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ACADEMY OF ACCOUNTING AND FINANCIAL STUDIES JOURNAL

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LETTER FROM THE EDITORS

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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.

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AN ANALYSIS OF THE RELATIONSHIPS AMONG INFORMATION SCOPE, ORGANIZATIONAL PROACTIVENESS, AND FIRM PERFORMANCE

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ABSTRACT

The widespread use of information technology no longer automatically conveys a competitive advantage to the users of such technology. Instead, the emphasis should be placed on the creative use of the information obtained through the technology rather than on the technology itself. One way to accomplish is to align the information systems design with the strategy that the organization is pursuing. Scope is an important characteristic of the information obtained through information systems while proactiveness is an important element of strategy. Although the relationship between these variables has been addressed from a conceptual perspective, this relationship has not been subjected to rigorous empirical analysis. This research examines these relationships based on a sampling of chief executive officers. The results suggest that the coalignment of information scope and organizational proactiveness has a significant and positive impact on firm performance.

INTRODUCTION

According to Carr (2003), the use of information systems has become so widespread that an investment in information technology does not necessarily guarantee a competitive advantage any longer. The important issue is to concentrate on the creative use of the information obtained from a system rather than the technology used to create, transmit and present the information (Dearstyne, 2004).

The above argument supports the proposition that organizations are more effective when their structural mechanisms and strategies are aligned or congruent (Chandler, 1962). Information scope is an important element in the design of information systems (a structural mechanism) while proactiveness is an important element of strategy. While previous research has addressed these constructs from a conceptual perspective, the relationships between these two constructs, particularly their congruence, have not been rigorously analyzed in an empirical manner.

The purpose of this research is to examine the relationships among information scope, organizational proactiveness, and their associated impact on firm performance.

REVIEW OF THE LITERATURE

Information Scope

The scope of an information system is concerned with the characteristics of focus, quantification, and the time horizon of the information provided by the system (Chenhall and Morris, 1986). A traditional information system provides information which is focused on internal organizational events, stated in monetary terms, and based on historical data. In addition to the information provided by a traditional system, a broad scope information system provides managers with economic and noneconomic information concerning the external environment. A broad scope information system also provides measurements stated in non-monetary units as well as information which can be used in predicting the consequences of future events (Gordon and Miller, 1976).

Linn *et al* (2001) found that broad scope managerial accounting information does not moderate the impact of budget emphasis, budget participation and the perceived environmental uncertainty on the propensity to create budget slack. Sharma *et al* (2006) found that broad scope management information systems interact with individual managerial control mechanisms in both the decision facilitation and decision influencing roles of management.

Some of the previous research addresses information scope and organizational performance in a contingency framework, as does this study. Gul (1991) found that a sophisticated management accounting information system providing broad scope information had a positive effect on performance under high levels of uncertainty, but it had a negative effect on performance under low levels of uncertainty. Chong and Chong (1997) proposed that broad scope information is an important antecedent of organizational performance. Naranjo-Gil (2004) reported an indirect effect of sophisticated accounting information systems on performance acting through a Prospector strategy in a sample of Spanish hospitals. Ismail and King (2006) found that firms that aligned their information processing capacity with their perceived information requirements, including scope, exhibited higher levels of performance than those firms that did not.

Organizational Proactiveness

Proactiveness has long been identified as an important element in strategy research. Miles and Snow (1978), Porter (1980), and Venkatraman (1989) addressed its role in their respective typologies.

The success of the Prospector strategic type in the Miles and Snow framework (1978) is dependent on finding and exploiting new product and market opportunities before the competition discovers them. To accomplish this, the Prospector must conduct broad, continuous environmental scanning in order to quickly identify these opportunities. This requires the Prospector to invest in mechanisms which allow it to monitor a wide range of environmental conditions, trends, and events (Miles and Snow, 1978).

At the other end of the strategic continuum, the Defender is concerned with protecting its limited, narrow domain. It tends to ignore developments outside this domain. Generally, the outside environment is viewed as a conglomeration of a relatively few important factors whose behavior can be accurately predicted and are not expected to dramatically influence the internal operations of the firm. Firms pursuing this type of strategy require information with an internal focus in order to maximize the efficiency of their operations (Miles and Snow, 1978).

Porter's (1980) differentiation strategy also recognizes the importance of proactiveness. Organizations following this strategy attempt to create products/services superior in quality, efficiency, design innovations, or style before the competition. As does the Prospector, a firm following a differentiation strategy must constantly scan the environment in order to quickly identify changes in consumers' tastes and the actions of competitors (Porter, 1980).

Like the Defender, Porter's (1980) overall cost leadership strategy requires an inward focus. Emphasis is placed on the efficient production of the goods and services. Little attention is paid to the outside environment.

Venkatraman (1989) viewed the proactiveness dimension of strategy as being characterized by early participation in emerging industries, continually searching for market opportunities, and experimenting with potential actions in response to changing trends. This behavior is also indicated by the introduction of new products ahead of the competition. Conversely, proactive behavior is also evidenced by the timely elimination of operations which are in the mature or declining phases of their life cycles.

The relationship between proactiveness and performance remains a source of research interest. In a recent study, Coulthard (2007) found a positive correlation between firm performance and proactiveness.

Information Scope, Organizational Proactiveness, and Environmental Uncertainty

An examination of previous research suggests a relationship between environmental uncertainty and information systems design, including the characteristics of the information obtained from the system. Gordon and Narayanan (1984) found that the primary driver of decisions concerning the characteristics of information required from information systems was management's perception of environmental uncertainty. They suggest that managers operating in more uncertain environments feel a greater need for external, non-financial, and future-oriented information. Managers facing less uncertainty in the operating environment favor internally generated, financial information with a deterministic or historical perspective.

Gul and Chia (1994) reported that the availability of management accounting system information with broad scope characteristics was associated with higher managerial performance under conditions of high perceived environmental uncertainty. Under low environmental uncertainty, the availability of broad scope information was associated with lower performance. Chong and Chong (1997) found that perceived environmental uncertainty is an important antecedent of management information system design, including the scope of information provided.

Abernethy and Guthrie (1994) found that broad scope systems were more effective in firms concerned with continuous market development and innovation. Firms which were less innovative and more interested in protecting an existing, stable product or market were less effective when using broad scope systems. It can be argued that the firms involved in continuous product development/innovation perceive their environmental uncertainty as high and require broad scope information to be effective. Likewise, those firms which are less innovative consider their environments to be more benign and their information requirements successfully met through a traditional information system.

