0.074***	1.000			
	<.0001	0.132	<.0001	0.8955	0.1023	0.0504	<.0001	<.0001				
COL	0.548***	0.0270	-0.292***	0.104***	-0.0250	0.005	0.111***	0.261***	-0.217***	1.000		
	<.0001	0.063	<.0001	<.0001	0.0853	0.7369	<.0001	<.0001	<.0001			
COV	0.205***	0.073***	-0.134***	0.044***	-0.009	-0.035**	0.059***	0.165***	-0.066***	0.427***	1.000	
	<.0001	<.0001	<.0001	0.0029	0.5327	0.0164	<.0001	<.0001	<.0001	<.0001		
TBOND	-0.053***	-0.813***	-0.167***	-0.0270	-0.023	0.004	-0.073***	-0.072***	-0.004	-0.030	-0.085***	1.000
	0.0003	<.0001	<.0001	0.0622	0.1176	0.8071	<.0001	<.0001	0.7756	0.0446	<.0001	

Logistic and Multiple Regression Results

In Table 4, I report logit regression results for dichotomous dependent variable *COV*. Consistent with prior research (Beatty et al., 2002), I find evidence that debt covenants and the cost of debt have a negative relationship. However, the main variable of interest is *SOX*, a dichotomous variable set to one if the year is in the post-SOX period, and logit regression results in Table 4 show no evidence that the use of debt covenants decreased during the post-SOX period. I next turn to the results in Table 5 to determine whether the cost of debt decreased due to increased monitoring in the post-SOX period.

I present the estimation results of the multiple regressions for 4,610 firm-quarter observations in Table 5. The variable of interest in these regressions is again *SOX*. Model 1 in Table 5 reports the univariate analysis between *SPREAD* and *SOX*. Consistent with Panel B of Table 2 and Table 3, the univariate analysis between *SPREAD* and *SOX* indicates that the cost of debt has increased during the post-SOX period. I include all of the control variables in the Full Model in Table 5. The results of estimating the Full Model show that the sign of the coefficient on *SOX* is significantly negative, suggesting that greater monitoring is associated with a lower cost of debt capital after controlling for firm and debt characteristic variables.

Table 4. Logit regression results based on 4,610 firm-quarter observations

This table provides the results of logit regression with the dependent variable COV. To be included in this table, a firm-quarter observation must be accompanied by sufficient data to compute the variables displayed below. Therefore, the statistics for all variables are based on 4,610 firm-quarter observations. Firm-quarter observations are drawn from the period between 1999 and 2005, excluding 2002. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.1 levels, respectively. Variable definitions are as follows: **COV**=dummy variable set equal to one if the debt covenant is included in debt contract, zero otherwise. **SOX**=indicator variable set equal to one if the sample period is in the pre-SOX period; zero if the sample period is in the post-SOX period. **SIZE**=natural log of total assets of firm at quarter-end. **LEV**=ratio of long-term debt to total assets at quarter-end. **VAR**=5 years earnings variability prior to debt contract; computed as the standard deviation of firm *i*'s net income before extraordinary items (scaled by total assets) measured over rolling five year windows. **GROWTH**=market-to-book ratio; computed as market value of equity divided by total book value of equity. **RATING**=Moody's senior debt ratings information on each firm; ratings of Aaa, Aa, A, Baa, Ba, B, and lower than B represents 1 through 7, respectively. **MAT**=stated maturity computed in years. **AMOUNT**=amount of money borrowed in debt contract scaled by total assets. **COL**=dummy variable set equal to one if the loan is secured, zero otherwise. **SPREAD**=basis point spread over LIBOR, inclusive of all fees. **TBOND**=5 year Treasury bond rate.

Table 4. Logit regression results based on 4,610 firm-quarter observations

$$Prob[COV=1] = logit(\alpha_0 + \alpha_1 SOX_{i,t} + \alpha_2 SIZE_{i,t} + \alpha_3 LEV_{i,t} + \alpha_4 VAR_{i,t} + \alpha_5 GROWTH_{i,t} + \alpha_6 RATING_{i,t} + \alpha_7 MAT_{i,t} + \alpha_8 AMOUNT_{i,t} + \alpha_9 COL_{i,t} + \alpha_{10} SPREAD_{i,t} + \alpha_{11} TBOND_{i,t})$$

				Dependent Variable		
Independent Variables		**Predicted Sign**		**COV**		
				Coefficient	Chi-Square	
Intercept				1.299	9.40	***
SOX		—		-0.122	0.78	
SIZE		—		-0.025	2.33	
LEV		+/—		0.093	0.12	
VAR		0		0.000	0.00	
GROWTH		0		-0.035	1.67	
RATING		0		0.032	1.39	
MAT		0		0.075	12.96	***
AMOUNT		+/—		-0.002	0.41	
COL		—		2.896	462.15	***
SPREAD		—		-0.001	12.45	***
TBOND		?		-0.224	14.26	***
Obs.				4,610		
Chi-square				5.1910		
p-value				0.7370		
R-square				0.2030		

Table 5. Multiple regression results based on 4,610 firm-quarter observations

This table provides the results of multiple regression with the dependent variable SPREAD. To be included in this table, a firm-quarter observation must be accompanied by sufficient data to compute the variables displayed below. Therefore, the statistics for all variables are based on 4,610 firm-quarter observations. Firm-quarter observations are drawn from the period between 1999 and 2005, excluding 2002. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.1 levels, respectively. Variable definitions are as follows: **SPREAD**=basis point spread over LIBOR, inclusive of all fees. **SOX**=indicator variable set equal to one if the sample period is in the pre-SOX period; zero if the sample period is in the post-SOX period. **SIZE**=natural log of total assets of firm at quarter-end. **LEV**=ratio of long-term debt to total assets at quarter-end. **VAR**=5 years earnings variability prior to debt contract; computed as the standard deviation of firm *i*'s net income before extraordinary items (scaled by total assets) measured over rolling five year windows. **GROWTH**=market-to-book ratio; computed as market value of equity divided by total book value of equity. **RATING**=Moody's senior debt ratings information on each firm; ratings of Aaa, Aa, A, Baa, Ba, B, and lower than B represents 1 through 7, respectively. **MAT**=stated maturity computed in years. **AMOUNT**=amount of money borrowed in debt contract scaled by total assets. **COL**=dummy variable set equal to one if the loan is secured, zero otherwise. **COV**=dummy variable set equal to one if the debt covenant is included in debt contract, zero otherwise. **TBOND**=5 year Treasury bond rate.

Table 5. Multiple regression results based on 4,610 firm-quarter observations

$$SPREAD_{i,t} = \beta_0 + \beta_1 SOX_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 VAR_{i,t} + \beta_5 GROWTH_{i,t} + \beta_6 RATING_{i,t} + \beta_7 MAT_{i,t} + \beta_8 AMOUNT_{i,t} + \beta_9 COL_{i,t} + \beta_{10} COV_{i,t} + \beta_{11} TBOND_{i,t}$$

Independent Variables	Predicted Sign	Model (1)			Full Model			Extended Model		
		Coefficient	*t*-stat		Coefficient	*t*-stat		Coefficient	*t*-stat	
Intercept		169.597	57.14	***	199.696	10.69	***	205.887	10.97	***
SOX	—	7.752	1.95	0	-29.160	-4.94	***	-50.588	-5.42	***
SIZE	—				-9.014	-12.83	***	-11.516	-12.05	***
LEV	+/—				97.078	9.54	***	95.281	9.43	***
VAR	0				-0.004	-1.29		-0.004	-1.29	
GROWTH	0				3.757	7.28	***	13.038	9.36	***
RATING	0				6.830	5.61	***	6.187	5.11	***
MAT	0				0.360	0.41		0.339	0.39	
AMOUNT	+/—				-0.567	-2.99	***	-0.596	-3.16	***
COL	—				132.310	34.73	***	130.846	34.51	***
COV	—				-12.439	-3.02	***	-13.032	-3.18	***
TBOND	?				-17.590	-6.83	***	-16.111	-6.24	***
SOX*SIZE	0							5.225	4.16	***
SOX*GROWTH	—							-10.772	-7.20	***
Obs.		4,610			4,610			4,610		
Adj. R-square		0.0006			0.3473			0.3570		

Consistent with my second hypothesis, shareholders appear to be substituting a reduced cost of debt for increased monitoring in the post-SOX period. The main variable of interest, *SOX*, is significantly negative, and its magnitude suggests a decrease of 29 basis points in the firm's cost of debt during the post-SOX period, after controlling for other factors. The signs of the coefficients on the control variables are generally consistent with my predictions except the variable *COL*. The relationship between the cost of debt and collateral is opposite to my prediction, but consistent with other previous empirical studies (Berger and Udell, 1990; John et al., 2003). Berger and Udell (1990) and John et al. (2003) posit that the positive association between the cost of debt and collateral might arise because lenders require collateral on lower quality firms. Careful examination of the results in Tables 4 and 5 together shows that monitoring is a substitute for the cost of debt but not debt covenants. Hence, I conjecture that the lenders might be willing to maintain a certain minimum level of debt covenants. Beatty et al. (2002) posit that borrowers are willing to pay

substantially higher interest rates to retain accounting flexibility. Since the number of debt covenants has not decreased in the post-SOX period, I conjecture that the result may be due to the lender's willingness to maintain debt covenants at a certain level.