Previous research also reveals relationships between environmental uncertainty and strategic orientation. Several authors (Chandler, 1962; Simons, 1987 and Govindarajan, 1984) have suggested that firms pursuing a Prospector type of strategy perceive environmental uncertainty as high. Firms pursuing a

Defender type of strategy are associated with relatively low levels of environmental uncertainty (Miles and Snow, 1978; Miller, 1988).

Information Scope, Organizational Proactiveness, and Firm Performance

If management is pursuing a highly proactive strategy, it will be continuously scanning the marketplace for new opportunities. It will also be constantly seeking to determine the future actions of competitors in order to undertake preemptive measures. Gordon and Miller (1976) posited that to promote proactive decision-making, the effective information system must provide information on the activities of competitors and long range forecasts of product demand and costs. Broad scope information is needed to fulfill these requirements. Information lacking in breadth of scope will not meet management's requirements for pursuing the proactive strategy. However, if a less proactive strategy is being followed, management does not require such broad scope information. In fact, broad scope information will be detrimental to effective decision making. According to Day and Schoemaker (2005), companies operating in relatively stable environments requiring a less proactive strategy will waste resources reacting to signals coming from a broad scope information system. Managers operating in this environment will also be faced with information overload if a system providing broad scope is employed. Tushman and Nadler (1978) indicated that information overload is dysfunctional and an impediment to organizational performance.

RESEARCH HYPOTHESES

The research cited above provides a contingency framework within which to specify the characteristics of the information to be obtained through an organization's information system in order to have a positive impact on organizational performance. The basic tenet of this study is that the scope of the information provided by the information system must be congruent with the degree of proactiveness of the organization. Furthermore, it is proposed that the degree to which this congruence exists has a significant and positive effect on firm performance.

Congruence can be measured in a number of ways. Venkatraman (1990) identified three perspectives from which the concept of fit or congruence can be approached: (1) the interactionist perspective, (2) the profile deviation perspective, and (3) the covariation perspective.

The interactionist perspective has long been a popular technique for analyzing congruence. Schoonhaven (1981, 351) stated ". . . when contingency theorists assert that there is a relationship between two variables . . . which predicts a third variable . . . they are stating that an interaction exists between the first two variables."

The profile deviation perspective views congruence in terms of the adherence to an externally specified profile. The logic underlying this perspective is that an ideal profile can be defined in terms of the variables of interest and that the degree to which the organization adheres to this profile will be positively related to performance (Venkatraman, 1990).

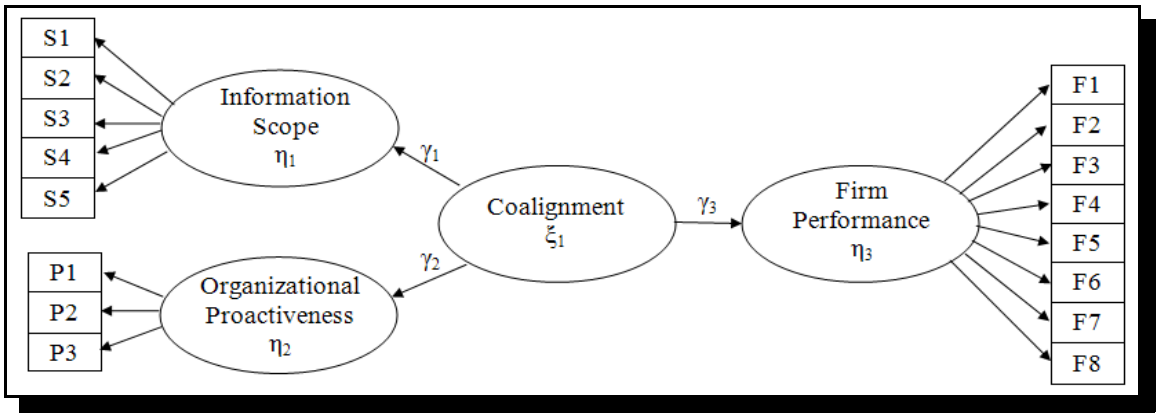
According to Venkatraman (1990), the concept of strategic fit under the covariation perspective is termed coalignment. He states ". . . specification of the coalignment in terms of covariation requires explication of the underlying linkages among dimensions" (Venkatraman, 1990, 24). This view of coalignment is the perspective of fit or congruence which is used in this study.

The assessment of coalignment was performed through the application of a second-order factor analysis as described by Venkatraman (1990). This is shown graphically in Figure 1. The assessment of the coalignment of information scope and organizational proactiveness positively affecting firm performance requires testing of two related hypotheses. Both hypotheses are stated in the alternative form below.

H_1: *Information scope and organizational proactiveness are positively and significantly related to the coalignment of information scope and organizational proactiveness. (Figure 1, y_1 and $y_2 > 0$).*

H_2: *The coalignment of information scope and organizational proactiveness is positively and significantly related to firm performance (Figure 1, $y_3 > 0$).*

Figure 1: Proposed Model



METHODOLOGY

Modeling Strategy

Structural equation modeling employing the LISREL statistical package was used for the data analysis. This analytical technique incorporates several features which correlation-based techniques do not. These are: (1) latent constructs, (2) estimation of errors in the measurement of variables, and (3) simultaneous estimation of multiple interdependent relationships.

A confirmatory modeling strategy as described by Hair *et al*. (2006) was employed in the study. First, measurement of the constructs and variables is addressed. Finally, the fit of the model and the relationships among the constructs are analyzed.

Measurement of the Constructs

All first-order constructs were measured using seven-point, Likert scales which have been used in previous research. Tables 1 through 3 show the scale items for each of the constructs. Table 4 provides the covariance matrix of the measured variables.

Table 1: Information Scope Variable Scale Items

To what extent is the information described provided to you through your firm's information system and is useful to you in decision making? If the described information is not provided to you through the information system, enter a number from the lower end of the scale.

S1. Information which relates to possible future events (if historical information is most suitable for your needs, enter a number from the lower end of the scale).
S2. Quantification of the likelihood of future events occurring (e.g., probability estimates).
S3. Noneconomic information, such as customer preferences, employee attitudes, labor relations, attitudes of government and consumer bodies, competitive threats, etc.
S4. Information on broad factors external to your organization, such as economic conditions, population growth, technological developments, etc.
Nonfinancial information which relates to the following areas:
S5. production or service information such as output rates, scrap levels, machine or employee efficiency, employee absenteeism, etc.
S6. market information such as market size, growth, share, etc.