The Extended Model in Table 5 shows the result of the extended multiple regression model, which I use to test hypotheses 3 and 4. I extend the previous multiple regression model by including two interaction terms, which are *SOX*SIZE* and *SOX*GROWTH*. If the increased post-SOX monitoring influenced the cost of debt, this regression should show what kind of firms are more (or less) affected by increased monitoring. The coefficient for *SOX*SIZE* is significantly positive. This means that in the post-SOX period (i.e., when *SOX* is equal to one) the magnitude of the coefficient for *SIZE* variable is reduced, which is evidence that the gap between small and large firms has decreased. In the pre-SOX period alone, the coefficient for *SIZE* was -11.52, but in the post-SOX period, the magnitude of coefficient for *SIZE* increased to -6.29 (= -11.52 + 5.23). The coefficient for *SOX*GROWTH* is significantly negative. The magnitude of the coefficient for *GROWTH* is reduced because *SOX*GROWTH* has a negative sign which lowers the positive coefficient on *GROWTH* in the post-SOX period. Thus, the magnitude of coefficient for *GROWTH* has been decreased from 6.18 to -4.58 (= 6.19 – 10.77) indicating that because of the increased monitoring, growth firms are more affected than value firms, which is consistent with hypothesis 4.

In order to test the direct impact of monitoring and increase the power of my tests, I use the firm as its own control in the next analysis and examine only the firms that issued debt in both pre-SOX and post-SOX periods. A total of 730 firms (2,940 facilities) issued debt in both periods. Table 6 shows that the main interest variable, *SOX*, is significantly negative, indicating that the cost of debt has decreased in the post-SOX period which is consistent with previous results and my hypotheses.

Table 6. Multiple regression results based on 2,940 firm-quarter observations (sample includes only the firms that issued both pre-SOX and post-SOX period)

This table provides the results of multiple regression with the dependent variable SPREAD. To be included in this table, a firm-quarter observation must be accompanied by sufficient data to compute the variables displayed below. Therefore, the statistics for all variables are based on 2,940 firm-quarter observations. Firm-quarter observations are drawn from the period between 1999 and 2005, excluding 2002. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.1 levels, respectively. Variable definitions are as follows: **SPREAD**=basis point spread over LIBOR, inclusive of all fees. **SOX**=indicator variable set equal to one if the sample period is in the pre-SOX period; zero if the sample period is in the post-SOX period. **SIZE**=natural log of total assets of firm at quarter-end. **LEV**=ratio of long-term debt to total assets at quarter-end. **VAR**=5 years earnings variability prior to debt contract; computed as the standard deviation of firm *i*'s net income before extraordinary items (scaled by total assets) measured over rolling five year windows. **GROWTH**=market-to-book ratio; computed as market value of equity divided by total book value of equity. **RATING**=Moody's senior debt ratings information on each firm; ratings of Aaa, Aa, A, Baa, Ba, B, and lower than B represents 1 through 7, respectively. **MAT**=stated maturity computed in years. **AMOUNT**=amount of money borrowed in debt contract scaled by total assets. **COL**=dummy variable set equal to one if the loan is secured, zero otherwise. **COV**=dummy variable set equal to one if the debt covenant is included in debt contract, zero otherwise. **TBOND**=5 year Treasury bond rate.

Table 6. Multiple regression results based on 2,940 firm-quarter observations (sample includes only the firms that issued both pre-SOX and post-SOX period)

$$SPREAD_{i,t} = \gamma_0 + \gamma_1 SOX_{i,t} + \gamma_2 SIZE_{i,t} + \gamma_3 LEV_{i,t} + \gamma_4 VAR_{i,t} + \gamma_5 GROWTH_{i,t} + \gamma_6 RATING_{i,t} + \gamma_7 MAT_{i,t} + \gamma_8 AMOUNT_{i,t} + \gamma_9 COL_{i,t} + \gamma_{10} COV_{i,t} + \gamma_{11} TBOND_{i,t} + \gamma_{12} (SOX * SIZE)_{i,t} + \gamma_{13} (SOX * GROWTH)_{i,t}$$

Independent Variables	Predicted Sign	Full Model			Extended Model		
		Coefficient	*t*-stat		Coefficient	*t*-stat	
Intercept		180.734	8.48	***	178.298	8.21	***
SOX	—	-20.658	-3.03	***	-35.383	-2.91	***
SIZE	—	-10.588	-11.64	***	-12.747	-10.71	***
LEV	+/—	122.401	9.29	***	124.838	9.54	***
VAR	0	-0.002	-0.64		-0.002	-0.62	
GROWTH	0	2.577	4.91	***	25.245	6.60	***
RATING	0	6.489	4.80	***	5.553	4.12	***
MAT	0	0.782	0.75		1.222	1.18	
AMOUNT	+/—	-13.334	-5.98	***	-12.939	-5.83	***
COL	—	131.255	27.86	***	127.763	27.16	***
COV	—	-9.331	-2.00	**	-10.908	-2.36	**
TBOND	?	-13.964	-4.74	***	-12.378	-4.21	***
SOX*SIZE	0				4.848	3.17	***
SOX*GROWTH	—				-23.110	-5.99	***
Obs.		2,940			2,940		
Adj. R-square		0.3780			0.3874		

Table 7. Multiple regression results based on 1,694 firm-quarter observations (sample includes only the small firms with a market capitalization of $700 million or less)

This table provides the results of multiple regression with the dependent variable SPREAD. To be included in this table, a firm-quarter observation must be accompanied by sufficient data to compute the variables displayed below. Therefore, the statistics for all variables are based on 1,694 firm-quarter observations. Firm-quarter observations are drawn from the period between 1999 and 2005, excluding 2002. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.1 levels, respectively. Variable definitions are as follows: **SPREAD**=basis point spread over LIBOR, inclusive of all fees. **SOX**=indicator variable set equal to one if the sample period is in the pre-SOX period; zero if the sample period is in the post-SOX period. **SIZE**=natural log of total assets of firm at quarter-end. **LEV**=ratio of long-term debt to total assets at quarter-end. **VAR**=5 years earnings variability prior to debt contract; computed as the standard deviation of firm *i*'s net income before extraordinary items (scaled by total assets) measured over rolling five year windows. **GROWTH**=market-to-book ratio; computed as market value of equity divided by total book value of equity. **RATING**=Moody's senior debt ratings information on each firm; ratings of Aaa, Aa, A, Baa, Ba, B, and lower than B represents 1 through 7, respectively. **MAT**=stated maturity computed in years. **AMOUNT**=amount of money borrowed in debt contract scaled by total assets. **COL**=dummy variable set equal to one if the loan is secured, zero otherwise. **COV**=dummy variable set equal to one if the debt covenant is included in debt contract, zero otherwise. **TBOND**=5 year Treasury bond rate.

Table 7. Multiple regression results based on 1,694 firm-quarter observations (sample includes only the small firms with a market capitalization of $700 million or less)

$$SPREAD_{i,t} = \gamma_0 + \gamma_1 SOX_{i,t} + \gamma_2 SIZE_{i,t} + \gamma_3 LEV_{i,t} + \gamma_4 VAR_{i,t} + \gamma_5 GROWTH_{i,t} + \gamma_6 RATING_{i,t} + \gamma_7 MAT_{i,t} + \gamma_8 AMOUNT_{i,t} + \gamma_9 COL_{i,t} + \gamma_{10} COV_{i,t} + \gamma_{11} TBOND_{i,t} + \gamma_{12} (SOX * SIZE)_{i,t} + \gamma_{13} (SOX * GROWTH)_{i,t}$$

Independent Variables	Predicted Sign	Full Model			Extended Model		
		Coefficient	*t*-stat		Coefficient	*t*-stat	
Intercept		117.849	2.48	**	127.585	2.73	***
SOX	—	-25.197	-2.37	**	-78.188	-4.80	***
SIZE	—	3.843	2.41	**	-3.598	-1.75	0
LEV	+/—	59.684	3.69	***	57.123	3.59	***
VAR	0	-0.008	-0.70		-0.010	-0.81	
GROWTH	0	2.583	4.63	***	11.541	7.49	***
RATING	0	17.132	3.43	***	15.977	3.25	***
MAT	0	-1.310	-0.84		-1.455	-0.95	
AMOUNT	+/—	-0.499	-2.46	**	-0.541	-2.71	***
COL	—	126.934	18.13	***	123.344	17.82	***
COV	—	-32.665	-3.68	***	-29.474	-3.37	***
TBOND	?	-16.956	-3.71	***	-12.999	-2.84	***
SOX*SIZE	0				15.646	5.19	***
SOX*GROWTH	—				-10.313	-6.27	***
Obs.		1,694			1,694		
Adj. R-square		0.2304			0.2564		

The Securities and Exchange Commission (SEC) allowed extended deadlines to July 15, 2007 for Sarbanes-Oxley compliance for small public companies (Wall Street Journal, September 22, 2005). The SEC defines a small company as one with a market capitalization of $700 million or less. Since the implementation of SOX was delayed for small public firms, I expect it will have less impact on these firms compared to the full sample. I find 1,694 observations that satisfy the condition of having market capitalization of $700 million or less. Table 7 shows that consistent with my expectation, the statistical evidence of *SOX* variable becomes weaker compared to Table 5 and Table 6 (i.e., *t*-statistic is only -2.37 in Table 7 compared to -4.94 and -3.03 in Table 5 and Table 6, respectively).

Instrumental Variable (IV) Approach

Debt contracting between two parties, lender and borrower, simultaneously determines cost of debt, debt covenants, maturity of debt, collateral, and amount of debt. Thus, the choice of one decision variable will affect the other, creating a potential endogeneity problem in the research design. It is well known that an endogeneity problem causes Ordinary Least Squares (OLS) regressions to be biased and inconsistent (Wooldridge, 2002). If the equations are estimated by OLS, there is potentially a problem of simultaneity bias because changes in maturity, collateral, amount, and debt covenant variables may affect one another and also affect the dependent variable. In addition, these explanatory variables could be correlated with the error term due to measurement error. This misspecification causes the parameter estimates to be inconsistent, which weakens the interpretation of the results presented in Table 5. Therefore, I use the instrumental variables (IV) approach to address the joint determination of the debt characteristic variables and to check the robustness of the basic results. Specifically, I employ the Two-Stage Least Squares (2SLS) method as follows: I first regress endogenous variables (debt characteristics) on each of the instruments and the exogenous variables (firm characteristics) to obtain fitted values for the endogenous variables (i.e., debt's maturity, borrowing amount, collateral, and debt covenant). Then, I substitute these fitted values for the endogenous variables and estimate the coefficient of the full model. To summarize, I obtain fitted values using a reduced form regression of debt characteristics in equation (4), then use equation (5) to obtain an unbiased and consistent estimator.

$$DC = f(FC, IV) \quad (4)$$

$$SPREAD = g(FC, SOX, TBOND, \check{DC}) \quad (5)$$

where DC represents debt characteristic variables, FC represents firm characteristic variables, IV represents an instrument, and $\check{DC}$ represents fitted values of debt characteristic variables obtained from equation (4).

Loan agreements contain contractual provisions called debt covenants that require the borrower to maintain minimum levels of working capital, interest coverage, or other key accounting-based measures that provide a safety net to the lender. Debt covenants are clearly related to the credit characteristics of the borrower. Therefore, I use the current ratio as an instrumental variable for debt covenants. The most important requirement for using instrument variables is that z should be correlated with x. Instrumental variables are highly correlated with endogeneous variables. There correlations are 0.0539 (debt covenant and current ratio), 0.0736 (collateral and inverse of PPE), 0.2184 (maturity and yield curve), and 0.1772 (amount borrowed and R&D expense). I also tried other instruments but none of them satisfied the correlation requirement. For example, I used debt to cash flow, interest coverage, debt to equity for debt covenants, tangible asset ratio for collateral, and financing needs (following Jalilvand and Harris, 1984) for amount borrowed.

As stated by Dichev and Skinner (2002), the current ratio is the most standardized, unambiguous accounting measure and one of the most frequently violated debt covenants. For firms that have debt covenants in their debt contracts, violations of those debt covenants will result in renegotiation costs and increases in the cost of debt capital. Firms without debt covenants in their debt contracts will not necessarily suffer such repercussions if other factors are not in place. Therefore, the firm's current ratio and the existence of debt covenants will be highly correlated because the presence of debt covenants results in a higher probability that firms will suffer financially due to renegotiation costs and the increased cost of debt. Firms that have debt covenants, then, should be more careful not to violate these covenants by maintaining higher levels of current ratio. In addition, debt covenants generally require firms to meet certain financial ratios, such as a minimum current ratio level. Since current ratio covenants are the most frequently used covenants, the current ratio of a firm that has debt covenants in its debt contract is likely to be higher than the current ratio of a firm that does not have debt covenants in its debt contract.

Tangible assets like equipments, buildings, and lands can be used as collateral in debt contracts. Banks require collateral when the firm does not have enough tangible assets. Since debtholders have first claims to a firm's tangible assets, debtholders could liquidate the firm and get their portion of the tangible assets in case of bankruptcy. Thus, if the firm has enough tangible assets, debtholders have no need to worry about securing the loan. Therefore, I use the inverse of property, plant, and equipment as an instrumental variable for collateral.

Next, I use the yield curve as an instrument for debt maturity. The yield curve is normally upward sloping. That is, the interest rates for more distant maturities are normally higher than the interest rates for closer maturities, due to the risks associated with time. Thus, as maturity gets longer, the yield (i.e., Treasury bond rate) tends to be higher. Shortening loan maturity limits the risk, which results in lower spreads and fewer covenants.

Finally, I use research and development expense as an instrument for the amount of the loan. Firms that spend more on their research and development have more financing needs and thus borrow more. Firms generally engage in research and development to generate future investments.

Table 8. Instrumental Variable approach results based on 4,610 firm-quarter observations

This table provides the results of instrumental variable estimation approach with the dependent variable SPREAD. To be included in this table, a firm-quarter observation must be accompanied by sufficient data to compute the variables displayed below. Therefore, the statistics for all variables are based on 4,610 firm-quarter observations. Firm-quarter observations are drawn from the period between 1999 and 2005, excluding 2002. ***, **, and * denote two-tailed significance at the 0.01, 0.05, and 0.1 levels, respectively. Variable definitions are as follows: **SPREAD**=basis point spread over LIBOR, inclusive of all fees. **SOX**=indicator variable set equal to one if the sample period is in the pre-SOX period; zero if the sample period is in the post-SOX period. **SIZE**=natural log of total assets of firm at quarter-end. **LEV**=ratio of long-term debt to total assets at quarter-end. **VAR**=5 years earnings variability prior to debt contract; computed as the standard deviation of firm *i*'s net income before extraordinary items (scaled by total assets) measured over rolling five year windows. **GROWTH**=market-to-book ratio; computed as market value of equity divided by total book value of equity. **RATING**=Moody's senior debt ratings information on each firm; ratings of Aaa, Aa, A, Baa, Ba, B, and lower than B represents 1 through 7, respectively. **fit(MAT)**=fitted value of maturity using yield curve as an instrument. **fit(AMOUNT)**=fitted value of amount borrowed using research and development as an instrument.