(If you find that a financial interpretation of production/service and marketing information is most useful for your needs, enter a number from the lower end of the scale.)
Measured on a scale of 1 to 7 where
1 = Not useful
7 = Extremely useful

Table 2: Organizational Proactiveness Variable Scale Items

To what extent does your firm engage in the following activities or the statement describes the way your firm does business?

P1. Constantly seeking new opportunities related to the present operations.
P2. Usually the first ones to introduce new brands or products in the market.
P3. Constantly on the look out for businesses that can be acquired.
P4. Competitors generally preempt us by expanding capacity ahead of us.[R]
P5. Operations in the latter stages of the life cycle are strategically eliminated.

Measured on a scale of 1 to 7 where
1 = Not at all
7 = To an extreme extent
[R] Reverse scored

Table 3: Firm Performance Variable Scale Items

Evaluate your organization's performance in each of the following managerial activities.

F1.	Planning
F2.	Investigating
F3.	Coordinating
F4.	Evaluating
F5.	Supervising
F6.	Staffing
F7.	Negotiating
F8.	Representing

Measured on a scale of 1 to 7 where:
1 = Very low
7 = Very high

Table 4: Covariance Matrix of the Variables

	S1	S2	S3	S4	S5	P1	P2	P3	F1	F2	F3	F4	F5	F6	F7	F8
S1	3.43															
S2	2.30	3.36														
S3	1.29	1.69	3.92													
S4	1.67	2.17	2.76	3.79												
S5	1.41	1.71	2.32	2.48	3.96											
P1	0.26	0.29	0.52	0.82	0.47	1.85										
P2	0.56	0.45	0.78	0.60	0.88	0.92	3.40									
P3	0.51	0.43	0.33	0.76	0.42	0.93	0.64	3.66								
F1	0.12	0.41	0.38	0.49	0.46	0.65	0.68	0.21	2.40							
F2	0.24	0.24	0.22	0.53	0.25	0.77	0.41	0.49	1.07	1.86						
F3	0.12	0.07	0.06	0.26	-0.03	0.53	0.17	-0.12	1.13	1.01	1.74					
F4	0.04	0.15	0.16	0.35	0.18	0.64	0.27	0.13	1.16	1.04	1.09	1.73				
F5	-0.21	-0.16	0.04	-0.02	-0.04	0.41	0.21	0.06	0.77	0.50	0.79	0.85	1.27			
F6	-0.11	0.01	0.15	0.07	0.18	0.46	0.31	-0.08	0.96	0.66	0.81	0.90	1.07	1.70		
F7	0.30	0.20	0.20	0.41	0.12	0.74	0.34	0.24	0.93	0.88	0.83	1.07	0.62	0.89	1.97	
F8	0.27	0.21	0.31	0.43	0.15	0.70	0.55	0.24	0.92	0.83	1.11	0.92	0.64	0.78	1.15	1.91

Sx – Information Scope scale item
Px- Organizational Proactiveness scale item
Fx – Firm Performance scale item

Information scope was assessed using the scale, totaling six items, developed by Chenhall and Morris (1986) to measure the scope characteristic of information provided by management accounting systems. As

the management accounting system is an integral part of the management information system of any organization, this characterization was deemed representative of the information required of an organization's overall information system.

Organizational proactiveness was assessed through the scale, comprised of five items, developed by Venkatraman (1989) measuring the proactiveness dimension of the Strategic Orientation of Business Enterprise (STROBE) construct.

Organizational performance was measured using an eight-item scale developed by Mahoney, Jerdee, and Carroll (1963) which measures the respondents' assessments of their organizations' performance in accomplishing eight managerial tasks: planning, investigating, coordinating, evaluating, supervising, staffing, negotiation, and representing. Prior research has shown that managerial assessments of performance, as used in this study, are highly correlated with internally obtained objective performance indicators (Dess and Robinson, 1984) and objective performance indicators obtained from secondary data sources (Venkatraman and Ramanujam, 1986).

Coalignment was modeled as a second-order construct in the manner described by Venkatraman (1990) with two first order constructs, information scope and organizational proactiveness, as its indicators.

Sampling Frame and Data Collection Procedures

The *Disclosure* database was chosen as the sampling frame for this study. From this database, firms operating in only one industry were identified. This resulted in 1,948 firms being selected as the sample.

Firms operating in only one industry were selected due to problems in analyzing the strategic actions of firms operating in multiple market segments. Chandler (1962) and Rumelt (1974) stated that it is difficult to analyze the strategic responses of firms operating in multiple product-market segments, as a separate strategy may be followed in each industry in which a firm operates.

The research instrument, accompanied by a cover letter explaining the study, was sent to the chief executive officers of the 1,948 firms. Follow-up letters were mailed six weeks later. Anonymity of the respondents could not be guaranteed as it was deemed desirable to identify the industry represented by each of the respondents. Responses were received from 210 firms, resulting in a response rate of 10.8 percent. Of these 210 responses, 149 were usable for the study, resulting in an effective response rate of 7.7 percent. These 149 respondents represent eighty-nine different industries. This response rate was deemed acceptable considering the level of the individuals to whom the research instrument was sent and the fact that anonymity of the respondents was not guaranteed.

DATA ANALYSIS

Factor Analysis

A factor analysis specifying oblique rotation and maximum likelihood extraction was performed on each of the measurement scales. The factor analyses revealed a number of items in two of the constructs (information scope and strategic proactiveness) which loaded incorrectly, reflected cross-loadings (.40 or greater on more than one factor), or did not have a significant loading (.40 or greater) on any factor. According to Hair *et al.* (2006), two options are available at this point in the analysis: (1) interpret the

solution as it is, ignoring the problem items, or (2) delete the problem items. The latter alternative was selected for this study. This resulted in one item being deleted from the information scope scale and two items being deleted from the strategic proactiveness scale. The final factor solution for all three constructs is presented in Table 5.