Table 8. Instrumental Variable approach results based on 4,610 firm-quarter observations

fit(COL)=fitted value of collateral using inverse of property, plant, and equipment as an instrument. **fit(COV)**=fitted value of debt covenant using current ratio as an instrument. **TBOND**=5 year Treasury bond rate.

$$SPREAD_{i,t} = \upsilon_0 + \upsilon_1 SOX_{i,t} + \upsilon_2 SIZE_{i,t} + \upsilon_3 LEV_{i,t} + \upsilon_4 VAR_{i,t} + \upsilon_5 GROWTH_{i,t} + \upsilon_6 RATING_{i,t} + \upsilon_7 fit(MAT)_{i,t} + \upsilon_8 fit(AMOUNT)_{i,t} + \upsilon_9 fit(COL)_{i,t} + \upsilon_{10} fit(COV)_{i,t} + \upsilon_{11} TBOND_{i,t} + \upsilon_{12} (SOX * SIZE)_{i,t} + \upsilon_{13} (SOX * GROWTH)_{i,t}$$

Independent Variables	Predicted Sign	Full Model			Extended Model		
		Coefficient	*t*-stat		Coefficient	*t*-stat	
Intercept		69.085	14.36	***	101.061	15.12	***
SOX	—	-47.473	-7.03	***	-96.935	-9.05	***
SIZE	—	-16.087	-19.53	***	-20.972	-19.24	***
LEV	+/—	148.006	12.45	***	143.554	12.19	***
VAR	0	-0.005	-1.38		-0.005	-1.36	
GROWTH	0	3.645	6.20	***	13.132	8.29	***
RATING	0	11.850	8.25	***	11.077	7.77	***
fit(MAT)	0	48.584	4.37	***	54.717	4.96	***
fit(AMOUNT)	+/—	-0.008	-0.57		-0.003	-0.23	
fit(COL)	—	39.072	0.74		13.837	0.27	
fit(COV)	—	164.390	1.95	0	138.085	1.65	0
TBOND	?	-44.604	-8.65	***	-43.982	-8.61	***
SOX*SIZE	0				10.070	7.04	***
SOX*GROWTH	—				-11.044	-6.49	***
Obs.		4,610			4,610		
Adj. R-square		0.1515			0.1683		

I present instrumental variable approach estimation results in Table 8. The inferences from the 2SLS analyses are similar to those derived from the multiple regression reported in Table 5. The results show that the coefficient of *SOX*, the main variable of interest, is again significantly negative at the 1% level. (To address possible industry effects due to using R&D expense as an instrument, I repeat the test using two-digit SIC codes as an additional control variable on the first stage regression. However, the results remain unchanged.) Consistent with the multiple regression results, the cost of debt appears to have decreased significantly during the post-SOX period. Thus, the

endogeneity problem does not affect the primary inferences drawn from Table 5, suggesting that the empirical results are robust to both procedures. However, the adjusted R-square has decreased from 34.73% to 15.15% in the Full Model (35.70% to 16.83% in Extended Model) compared to the OLS approach. One possible explanation for this is that it is difficult to find instruments that are perfectly correlated with endogeneous variables in the OLS regression.

CONCLUSION

This paper investigates the association among monitoring, debt covenants and the cost of debt for a sample of 4,610 private debt contracts that were issued between 1999 and 2005. While previous studies on debt contracts document only the association between monitoring and debt covenants (Black et al. 2004) or the association between debt covenants and the cost of debt (Beatty et al. 2002), I examine the association among all three (monitoring, debt covenants and cost of debt) and how they were affected by certain provisions of Sarbanes-Oxley Act of 2002.

I find evidence that, on average, during the post-SOX period where monitoring increased relative to the pre-SOX period, the cost of debt decreased. However, I do not find evidence that the number of debt covenants decreased during the post-SOX period. These results suggest that lenders substitute monitoring for borrowing costs. In addition, they suggest that the debtholders are willing to maintain debt covenants at a certain level.

I also examine the types of firms that are more likely to be influenced by increased monitoring during the post-SOX period and find that small firms and growth firms in particular are most affected, resulting in greater relative reductions in their cost of debt. These results are consistent with my hypothesis that firms with higher information asymmetry were significantly more affected by Sarbanes-Oxley. In addition, I provide evidence that small public companies with market capitalization of $700 million or less were only marginally affected by increased monitoring right after the passage of the Act, consistent with the SEC's decision to delay implementation for these firms.

Overall, the analysis in this paper provides evidence that the Sarbanes-Oxley Act of 2002 not only influenced the stock market but also the debt market. As such, it contributes to the literatures that examine the agency costs of debt and the economic impacts of the Sarbanes-Oxley Act and provides a foundation for future work on the relations between monitoring, debt covenants and the cost of debt.

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RISK PREDICTION CAPABILITIES OF P/E DURING MARKET DOWNTURNS

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ABSTRACT

Beta is a widely used measure of risk in the financial markets, frequently used by analysts, investors, managers, banks, and government agencies to assess the risk-return characteristics of a financial action. The purpose of this study to: (1) examine the reliability of using beta, given its fundamental role in the financial markets, and (2 test the merits of using the price-earnings ratio as a better indicator of risk during the negative price swings. The study employs cross sectional financial information of 9330 companies listed in NYSE and NASDAQ during the down turn period of 2008. The results of the study show significant evidence supporting the two research hypotheses.

INTRODUCTION

Stock market crashes shake the financial markets stability around the globe at each occurrence. The aftermath of these negative swings is devastating on investors. The stock market crash of 2000 destroyed more than $8 trillion of investors' wealth, for example (Nofsinger, 2001), while in 2008 the stock market lost more than 50% of its value with dramatic repercussions on the economy in general and on the investors in particular.

The purpose of this study is to identify a reliable measure of risk during periods of negative price swings. The study tests the reliability of one of the most widely used measures of risk, beta (ß), during such negative price swings and tests the predictive power of price-earnings ratio as an alternative to beta in measuring risk.

LITERATURE REVIEW

Researchers do not agree on the factors that causing these stock market downturns. Sornette (2003) argued that the major cause of the market crashes was the exaggerated expectations of future earnings by investors who overlooked the economic fundamentals--people invested in companies that promised high returns but whose financials were unable to meet these promises. Ofek and Richardson (2002), in discussing the stock crash market of the year 2000, discussed the wide gap between price and their fundamental values in the period that preceded the 2000 market freefall.

Zuckerman and Rao (2004) related the market crash of 2000 to the main features of trading in Technology stocks early in the 1990s, during which investors and stock traders were unable to explain the wide fluctuations in prices of Internet stock, and failed to predict its implications on the broader markets. Baigent and Massaro (2005), meanwhile, in their analysis of the 1987 market crash concluded that "portfolio insurance" was the most plausible explanation for the rapid downturn. They discussed the important role of derivative securities in contributing to the escalation of market capitalizations through the first nine months of 1987.

The capital pricing asset pricing model (CAPM) remains the most dominant theory in the investments literature, relating beta as a measure of relevant risk to the return from a financial asset. There is documented research, however, pointing to the use of financial measures as an explanatory variable in stock markets return analysis. Fama and French (1992), for example, showed evidence of the relationship between return and size, price-to-book ratio, and prior returns. The pointed to the incremental return with a risk component not explained in the assets pricing model. Aras and Yilmaz (2008) used price-earnings, dividend yield and market-to-book ratio to predict returns in emerging markets. Ang and Bekaert (2003) discussed the reliability of using price-earnings ratio to predict future dividend growth. In the same direction, Lamont (1998) argued that price-earnings ratio has independent predictive power for excess returns. Lewellen (2001) similarly highlighted the predictive power of financial ratios in determining returns.

Conventionally, however, beta remains the dominant measure of relevant systematic risk. This paper tests the reliability of using beta in predicting riskiness of investment in financial assets:

H_0: Beta is a reliable measure of risk.

Additionally, we examine the use of price-earnings ratio as an alternative measure:

H_0: Price-Earning ratio (P/E) is a predictive measure of risk.

RESEARCH MODEL

The purpose of the study is to examine the reliability of beta as a measure of risk by predicting the stock price movement during negative price swings and to test the predictive power of a price-earnings ratio as a measure of risk during the same period. The procedure used is to identify two groups of stocks (dependent variable). The first group consists of stocks that observed a sharp negative price movement during a crash period (Y = 0), and the second group are those stocks that did not have a negative sharp price movement during the same crash period (Y = 1). The independent variables are beta and price-earnings ratio, which are both used independently and jointly. The model requires the use of a non-metric dependent variable and metric independent variables in identifying these two groups of stocks.