Table 5: Factor Analysis

INFORMATION SCOPE	
Item	Loading
S1	0.89
S2	0.77
S3	0.73
S4	0.68
S5	0.58
Eigen	3.17
% Var	63.3
ORGANIZATIONAL PROACTIVENESS	
Item	Loading
P1	0.86
P2	0.43
P3	0.43
Eigen	1.62
% Var	53.9
FIRM PERFORMANCE	
Item	Loading
F1	0.81
F2	0.77
F3	0.7
F4	0.69
F5	0.68
F6	0.68
F7	0.68
F8	0.66
Eigen	4.84
% Var	53.7

Non-response Error

Chapman (1992) indicated that anytime less than a response rate of 100 percent is obtained, the potential exists for the sample to be non-representative of the population of interest. However, Hunt (1990) argued that no manuscript should be rejected on the basis of potential non-response error unless there is good reason to believe that the respondents differ from the non-respondents on the important issues being analyzed and that these differences would make the results of the study unreliable.

Armstrong and Overton (1977) and Churchill (1991) recommended addressing non-response error by assessing the responses of early and late respondents. This was accomplished in this study by segregating the data into quartiles based on the dates on which the completed survey instruments were received. The first quartile represents the earliest responses, while the fourth quartile reflects the responses received last. The fourth quartile serves as a proxy for non-respondents. Chapman (1992) finds this characterization of late respondents as surrogates for non-respondents to be valid. Univariate and multivariate analyses of variance tests were conducted comparing the first and fourth quartile responses for each of the variables. Table 6 shows the comparisons for all sixteen variables utilized in this study. No differences between the first and fourth quartile data were found for any variable, with the exception of the P2 measure of organizational proactiveness. The results of this analysis suggest that non-response error is not a major consideration.

Table 6: Assessment of Non-response Bias
Analysis of Quartiles

Variable	Quartile	Mean	Std Dev	F Value	p-value
S1	1 4	3.54 3.62	1.91	.02	.88
S2	1 4	3.00 3.50	1.93	.54	.46
S3	1 4	3.49 4.18	1.83	.00	.96
S4	1 4	3.43 3.65	1.98	.79	.38
S5	1 4	4.03 4.32	2.07	.17	.69
P1	1 4	5.46 5.47	1.26	1.24	.27
P2	1 4	3.95 4.06	1.65	6.09	.02
P3	1 4	4.05 4.32	1.98	.10	.75
F1	1 4	4.13 4.26	1.38	.70	.40
F2	1 4	3.46 3.56	1.66	.01	.90
F3	1 4	3.78 3.68	1.39	.32	.58

Table 6: Assessment of Non-response Bias Analysis of Quartiles					
F4	1 4	3.41 3.59	1.71	1.97	.16
F5	1 4	3.95 3.68	1.74	.78	.38
F6	1 4	4.41 5.03	1.47	.01	.92
F7	1 4	3.97 4.09	1.36	.22	.64
F8	1 4	4.68 4.56	1.26	.05	.82
Multivariate Tests					
			F Value	Exact	p-value
	Pillais		.28	.83	.78
	Hotellings		.32	.84	.77
	Wilks		.74	.84	.77
	Roys		.16		

Reliability

Cronbach's alpha was calculated to assess the reliability of each of the modified item scales. These reliability estimates are reflected in Table 7. All, except the organizational proactiveness scale, reflect a Cronbach's alpha above the threshold of 0.60 deemed desirable by Nunnally (1967). The Cronbach's alpha of 0.54 associated with the organizational proactiveness scale is slightly below the desired value. However, Novick and Lewis (1967) proved that, in general, Cronbach's alpha is a lower bound of reliability and provides a conservative estimate of a measure's true reliability. Therefore, all measurement scales were considered to reflect adequate reliability and acceptable for further analysis.

Table 7: Reliability Assessment of the Construct Measurement Scales	
Construct	Reliability (Cronbach's Alpha)
Information Scope	0.85
Organizational Proactiveness	0.54
Firm Performance	0.88

Estimation of Goodness of Fit of the Proposed Model

Table 8 shows the goodness of fit statistics associated with the proposed model. The p-value of .00 is less than the critical value of .05 and indicates poor fit as measured by the chi-square statistic. However, other research (Fornell and Larcker, 1981) has shown that the chi-square statistic presents limitations in its application to the evaluation of structural equation models. The GFI and AGFI measures of 0.86 and 0.81, respectively, are slightly below the acceptable value of 0.90 suggested by Bagozzi and Yi (1988). The total coefficient of determination (TCD) for the proposed model is 0.97, indicating a substantial amount of the variance of the structural equations is explained by the model. Finally, the RMSR of the model is 0.18. Bagozzi and Yi (1988) indicate that the RMSR value should be small.

Table 8: Goodness of Fit Statistics of the Proposed Model

Statistic	Value
X^2	209.7
p-value	0
GFI	0.86
AGFI	0.81
TCD	0.97
RMSR	0.18

GFI – Goodness of Fit Index
AGFI – Adjusted Goodness of Fit Index
TCD – Total Coefficient of Determination
RMSR – Root Mean Square Residual

Assessment of Internal Fit of the Proposed Model

Internal fit of the proposed model was assessed through examination of the significance of the standardized loading estimates, standardized residuals, and the modification indices. These measures are shown in Table 9.

Table 9: Loading Estimates of the Proposed Model[a]

Variable	Loading Estimate	t-value
S1	0.55	[B]
S2	0.66	6
S3	0.77	6.56
S4	0.9	6.97

Table 9: Loading Estimates of the Proposed Model[a]		
Variable	Loading Estimate	t-value
S5	0.71	6.28
P1	0.94	3.6
P2	0.4	3.47
P3	0.38	[B]
F1	0.68	[B]
F2	0.67	7.39
F3	0.77	8.39
F4	0.81	8.79
F5	0.68	7.54
F6	0.69	7.58
F7	0.68	7.55
F8	0.69	7.62
Largest Standardized Residual		6.84
Largest Modification Index		5.31

[A] All estimates are standardized
[B] Item is used for scaling and no t-value is provided
Sx – Information Scope scale item
Px – Organizational Proactiveness scale item
Fx – Firm Performance scale item

An examination of the standardized loading estimates along with the associated t-values revealed that all exceed the critical value of +/- 1.64 (Bagozzi and Yi, 1988). An analysis of the standardized residuals revealed four exceeding the critical value of +/- 2.58 specified by Bagozzi and Yi (1988), with the largest is 6.84. Examination of the pattern of residuals for each pair of variables revealed one being associated with the information scope construct and three with the firm performance construct.