We employ the Binary Logistic Regression Model (BLRM) used by Olujide (2000) to predict corporate financial distress using financial ratios. Logistic regression is superior to the linear regression model where normality assumptions of the independent variables are not met. It is simpler to read and to interpret because its values are bound to a range between zero and one (Tsun-Siou, Yin-Hua & Rong-Tze 2003).

Hence the logistic regression model is used to test the reliability of using beta (independent variable) in identifying the stock price movement during negative price swings, i.e. risk (dependent variable); as well as in evaluating the predictive power of price-earnings in classifying stocks into two groups (dependent variables): stocks that were adversely affected during negative price swings (assigned a binary value of 0); and stocks that were less adversely affected during negative price swings (assigned a binary value of 1).

Logistic model takes the following form:

$$Y(0-1) = A + B_1X_1 + B_2X_2$$

Reliability of the Model

In testing the reliability of the model, the two following measures are used:

Coefficient of Determination: is similar to that of the ordinary least squares (OLS) regression:

$$R^2_{Logit} = 1 - (2LL_0 / 2LL_1)^{1/2}$$

$2LL_0$ is the log-likelihood (represents unexplained variations) of the model without independent variables. $2LL_1$ is the log-likelihood of the research model based on the independent variables that remained in the model and exhibited significant power in explaining the two stock groups. N is the sample size. In general, the interpretation of R^2_{logit} is similar to the coefficient of determination R^2 in the multiple regressions. It has a value that ranges between 0 and 1; when R^2_{logit} approaches 0, the model is a poor predictor; when R^2_{logit} approaches 1, the model is a perfect predictor.

Hit Ratio: A Z test is performed to test the significance of hit ratio (percentage of correctly classifying the cases). The following formula is applied:

$$Z \text{ test} = [\, P - 0.5 \,] / [\, 0.5\,(1 - 0.5) / N \,]^{½}$$

where P = hit ratio = proportion correctly classified results, N = sample size.

The "Z-test" tests the significance of the hit ratio. The hit ratio measures the percentage of times the model accurately classifies the cases into the two stock groups i.e. if the model completely explains the dependent variable, the overall hit ratio would be 100%. A level of significance of 5% is used.

DATA COLLECTION

The data is taken from Compustat and covers a twelve-month-period ending October 31, 2008. The study includes the information of 9930 public firms that are traded at NYSE and NASDAQ.

Data Description and Measurement

The data are of two types:

Dependent variable, which is non-metric and reflects the change in prices:

Y(0) = Adversely affected stocks are defined (Risky) as stocks with a decline in price exceeding that of the two markets indices (The two indices declined by almost 50% during the reported period);

Y(1) = Stocks that were not adversely affected (Safe) and represents stocks with a decline in price below that of the average of the two indices.

Independent variables are metric--beta and price-earnings ratio. They are cross sectional type taken at the beginning of the crash period i.e. October 31, 2007.

DATA ANALYSIS

The testing was conducted using a scenario analysis of three steps. The 5% level of significance and enter method (SPSS) were used in the three scenarios.

Step one included beta as an independent variable to predict stock risk using the "Enter" method. Step two used the price-earnings ratio as an independent variable to predict risk. And step three included both beta and price-earnings ratio as measures of risk.

Table 1 shows the summary output of step 1with the following results:

Table 1: Beta				
		Observed	Predicted	Correctly classified
		0	1	
Risky stocks	0	3	3689	0.001
Safe stocks	1	3	4122	0.999
		Overall hit ratio		0.528

The number of cases removed from the model was 2,113, while the number of cases that remained in the model was 7817. The model correctly classified the stock price movement of 4125 cases, resulting in an overall hit ratio of 52.80%. However, the $R2_{logit} = 0$ and was insignificant.

The outcome of step 2 (Table 2) depicts the following:

Table 2 - Price- earnings ratio				
		Observed	Predicted	Correctly classified
		0	1	
Risky stocks	0	1840	1388	0.57
Safe stocks	1	983	2249	0.696
		Overall hit ratio		0.633

The number of cases removed from the model was 3,470, while the number of cases that remained in the model was 6,469. The model correctly classified the stock price movement of 4,089 cases, resulting in an overall hit ratio of 63.30%. However, the $R2_{logit} = 0.3\%$ and was significant at a level of 5%.

In step 3 where both beta and price earnings were entered into the model, the summary output (Table 3) signifies the following results:

Table 3 – Beta and Price- earnings ratio				
		Observed	Predicted	Correctly classified
		0	1	
Risky stocks	0	236	2532	0.085
Safe stocks	1	145	2803	0.951
		Overall hit ratio		0.532

The number of cases removed from the model was 4,214 and the number of cases that remained in the model was 5,716. The model correctly classified the stock price movement of 3,039 cases, resulting in an overall hit ratio of 53.20%. However, the $R2_{logit}$ = 0% and was insignificant at a level of 5%.

TESTING RELIABILITY

Testing the reliability of the model is done by using the following two measures:

1 Coefficient of determination (R-Square) value, which represents the proportion of unexplained variation that is explained by the independent variables. Table 4 shows that the coefficient of determination of price-earnings ratio scenario was significant, while it was insignificant for the other two scenarios;

Table 4- Coefficient of Determination - Measure

Measure	Nagelkerke R Squared	Alpha 5 %
Beta	0.00	Insignificant
Price-earnings	0.03	Significant
Beta and Price earnings	0.00	Insignificant

2 Testing the significance of hit ratio is done by using Z distribution. Z critical value at a level of significance of 5% is = 1.65, N = the number of cases included in the model. Table 5 shows that overall hit ratio of price-earnings ratio was significant.

Table 5- Significance of Hit ratio

Measure	Hit Ratio %	N	Z value	Critical Value	Result
Beta	52.8	7817	0.56	1.65	Insignificant
Price-earnings	63.3	6469	2.16	1.65	Significant
Beta and Price-earnings	53.2	5716	0.64	1.65	Insignificant

LIMITATION OF THE STUDY

There were two limitations in the study: (1) Missing cases--a number of cases in this study had missing variables and were removed from the study as reported in the three scenarios; (2) The external validity of the model was not tested.

CONCLUSIONS

The research output of the study was robust and showed that beta's power was insignificant in predicting stock price movements. It raised a serious question about using it as a measure of risk when it indeed unreliable. On the other hand, the price-earnings ratio exhibited significant power in predicting stock price movements and accordingly was a more reliable measure of risk.

This study poses a real dilemma that we need to address imminently. Should beta's role as the dominant measure of risk be continued? We recommend further research to test the external validity of this model by applying it to other stock markets and or different time frames.

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AUDIT PARTNERS' INDIVIDUAL RISK PREFERENCES IN CLIENT RETENTION DECISIONS

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ABSTRACT

Recent research has focused on audit firms' client portfolio management choices, assuming firms are motivated to reduce overall business risk consistent with Expected Utility Theory. However, Prospect Theory predicts individuals make risk seeking choices when faced with potential losses, perhaps including losing the revenue from terminating an existing client. This study examines the effect of individual audit Partners' risk preferences in the context of whether to retain or terminate a risky audit client. The results indicate individual Partners' risk attitudes have a significant effect on their decisions whether or not to retain a risky audit client. Implications for audit practice and future research are discussed.

INTRODUCTION

Prior research has shown auditors' decisions to accept clients are influenced by the auditors' perceptions of the client's business risk and the auditor's business risk (Johnstone 2000). These risks, in turn, are influenced by the perceived strengths and risks of various financial and nonfinancial information (Pratt and Stice 1994; Bell et al. 2002). Subsequent client portfolio decisions also are associated with auditor's business risk such as the client's business risk and likelihood of fraud ((Johnstone and Bedard 2003, 2004). Prior research has assumed auditors' client portfolio (i.e., acceptance and retention) decisions follow predictions of Expected Utility Theory, i.e., risk neutrality. However, Prospect Theory predicts individuals faced with a prospective loss will respond with risk seeking behavior. Prior research has not addressed the potential influence of auditors' individual risk aversion or risk seeking on business risk decisions when prospects for loss are salient.

The potential influence of individual-level differences in risk preference is important for several reasons. First, an aggressive, risk seeking approach to managing business risks can lead to increased liability judgments and settlements, impairing profitability for the firm at best, and to dissolution (as in the case of Arthur Andersen) at worst. Second, an overly cautious, risk averse approach can lead to reduced profitability as well, since profitable opportunities may be missed. Third, existing models for assessing business risks associated with client continuance do not

explicitly recognize and weight Partners' individual differences in risk assessment (Bell et al. 2002). Fourth, prior research suggests that group decision making, which one might expect to cancel out individual differences, may actually produce greater divergence instead of convergence in attitudes (Moscovici and Zavalloni 1969; Carnes et al. 1996). Fifth, to the extent individuals are unaware of the underlying differences in their assessments of risk, group discussions can be misdirected. For example, outward disagreement may focus on a client's audit or business risk (Johnstone 2000; Choi et al. 2004) when the underlying source of disagreement between two partners or groups of partners is the difference in the partners' own attitudes toward acceptable risk.

The purpose of this research is to test whether audit partners' individual risk preferences with respect to business risk evaluations affect their evaluations to retain or to terminate an existing, risky client. We extend recent experimental and empirical audit research on client portfolio management (Johnstone 2000; Johnstone and Bedard 2003, 2004; Hackenbrack and Hogan 2005) by including consideration of partners' individual risk preferences. We extend prior research (Farmer 1993) that has examined lower level auditors' risk preferences on audit risk by extending the inquiry to audit partners and business risk decisions.

This study provides the first evidence of the effects of individual audit partners' risk seeking, risk aversion, and risk neutrality attitudes in a business risk context. Our findings indicate partners' individual risk preferences have a significant influence on their client retention assessments. Partners who are risk averse (seeking) are more likely to assess a lower (higher) likelihood of retaining a risky audit client. Practically, our findings suggest that risk seeking tendencies inherent in potential loss situations should be explicitly recognized by audit partners and audit firm management committees so that this human tendency toward risk seeking in potential loss situations can be managed appropriately. Audit researchers should extend this research by investigating other business risk contexts to determine how risk seeking by audit partners affects their decision making.

The remainder of the paper is organized as follows. We review recent relevant research on client portfolio management and individual auditor risk preferences. Next, we state the research hypotheses and research methodology employed. Then, the results are described. Finally, the contributions and limitations are detailed.

LITERATURE REVIEW

Client Acceptance and Retention Decisions

The decision to accept and/or retain an audit client involves several criteria (Simunic 1980; Johnstone and Bedard 2003). These criteria include an assessment of the prospective client's managerial integrity (Ayers and Kaplan 1998; Johnstone 2000; Beaulieu 2001); financial condition (Pratt and Stice 1994); management controls and governance (Cohen and Hanno 2000); positions on financial reporting (Cohen and Trompeter 1998)[1]; the audit firm's independence, potential profitability, and staffing and expertise (Asare et al. 1994); and the credibility of risk information

provided by the contact partner (Cohen and Trompeter 1998). The decision process tends to be relatively unstructured, requiring the exercise of professional judgment (Ayers and Kaplan 2003). Greater experience among auditors produces more conservative client acceptance judgments (Ayers and Kaplan 1998, 2003).

Interviews with audit partners indicate three types of risks are considered in the evaluation of a prospective client: (1) the client's business risk, including consideration of the client's likely survival and profitability, (2) audit risk, the risk of material misstatement due to control weakness, and (3) the auditor's business risk, the potential litigation and other costs (Huss and Jacobs 1991). The completeness of procedures for assessing these risks and the level at which the decision is made, i.e., local vs. national, vary among international firms (Huss and Jacobs 1991).

Prior research has found auditors' evaluations of the probability of an audit failure, i.e., audit risk, and their perceptions of litigation risk are affected by the client's overall financial condition (Pratt and Stice 1994). Assessments of audit risk and client's business risk significantly affect auditors' perceptions of their own business risk, which, in turn, significantly affects their client acceptance decisions (Johnstone 2000) and audit pricing (Houston et al. 1999, 2005). Interestingly, Johnstone concludes audit partners' decisions appear to be based more on a desire to avoid risk than using risk-adaptation strategies to make riskier clients more acceptable.

To better manage risks associated with client acceptance and continuance decisions, one international firm analyzed 80 client acceptance/continuance decisions to develop a computerized decision aid (Bell et al. 2002). The analysis identified seven risk factors: (1) client entity characteristics that can affect auditor's business risk, (2) independence/relationship issues that can affect auditor independence issues, (3) third-party information related to the quality of the relationship with the client, (4) quantitative financial condition, (5) qualitative factors related to client operating characteristics, (6) the client's control structure, and (7) financial reporting and recent audit results. Calculations reflecting a complex weighting scheme produce a risk score from one to five (highest) intended to be used as a discussion tool for partners' decisions to add/retain the client.

Empirical analysis has shown expected fraud risk reduces client acceptance, but expected error risk has no effect (Johnstone and Bedard 2004). Acceptance is less likely if the client is highly levered or has a loss (Johnstone and Bedard 2003). Consistent with Johnstone's (2000) earlier finding, this firm did not respond to high client risk by planning to use more testing or by charging higher billing rates.

Individual client acceptance and continuance decisions affect the audit firm's resulting clientele. Empirical data reveal continuing clients of Big 6 firms have larger total assets, sales, profit margins, and cash flow to total liabilities ratios than departing clients (Choi et al. 2004) and less audit risk (Johnstone and Bedard 2004). These findings are consistent with interviews (Huss and Jacobs 1991) and experimental research (Johnstone 2000). Empirically, the principal difference between departing and new clients is that new clients are growing faster than departing clients (Choi et al. 2004).

Empirical research also confirms earlier experimental findings that auditors' business risk and client's business risk are related. Audit litigation subsequently reduces audit fees because the auditor's reputation suffers (Eu-Jin and Houghton 2000).

Prior research on audit firms' client portfolio management has found client acceptance and retention decisions are consistent with a goal to reduce overall business risk to the audit firm. This motive is consistent with Expected Utility Theory (von Neumann and Morgenstern 1953). As discussed in the next section, Expected Utility Theory has also been used to explain individual auditors' risk attitudes in evaluating audit risk.

Individual Risk Preferences

Prior research in auditing has reported that most audit Seniors and Managers (80 percent) tend to be risk averse (Farmer 1993). This finding is consistent with traditional societal perceptions of accountants as cautious (risk-averse) and with the traditional concept of conservatism that has had a favored position in generally accepted accounting principles (FASB 1990, SFAC 2 par. 91).

Farmer found audit Seniors' and Managers' individual risk preferences were highly correlated with their evaluations of the risks associated with a client's internal controls when evaluated on a within-subject basis. Interestingly, however, there was no difference in internal control assessments *across subjects* who were classified as risk averse or risk seeking. That is, risk averse auditors did not evaluate the internal control system as significantly more risky than risk seeking auditors when the internal control system was, in fact, more risky. Farmer suggested future research should examine whether individual risk preference significantly affects intended *behavior* as opposed to evaluations of *the degree of risk present* in a control system (1993, 108).

Auditors' individual risk seeking or aversion in Farmer's study was measured using a multi-attribute utility function based on Expected Utility Theory (Farmer 1993). Expected Utility Theory does not take into account that risk preferences can vary due to framing effects as described by Kahneman and Tversky's Prospect Theory.

Prospect Theory (Kahneman and Tversky 1979) is an alternative theoretical framework that has challenged traditional Expected Utility Theory. Kahneman and Tversky proposed Prospect Theory to explain judgments they found to be inconsistent with the notions of utility maximization (Expected Utility Theory). One aspect of Prospect Theory addresses the *framing* of options (Tversky and Kahneman 1981). Framing considers the decision-makers context for, and concept of, the decision problem. Different frames can result in different decisions. For example, in some situations individuals are risk *seeking* if a choice such as two alternative medical procedures are presented as having different mortality rates (a loss frame) but are risk *averse* if the same two procedures and equivalent odds are given for survival rates (a gain frame) (McNeil et al. 1982; Slovic and Lichtenstein 1983).

The choice *not* to retain an existing client also can be framed as the potential loss of continuing revenues from audit fees (i.e., a loss frame). Of course, overall business risk would be

expected to decrease as well. Whether or not the decrease in utility from the future lost revenues is greater or lesser than the increase in utility from the concomitant expected reduction in business risk will depend, in part, on each individual partner's unique risk preference. A risk seeking partner (or one who is less risk averse or one who is risk seeking because the situation is framed as a loss) will be less inclined to agree to discontinue an existing risky client than a more risk averse partner (or one who does not frame the situation as a loss).