Examination of the modification indices revealed three exceeding the critical value of 3.84 (Bagozzi and Yi, 1988) with the largest being 5.31. In summary, examination of the internal fit criteria indicated that modifications to the model were necessary.

Model Modification

Initial modification entailed deletion of the four variables (one associated with the information scope construct and three associated with the firm performance construct) associated with the offending residual pairs exceeding the critical value of +/- 2.58. No theoretical support for the changes suggested by the modification indices could be found. Bagozzi and Yi (1988) cautioned against making changes to the model suggested by modification indices when theoretical support is lacking.

The modified model is shown in Figure 2. The goodness of fit statistics for the modified model are shown in Table 10 and indicate that the overall goodness of fit was dramatically improved. All goodness of fit statistics far exceed the criteria suggested by Bagozzi and Yi (1988). This analysis of the goodness of fit measures provides strong support for the modified model.

Figure 2: Modified Model

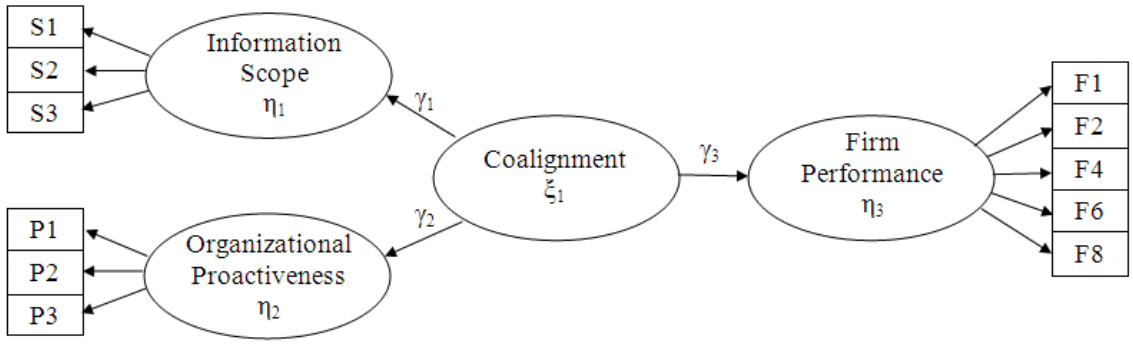


Table 10: Goodness of Fit Statistics of the Modified Model	
Statistic	Value
X^2	46.19
p-value	0.7
GFI	0.95
AGFI	0.92
TCD	0.86
RMSR	0.14
GFI – Goodness of Fit Index AGFI – Adjusted Goodness of Fit Index TCD – Total Coefficient of Determination RMSR – Root Mean Squared Residual	

An examination of the loading estimates, standardized residuals, and modification indices also provides support for the modified model. As shown in Table 11, the t-values associated with the loading estimates of the indicator variables on their constructs all exceed the critical value of +/- 1.64. Analysis of the standardized residuals and modification indices revealed that none exceed the critical values of +/- 2.58 and 3.84, respectively. In the absence of theoretical and/or methodological reasons for further modifications, the model was tentatively accepted.

Table 11: Loading Estimates of the Modified Model[a]		
Variable	Loading Estimate	t-value
S2	0.62	[B]
S3	0.78	7.61
S4	0.93	8.15
S5	0.71	7.11
P1	0.9	3.76
P2	0.42	[B]
P3	0.39	3.43
F1	0.71	7.55
F2	0.7	[B]
F4	0.8	8.33
F6	63	6.77
F8	0.64	6.92
Largest Standardized Residual		2.27
Largest Modification Index		3.52

[A] All estimates are standardized
[B] Item is used for scaling and no t-value is provided
Sx – Information Scope scale item
Px – Organizational Proactiveness scale item
Fx – Firm Performance scale item

Tests of Hypotheses

As indicated earlier, acceptance of the coalignment model requires the testing of two hypotheses, H_1 and H_2. Table 12 presents the path estimates and associated t-values for each of the hypothesized relationships.

The values reveal that significant positive relationships exist between information scope and coalignment, and between organizational proactiveness and coalignment. Therefore, H_1 is accepted (the null of H_1 is rejected). These values also indicate a positive and significant relationship between the coalignment of information scope with organizational proactiveness, and firm performance. Therefore, H_2 is accepted (the null of H_2 is rejected). Based on the goodness of fit criteria and the acceptance of hypotheses H_1 and H_2, the modified coalignment model shown in Figure 2 is accepted.

Table 12: Path Estimates of the Modified Model Relationships[a]		
Relationship	Parameter Estimate	t-value
Coalignment – Information Scope (H^i)	0.36	3.45
Coalignment - Organizational Proactiveness (H^1)	0.96	4.18
Coalignment – Firm Performance (H^2)	0.55	4.91
[A] All estimates are standardized		

DISCUSSION AND SUGGESTIONS FOR FUTURE RESEARCH

This study extends the research on the relationships between the elements of information systems design and organizational factors, such as strategy. The degree of coalignment, or fit, between information scope and organizational proactiveness was found to have a positive effect on firm performance. These results provide support for the proposition that organizational characteristics should be considered in the design of information systems.

The results of the study are subject to several limitations. First, for analytical reasons addressed earlier, the sampling frame was confined to publicly-traded firms limiting their operations to a single industry. The results presented may not be applicable to firms which are privately-held or operate as conglomerates.

Second, issues in the measurement of the variables were raised in this study. The factor analyses of the measures of information scope and organizational proactiveness required deletion of one and two variables, respectively, due to items which cross-loaded, loaded incorrectly, or failed to load on any factor.

Third, the source of the data for this study was chief executive officers. There is a possibility of key informant bias when information taken to represent the characteristics of an entire organization is obtained from a single respondent (Huber and Power, 1985). Gorry and Scott Morton (1971) noted that different types of information are required at different levels of decision-making within organizations. Chief executive officers can only be reasonably expected to be familiar with the characteristics of the information provided to them for decision-making. Information used in decision-making at lower levels within the organization may exhibit different characteristics.

Also, this study incorporates one element of information systems design, information scope, and one element of organizational orientation, proactiveness. Analyses incorporating other dimensions of information systems design and organizational orientation should also be conducted.

Finally, this research only examines the consequent effect of the coalignment of information scope and organizational proactiveness on firm performance. Future research should be conducted to identify the antecedent variables which affect these constructs.