Audit partners may view terminating an existing client as a loss of a valuable auditor-management relationship, as well as the loss of more profitable repeat business. In part for these reasons, Hackenbrack and Hogan (2005) found 76 percent of 222 audits they examined resulted in retaining the client over a five-year period. Therefore, overall, we expect audit partners will be reluctant to terminate a profitable relationship with an existing client and, ceteris paribus, most partners will likely frame client termination as a potential loss.

Prior research has concluded audit partners' acceptance and retention decisions are driven by desire to avoid risk (Johnstone 2000). Individuals who are risk averse are less likely to take chances. Given a reasonable degree of business risk, an audit partner who is risk averse is likely to favor ending the auditor-client relationship, but an audit partner who is risk seeking is likely to favor continuing the relationship. Thus, we examine the following hypothesis regarding audit partners' risk aversion (risk seeking) in client retention decisions:

H_A: Audit partners who are risk seeking (risk averse) will be more (less) likely to retain a risky client.

There are at least two reasons why H_A might not be supported. First, supplying audit partners with a closed set of decision cues for evaluating whether or not to retain a client might reduce the potential impact of differences across individual partners. Johnson et al. (1981), in a study of physicians, concluded that general domain experience does not significantly affect mean cue usage when individual decision makers are supplied with the necessary cues. As explained in the next section, our experimental materials included a set of eight decision cases similar to the method used by Johnson et al. If participants focus their attention solely on the available decision cues about the client's and auditor's business risks, individual differences may not be influential. Second, prior training and participation in group discussions about accepting and retaining clients may provide audit partners with a decision heuristic to employ, i.e., they may respond in a way they expect, based on prior experiences in similar situations, that their peer group of partners would decide such cases. If so, then individual risk differences may not be influential.

PROCEDURES

Participants

Client retention decisions are made at the highest levels of public accounting firms. In particular, the Engagement Partner, perhaps in consultation with other practice office partners, or the firm's National Office, considers the facts of the engagement situation and decides whether or not to continue serving the client (Huss and Jacobs 1991). Partners, therefore, constitute the type of participant enlisted to make the judgments necessary for this experiment.

Fifty-eight (58) audit partners from three international firms participated in the study. (59 instrument booklets were returned, but one was incomplete with regard to key variables so all results for this partner have been omitted.) Experimental materials were given to an audit partner contact in each participating firm, and that individual distributed the test instruments to subjects for them to complete on their own. Subjects and firms were guaranteed confidentiality of individual results. This confidence was protected by having the materials returned directly to the researchers without identifying marks.

Participating partners' demographics are shown in Table 1. Partners' average age was 45.3. They averaged 22.0 years of audit experience and 10.7 years in their current position. Ninety-seven (97) percent had responsibility for client retention decisions and had exercised such responsibility for 10.0 years on average.

TABLE 1: **Participating Audit Partners' Demographics (n=58)**

Variable	Mean	Std. Dev.	Minimum	Maximum
Years of Audit Experience	22	5.9	12.5	33
Years as Partner	10.7	6.1	1.5	27
Age	45.3	6.3	34	59

Materials and Experimental Design

Case materials were developed in consultation with three partners in an international accounting firm. The eight cases described selected aspects of a fictional Health Maintenance Organization's (HMOs) financial condition, the expected audit fees, and the public accounting firm's litigation exposure. An HMO scenario was selected to provide reasonable variation in the combination of financial data presented. Input from the partners suggested the nature of a service industry would provide a greater variety of financial combinations of business risk than those same variables would in a manufacturing environment.

Four client's and auditor's business risk factors (Johnstone 2000) were varied at two levels (high and low): Operating Cash Flow, Net Income before Taxes and Extraordinary Items, Audit

Fee, and Litigation Risk. Operating Cash Flow was either $280,250,000 or $9,106,315. Net Income before Taxes and Extraordinary Items was either $212,155,000 or $39,947,935. Audit Fee was either $124,000 or 310,000. Litigation risk was either reasonably possible or remote. The probability that the client will be retained was measured on a seven-point Likert-type scale, anchored by Very Unlikely (1) to Very Likely (7). Two orderings of the cases were developed to guard against possible order effects (primacy, recency, fatigue, etc.). An ANOVA including a dummy variable for order effects between the two versions indicated ordering was not significant ($p > 0.10$).

Following the eight client retention scenarios, partners were shown a litigation risk scenario, where probable litigation exposure was evaluated against a certainty equivalent (sure thing). Partners were asked to provide a monetary estimate of the level at which they would be indifferent between the gamble and the certainty equivalent.

This Variable Certainty Equivalent [VCE] approach is one of a general class of value or utility elicitation options known as indifference methods. In these methods, "the respondents match two stimuli or pairs of stimuli to meet a specified indifference relation" (von Winterfeldt and Edwards 1986, 217). The VCE elicitation method asks respondents to evaluate when they would be indifferent between receiving some certain amount (a sure thing), and receiving a lottery in which, for example, there is a 50% chance of winning $100 and 50% chance of winning nothing. For a broader discussion of decision analysis and approaches to preference elicitation, see Raiffa (1970), Edwards and Newman (1982), and Bunn (1984).

In the litigation risk gamble, partners were told there was a 50 percent probability of receiving an adverse jury verdict of a high dollar amount and a 50 percent probability of a jury verdict of zero from a pending law suit. Alternatively, partners could settle the suit and avoid the jury verdict. They provided a dollar amount at which they would be indifferent between settling and letting the jury decide the amount of damages.

The litigation settlement scenario employed to measure partner's individual risk preferences presented partners with a choice that involved the Certainty Effect (Allais 1953; Tversky and Kahneman 1981). The Certainty Effect reflects the reality that people would much rather eliminate risk than reduce it, even if the probability of a loss is reduced by the same amount in both cases. This result is predicted by Prospect Theory, but not by Expected Utility Theory, because in Prospect Theory small probabilities are over-weighted which inflates the importance of improbable events (Kahneman and Tversky 1979). Our litigation settlement presented partners with two probabilities: a 50 percent probability of an adverse jury award of $1,750,000 and a 50 percent probability of a jury award of $0 to the plaintiff (expected value of $875,000). We use the partners' responses to this gamble as our measure of individual risk preference in this study. (Responses to three different litigation risk gambles were elicited. Only the response to the one gamble involving the Certainty Effect is utilized in this study.)

The litigation scenario does not precisely fit the "real world," but it captures the risk assessment inherent in the gamble. Numerous additional factors would certainly be considered by

audit partners in deciding a question about litigation settlement in actual practice. However, the point of the gamble is not to be comprehensive and consider every contingency, but to measure individual risk preference using a method validated by prior research (i.e., von Winterfeldt and Edwards 1986).

Dependent Variable

To test H_A, responses to each of the eight client retention cases are summed to form a Client Retention Judgment Scale. This scaled dependent variable produces a multiple-item measure that should be more reliable than a single-item measure (Nunnally 1978). This approach is similar to the development of scales used to measure declarative and procedural domain knowledge (e.g., Bonner and Walker 1994) and general problem solving ability (e.g., Bonner and Lewis 1990), as well as IQ measures and numerous psychometric scales (Nunnally 1978). The response scale for the eight cases can potentially range from a low of 8 to a high of 56 (i.e., eight cases with a response scale of 1 to 7 for each case).

Cronbach's coefficient alpha was calculated to test the resulting scale's reliability. Cronbach's alpha for the Client Retention Judgment Scale is 0.88, indicating an acceptably high level of congruence among the scale items.

Independent Variable

The independent variable is the individual partner's risk preference. We classified each participating partner as risk neutral (0), risk averse (+1), or risk seeking (-1) based on responses to the certainty effect litigation settlement scenario. Partners were classified as Risk Seeking in the litigation settlement decision if their response to the Certainty Equivalent settlement offer was less than the theoretical indifference point, i.e., the expected value of $875,000. They were classified as Risk Averse if their response was greater than the expected value of $875,000. They were classified as Risk Neutral if their response was equal to the expected value.

The partners' mean response to the Certainty Equivalent litigation scenario, i.e., the dollar amount they would be willing to pay to settle and to avoid having the case go to the jury, was $460,000. Fifty-one partners were classified as Risk Seeking, five were classified as Risk Averse, and two were classified as Risk Neutral. Consistent with Prospect Theory, these results suggest audit partners may be risk *seeking* in situations framed as losses.

RESULTS

Influences of Audit Partners' Risk Preferences on Client Retention Decisions

We classified each partner as primarily risk seeking, risk averse, or risk neutral (coded +1, -1, and 0) as measured by their responses to the Certainty Equivalent litigation settlement risk gamble for the independent variable. Then we regressed the Client Retention Judgment Scale variable on each partner's risk preference.

As shown in Table 2, the regression results indicate Audit Partner Risk Preference is significant at $p < 0.10$ ($p = 0.07$, one-tailed test). The positive parameter sign indicates the risk seeking partners are more willing to retain the client across all eight risk scenarios and, conversely, the risk averse partners are less willing are to retain the client. Thus, H_A is supported.

TABLE 2: **Effects of Audit Partner Risk Preference on Client Retention Decisions: Regression Analysis Results for Risk Preference Classification**

Source	df	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	161.06	161.06	2.24	0.07
Error	57	4,095.52	71.85		
Corrected Total	58	4,256.58			
Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	40.24	2.1	19.19	<0.0001
Partner Risk Preference*	1	3.28	2.19	1.50	0.07

* Partners were classified as Risk Averse (coded -1) if their indifference point was greater than the expected value of settling in the final litigation gamble scenario ($875,000). They were classified as Risk Neutral (coded 0) if their indifference point was equal to the expected value. They were classified as Risk (coded +1) if their indifference point was less than the expected value.

Because it was surprising to us that such a large majority of audit partners demonstrated risk seeking behavior, we attempted to classify partners as risk seeking versus risk averse across both tasks. We classified partners as risk seeking or risk neutral for the litigation settlement scenarios as discussed above. For the eight client retention cases, we classified partners as risk seeking or risk averse depending on whether they were above or below the midpoint on the Client Retention Judgment scale. Results of this analysis, shown in Table 3, indicate 45 of the 58 partners, 78 percent of the participants in this study, were consistently risk seeking across both tasks. Another four partners were risk seeking in the client retention decisions but risk averse in the litigation settlement scenarios. Six partners were risk seeking in litigation settlement, but risk averse in client retention decisions. Only one partner was consistently risk averse in both litigation settlement and in client retention decision contexts.

TABLE 3: **Contingency Table of Consistency in Partners' Risk Seeking Decisions in Litigation Settlement and Client Retention**

Litigation	Client Retention Decisions	
Settlement Decisions	Risk Seeking	Risk Averse
Risk Seeking	45	6
Risk Averse	4	1

Partners were classified as Risk Seeking in the eight client retention cases if the sum of their responses was greater than the midpoint of the seven point scale, i.e., greater than 32. Partners were classified as Risk Seeking in the litigation settlement decision if their response to the Certainty Equivalent settlement offer was less than the theoretical indifference point, i.e., the expected value of $875,000.

It is not surprising that some partners would be risk seeking or risk averse in one these contexts but not the other. A partner could be willing to tolerate more risk by retaining a risky client when litigation is not yet imminent (risk seeking), in part, at least, because of denial. Denial of the probability of extremely negative outcomes has been demonstrated to affect decision making in other contexts (Rothbart 1970). Conversely, a partner could be more willing to engage in risk seeking in litigation settlement than in client retention because the former presents a stronger loss frame because the settlement payout represents a certain loss which, according to Prospect Theory, should have a stronger influence on risk preference.

The measure of individual partner risk preference we used can also be considered as a continuous measure of risk seekingness/risk aversion. To examine the efficacy of this measure, we regressed the partners' responses to the Client Retention Judgment Scale on the dollar amounts each partner provided as the amount they would be willing to settle in the Certainty Effect-Variable Certainty Equivalent litigation scenario. As shown in Table 4, partner Settlement Amount is not significant ($p = 0.20$) in explaining responses to the Client Retention Judgment Scale. The negative sign of the parameter coefficient indicates the more risk seeking a partner is, i.e., the smaller the dollar amount s/he would be willing to pay to settle the case (consequently, the more willing s/he is to let the case go to the jury), the higher the likelihood of retaining the risky client across all eight client retention scenarios. Thus, the direction is consistent with the results shown in Table 2 using the risk classification independent variable. The lack of significance for the continuous measure indicates that a partner's disposition toward risk seeking, risk aversion, or risk neutrality is a better predictor of their client retention assessments than the degree or the strength of their risk disposition.

TABLE 4: **Effects of Audit Partner Litigation Settlement Amount on Client Retention Decisions: Regression Analysis Results for Risk Preference as Continuous Measure**

Source	df	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	48.96	48.96	0.71	0.2
Error	57	3,881.13	69.31		
Corrected Total	58	3,930.09			
Variable	dF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	44.62	1.99	22.39	<0.0001
Partner Settlement Amount*	1	-3.05	3.63	-0.84	0.2

*Partners' responses in terms of the dollar amount at which they would be indifferent to settling litigation versus letting the case go to the jury where the expected value of the jury verdict was $875,000.

CONTRIBUTIONS AND LIMITATIONS

This study extends prior research in two ways. First, we provide a measure of audit partners' individual risk preferences when faced with prospective business losses (from litigation settlement). Second, we test whether differences in audit partners' individual risk preferences have a significant effect on their assessments of business risk, i.e., whether to retain a risky audit client. We find evidence that partners' individual risk preferences do influence their client retention assessments.

The circumstances in which audit partners are risk seeking, risk averse, or risk neutral and the influence of individual-level differences in audit partners' risk preferences are important to understand. Either too aggressive or too cautious an approach to risk can cause audit firm profitability to be adversely affected. Newly developed computerized models for assessing risks associated with client continuance/acceptance do not explicitly recognize and weight individual differences in risk (Bell et al. 2002). Even though outputs of such models may serve merely as inputs to group discussions, group discussions are not a panacea.

Group decision-making can produce greater divergence among individuals instead of convergence in attitudes (Moscovici and Zavalloni 1969) even among highly experienced Certified Professional Accountants (Carnes et al. 1996). Thus, disagreements about retaining an existing client due to differences in individual risk preferences among audit partners might not be easily resolved by consulting with Reviewing Partners or Partner committees.

Perhaps most importantly, to the extent individuals are unaware of the underlying differences in their assessments of risk, group decisions can easily focus on a surface level issue such as a client's growth prospects (Choi et al. 2004) when the underlying source of disagreement between two partners or groups of partners is the difference in the partners' own attitudes toward acceptable risk (Johnstone 2000). Such discussions may be unproductive and lead to poor choices since the real source of disagreement remains unidentified.

Pratt and Stice (1994) found that client financial condition, operationalized as high vs. low operating cash flow in our study, affects auditor's business risk. Johnstone (2000) found that auditors' business risk affects their client retention decisions. We extend the results of these prior studies by demonstrating that differences in audit partners' individual risk preferences significantly influence these decisions as well.

The results of this study are limited by convenience sample of audit partners who participated and the decision contexts employed. In addition, the auditing environment is undergoing rapid changes and may be less stable now, with the PCAOB just beginning to assert itself, than the environment has been in many years. Emerging changes such as mandatory audit partner and/or firm rotation should be examined to determine what effect they will have on client retention decisions. Future research should examine the effect of increased awareness of individual auditors' risk preferences on client retention and acceptance decisions. For example, it would be useful to compare retention and acceptance decisions that result from a decision model such as KRISK (Bell et al. 2002) that does not explicitly recognize and weight individual risk preferences with a similar model that explicitly incorporates differences in individual risk preferences to determine explicit recognition facilitates convergence in group decision making by audit partners.

Future research should also attempt to measure audit partners' risk preferences in different decision contexts to increase the stability and generalizeability of risk preference classifications. Farmer (1993) found 80 percent of audit Seniors and Managers were risk averse. However, Farmer did not assess auditors' risk preferences in situations framed as gains and/or as losses. More research is needed to better understand situations in which auditors exhibit caution and conservatism and situations in which they exhibit risk seeking.

ENDNOTES

The decision to retain an existing client includes some of these factors as well. Hackenbrack and Hogan (2005) report that client size, fees from management consulting, public status, tenure, and unexpected delays are significant in explaining client retention rates for a sample of 22

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