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HISTORICAL INFLUENCES ON MODERN COST ACCOUNTING PRACTICES

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ABSTRACT

This paper reviews the significance of military cost accounting practices used during the U.S. Civil War. Many of our modern cost accounting practices were derived from those utilized by the U.S. Army from 1861 to 1865. Cost accounting practices were vitally important during this period in order to properly manage all expenses relating to "men and materials." Army accounting clerks and quartermasters were taught comprehensive accounting principles and practices at West Point. These practices were also used in military institutions such as the Springfield Armory. The majority of these military cost accounting principles are still in use today. Historical practices such as cost identification, cost classification, and budgeting (cost management) continue to provide modern business managers with the ability to effectively and efficiently control and manage expenditures.

INTRODUCTION

Modern business firms utilize a variety of cost accounting practices in an effort to manage expenditures and maximize profits. The origin of many of these can be traced to cost related principles taught by military institutions. This paper will first review the development of cost accounting prior to the Civil War. Cost accounting principles and practices developed rapidly during the early 1800s. Prior to that date, very little effort was made by business owners to classify and manage various costs. The bookkeeping principles introduced by Pacioli in 1494 were little changed until the turn of the nineteenth century.

The second portion of this paper contains the major theme of this paper. It is the importance of the cost accounting practices used by the U.S. Army during the Civil War. These practices were quite revolutionary for the period and allowed the army to accurately classify and manage expenditures. Instructors at West Point were some of the leaders in the analysis and management of expenditures. They developed an accounting system that identified and classified all costs related to "men and materials." Since the cost of the war was so enormous, the United States Government required adequate cost accounting from all military units of all expenditures for payroll, materials and supplies, food products, hired workers, and all other military costs. Without proper cost identification, classification, and management, the Union Army would not have succeeded in its war efforts. Seven cost related reports are included in the appendix and reviewed in this paper.

The final portion of this paper reviews the importance of Civil War era cost accounting practices on modern procedures. These early practices have continued to be beneficial today in the effort to identify,

classify, and manage costs. The cost accounting contributions of the military during the early to mid-eighteenth century have provided a theoretical basis for the accounting systems of today. Modern business firms continue to refine these principles in an effort to operate in a more efficient manner.

EARLY COST ACCOUNTING HISTORY

Prior to 1800, there was minimal interest in the process of identifying and managing costs. Accounting texts published in the United States in the late 1700s utilized the concepts of double entry bookkeeping that were originally published by Pacioli in his "Summa" text of 1494 (Previts & Merino, 20). Later, English textbooks by Oldcastle in 1543 and Peele in 1553 were, in effect, restatements of the principles introduced by Pacioli more that fifty years earlier.

English accounting texts of the late eighteenth century were distributed in Colonial America and served to educate many notable Americans including George Washington. Washington kept personal ledgers that contained cash accounts with debits on the left pages and credits on the right side pages (Cloyd, 88). In addition, Washington regularly utilized a text called "Bookkeeping Methodiz'd" written by Scotland's John Mair in 1736 in an effort to maintain control over various farming cash receipts and expense accounts. Washington operated a significant farming operation with revenues of about $400,000 from August 3, 1775 to September 1783 (Previts & Merino, 46).

According to John Palmer, Washington had significant cost identification problems and often used a "balancing entry" to balance a ledger for unaccounted funds (Palmer, 21). In an effort to balance his ledger on December 31, 1769, he entered a balancing entry for over 143,000 pounds to account for cash that was "lost, stolen, or paid away without charging." This clearly shows that costs were not managed properly during this period. Washington was unable to explain this huge shortage in cash other than to say that it was lost, stolen, or not recorded as an expense when the cash was paid.

Many authors believe that cost accounting, as we know it, did not come into existence until after 1800 (Previts & Merino, 56). Michael Chatfield feels that prior to 1885 neither accountants nor industrialists were interested in the identification and classification of organizational costs

(p.159). He feels that English and American cost accounting practices in 1870 were little different from Italian recordkeeping used some four hundred years earlier. There is modest information available on cost methodology during this period. A major reason for this is that cost identification and accumulation methods were considered industrial secrets. For that reason, little was published in an effort to minimize the likelihood that competitors would discover these practices.

Further, Fleischman and Parker believe that early cost techniques contained significant deficiencies including the lack of manufacturing costs that flowed through general ledger accounts, no integration of manufacturing costs with financial reporting, and the general lack of utilization of cost as a management control tool (p.24). It was not until the development of "scientific management" or "managerialism" that cost accounting principles as we know them today were created. Hoskin and Macve believe that the pioneers of managerialism were graduates of the U.S. Military Academy at West Point (1994, 5). Following the Civil War, these West Point educated officers joined both private and public sector organizations as managers. These men were perhaps some of the best educated men of the period, especially in the areas of engineering and managerial accounting, and they introduced these innovative principles in the firms they served.

In 1817, Colonel Sylvanus Thayer, often called the father of the Military Academy, was appointed Superintendent of West Point (http://www.usma.edu/history). Thayer instituted major changes in West Point operations by significantly upgrading academic standards, emphasizing military discipline, and stressing honorable and ethical conduct. Graduates of this period were largely responsible for the construction of a majority of the "nation's initial railway lines, bridges, harbors, and roads" (Ibid). Thayer reorganized West Point along "disciplinary" lines and required students to learn new scientific, mathematical, and engineering disciplines. He emphasized the line and staff organizational structure in his instructional process. Thayer also emphasized constant examinations and a numerical grading process.

Thayer's new "accountability" system included numerous required reports in addition to the numerically graded set of exams in an effort to raise the educational standards of the military academy (Hoskin & Macve, 1988, 45-46). This West Point "connection" was a breeding ground for knowledge and power experts who would go on to further develop a generalized accountability system – a system that ultimately impacted accounting practiced during the Civil War. Men schooled at West Point discovered a power to increase productivity and reduce costs and inserted that approach into a general disciplinary framework. (Hoskin & Macve, 1988, 38).

Graduates of West Point were often stationed at other military institutions such as the Springfield Armory. This entity was one of the most studied prototypes of a large factory, and it was considered to have one of the most sophisticated systems of accounting procedures and controls (Chandler, 1977). According to Hoskin and Macve, this was the result of accounting methods used by West Point trained managers after 1840 (1988, 1994). These managers were able to classify and manage costs and accomplish significant productivity gains at the armory.

Springfield Armory collected extensive product cost data in order to establish accurate target product prices. These price figures were compared to private contractor bids on government production jobs in an effort to reduce supplier overcharging (Fleischman & Tyson, 365). The War Department had to justify to the Congress the need for the armories, such as Springfield and Harpers Ferry. In order to accomplish this, it needed to demonstrate that the cost of providing arms at military armories was cheaper than obtaining them from private contractors. Under Regulations of the War Department, arms issued to soldiers had to be accounted for, and 'charged' to the responsible individual, if they were lost or damaged without good reason. A fixed price determined by unit cost of production figures was required to establish this unit cost figure (Hoskin and Macve, 1988, World Congress, 5). In the armory's copybook of Letters Sent in 1817, a 'List of prices of the component parts of the musket' was scheduled in detail (Hoskin and Macve, 1988, World Congress, 6). In addition, the armory also established unit labor costs for musket components in an effort to determine the total cost of a single musket.

In summary, many of the modern cost accounting practices originated from military education provided at West Point. Colonel Sylvanus Thayer, Supervisor from 1817 to 1833, was instrumental in the introduction of a new managerialism which allowed the United States to become the leader in the development of cost and management accounting principles (Hoskin and Macve, 1988, 37-38). His new managerialism not only emphasized discipline and ethical conduct but also increased the academic standards of the academy. In particular, Thayer's education emphasized cost identification, classification, and management. His efforts educated numerous officers who would later be employed in both the public and private sector and utilize these principles. The next portion of this paper reviews several cost accounting practices employed by the Union Army during the Civil War.

MILITARY COST ACCOUNTING PRACTICES

Cost accounting practices were utilized extensively by soldiers in two positions within the army. The job descriptions of company accounting clerks and regimental quartermasters included the identification and classification of numerous costs related to the "men and materials." These were the two major assets of the Union Army and required extensive recordkeeping. For example, the accounting for clothing costs alone was an enormous task. Each soldier, depending on his rank, was allowed a specific amount of clothing each year of his five- year enlistment. The cost accounting practices taught at West Point were incorporated into three instructional texts that are discussed in the following paragraphs.

Company accounting clerks and regimental quartermasters were required to prepare numerous reports on men and materials. A company included approximately one hundred men and a regiment normally included ten companies or about one thousand men. Therefore, the amount of cost identification, classification, and management was substantial. The clerks and quartermasters utilized three important reference texts in an effort to safeguard all assets and produce reports and statements that were both accurate and reliable.

These texts, published between 1861 and 1865, were utilized as instructional guides for proper accounting practice. The first book is the "Revised Regulations of the Army of the United States 1861". This document provided complete information on procedure and protocol, organizational structure, court-martials, and all reports required in order to maintain proper documentation of both human and physical resources (War Department, 1861). This text of nearly 600 pages provided detailed instructions concerning the reports that were required on a quarterly, monthly, weekly, and daily basis. It served as the chief instructional guide for required accounting practice and adequate reporting. In particular, the revised Army Regulations of 1861 provided accounting clerks and quartermasters with an effective and efficient system of cost accounting by clearly summarizing a variety of cost procedures.

The second important military cost accounting text was titled "The Company Clerk" (Kautz, 1865). In a circular issued to all company officers on June 28, 1863, this text was recommended for all officers in the volunteer service "to acquaint themselves with its very valuable and necessary information" (Ibid). The preface of this text states that "we have numerous textbooks that tell us what to do, but few, if any, tell us how to do it." This was the primary "how to" manual for the company accounting clerks. The book showed clerks how and when to make all returns, reports, rolls, and other papers, and what to do with them. In addition to cost accounting practices, this document also instructed clerks on proper internal control procedures.

The third instructional text of the period is "The Quartermaster's Guide" which was published in 1865. This included full instructions for preparing all reports and returns at the quartermaster's level (Case, 1865). Since the Quartermaster's department was responsible for all "men and materials," this text also included all related General Orders from May 1, 1861 to April 10, 1865. In particular, part two of this document (pp. 114-188) showed examples of all required forms (many were completed form examples). These three instructional texts provided clerks and quartermasters with the knowledge to accurately follow required cost accounting practices. The following paragraphs discuss several cost accounting practices employed during the Civil War.

The company accounting clerk position represented the most basic level of cost recordkeeping for the army (Kautz, Preface). The company accounting clerk was a position filled by a man who was either a non-commissioned officer or soldier who was known to have good penmanship and a capacity for keeping

good reports and records. This basically meant that privates (soldiers), corporals, or sergeants (non-commissioned officers) were allowed to hold the position of company clerk. The company clerk did not receive any extra pay for the job but was excused from most other duties. His major duty was to produce adequate records and reports for the approximately one hundred men in the unit.

The clerk prepared, on a daily basis, a number of journal books. The clerk was required to maintain current and accurate records in nine separate books. The Morning Report Book, Sick Book, Rosters, Descriptive Book, Clothing Book, Order Book, Account Book of Company Fund, Register of Articles Issued to Soldiers, and Record Book of Target Practice were all the responsibility of the company clerk (Kautz, 9). Some of these books contained a wealth of qualitative data such as the physical characteristics of each soldier and his length of enlistment. A majority of the texts, however, involved the recording of cost data involving either "men or materials." In addition, the clerks were given four general cost accounting practices which had to be followed in order to properly identify and accumulate costs.

The first general cost accounting principle stated that a clerk had to get invoices for all property that he receives (Kautz, 11). Since there were continuous transfers of materials and supplies among military units, these invoices provided an audit trail that allowed for the tracing of all costs. A second principle was the requirement that the clerk get a receipt for all the property that he transfers to other units. This again allows for the cost audit trail to be maintained. Following a battle, units with extra ammunition and materials were required to transfer items to units with depleted inventories. A third cost principle was the requirement that clerks get "certificates" for property lost or destroyed. These "certificates" were normally signed by an officer of the company who verified that certain property was lost or destroyed in a battle. A soldier would not receive replacement property if a property authorized certificate was not submitted to regimental officers.

A fourth cost principle instructed clerks to not mix various property on the same form or report. This was to ensure that property from the Ordnance department, Quartermaster's Department, and Clothing, Camp and Garrison Equipage department was not combined on a single report. Each of these departments maintained cost records on the property that it provided. In order to properly trace costs from a department like Ordnance, the only property recorded on one of its reports was property that it inventoried and later allocated to units in the field.

Clerks were required to do a significant amount of cost accounting. One of the nine required books or journals was the Company Clothing Book. This document was used to account for all clothing issued to soldiers. For example, a corporal in a cavalry unit was allocated a total of $55.38 in his first year of service (Kautz, 21). The clothing book maintained a record page for every soldier as to the amount of clothing withdrawn during the year. If this corporal withdrew less than $55.38 of clothing the first year, he would receive the difference as additional pay at year end. However, if the solder withdrew more that this amount during the first year, the additional amount would be deducted from his pay. In order to calculate this over or under withdrawn clothing amount, the army provided the clerks with a standard cost table that listed the soldier's price for each article of clothing (Kautz, 18-19). One of the documents in the appendix of this paper pertains to soldier's clothing.

Standard costs and budgets were utilized extensively by both clerks and quartermasters. For example, when officers were transferred, the army paid for baggage costs up to a specified limit with the officer paying for any excess pounds. In the field, general officers were allowed 125 pounds of baggage while a captain was limited to 80 pounds (Regulations, 163). Travel costs were also calculated using a standard cost of ten cents per mile for officers (Regulations, 165). In addition, the number of miles allowed for reimbursement was

based on the shortest mail route as found in the General Post-Office book. This process allowed the army to minimize travel costs which were paid using a very objectively determined methodology.

Standard costs were also employed in the calculation of forage and straw for each unit. For example, the forage ration per day for horses was fourteen pounds of hay and twelve pounds of oats, corn, or barley (Regulations, 166). Mules were allowed the same amount of hay per day but only nine pounds of grain. It appears that mules got more miles to the pound of grain than horses. Straw was allocated on a similar basis with twelve pounds of straw allowed for bedding for each man, servant, and company woman (Ibid). Horses were allowed one hundred pounds per month as bedding. Standard cost and quantity figures were very typical in the army's cost accounting system.

Standard quantity cost information was also utilized by the clerks and quartermasters when issuing stationery. Paper, for example, was allocated in units called quires. A quire is 25 sheets or one-twentieth of a ream (500 sheets). A commanding officer of a regiment with at least five companies was budgeted a specific allowance of stationery each quarter (Regulations, 167). These officers were allowed ten quires of writing paper, one quire of envelope paper, 40 quill pens, six ounces of sealing wax, and two pieces of office tape. In addition, each military unit office was allowed one inkstand, one rubber stamp, and as many lead-pencils as required up to a maximum of four per year. These very conservative allocations of materials aided the army in controlling costs. This is true today in many organizations where assets are viewed as scarce resources.

Standards were also set for the quarters of officers and the amount of wood allowed to heat the dwelling during the year. For example, a Colonel was allowed two rooms plus a kitchen for his barracks (Case, 19). These officers were also allocated one cord of wood per month for the period from May 1 to September 30. From October 1 to April 30, the standard allowance was four cords per month. This again shows that the army maintained an extensive system of asset management utilizing standard quantities for many types of military materials.

A major cost accounting matter involved the payment of wages to soldiers and officers. The Company Clerk text states that muster rolls are the most important papers that company accounting clerks prepare (Kautz, 39). These payroll reports were prepared on the last day of February, April, June, August, October, and December. Since wages was the most significant cost for the army, muster rolls received significant attention from accounting clerks and company officers who had to verify and approve them. The army's pay department produced a standard pay schedule that included monthly wages for each rank. For example, a major general earned a monthly wage of $220 compared to a private who earned $13 each month (Regulations, 348).

The muster rolls also included deductions for a variety of items. For example, higher officer ranks earned enough so that taxes were required to be withheld. Also, extra clothing requested by the soldiers over their standard allowance was withheld from the soldier's pay at its standard cost (as printed in the regulations). Additional withholdings were made for amounts owed to sutlers. Sutlers were merchants who traveled with the military units or were camped near each military post. Sutlers were not allowed to sell goods on credit terms to soldiers in excess of one-third of their monthly wage (Regulations, 37). These limitations added to the cost accounting work required of company accounting clerks and regimental quartermasters.

Army regulations contain many more examples of early cost accounting. For example, clerks and quartermasters completed a wide variety of budget reports. The army required each unit to budget all of its costs especially for extra-duty wages, civilians hired, supplies, armaments, food items, and any other monthly expenditure. In addition, regular inventory reports, as least on a monthly basis, were required in order to

accurately calculate the amount of various inventories on hand. This included all horses, mules, cannons, other smaller munitions, wagons, ambulances, and all forms of small equipment and tents.

The cost accounting system used during the Civil War by company clerks and regimental quartermasters was amazingly efficient and effective, given the early date in our country's development. The next section of this paper reviews seven documents that are included in the appendix of this paper. These cost accounting reports and statements provide ample evidence that the army's accounting system was very advanced as a result of practices taught at West Point and other military institutions. These cost identification, classification, and management principles allowed the army to safeguard its assets and properly manage its expenditures. These practices continue to be utilized today in modern cost accounting systems.

EXAMPLES OF CIVIL WAR COST REPORTING

The appendix contains seven examples of cost records maintained by the army during the Civil War. Each of these forms was prepared to allow the army to properly classify and accumulate costs and maintain an accurate audit trail. The audit trail allowed each cost related to men or materials to be traced to the specific military unit incurring the cost. This is similar today to tracing various costs to the department that incurred them. The following paragraphs discuss the cost accounting implications of each document in the appendix.

The first report in the appendix was issued from army headquarters in Washington as General Order, No.364 on November 12, 1863. This was reproduced in all of the reference manuals in order to provide clerks and quartermasters with information on the standard cost of each item of clothing. For example, a forage cap had a standard cost of 58 cents and one was allowed as part of the soldier's clothing allowance for each year of service. Flannel drawers had a standard cost of 90 cents and eleven were allowed in the five year clothing allowance (three the first year and two each following year). This important cost document allowed the army to maintain a record of the cost of all clothing withdrawn by each soldier. When the total amount of clothing withdrawn was compared to the clothing allowance for the year, any variance could be calculated. If withdrawn exceeded allowance, the soldier had a balance due to the army that was deducted from his pay (similar to taxes withheld today). If allowance exceeded withdrawn, the soldier had a receivable from the army for clothing not withdrawn which would be added to his pay. This was a critically important cost document for the calculation of clothing costs owed or due to each soldier.

The second document in the appendix is the yearly clothing allowance for soldiers in various units of the army. It appeared on page 21 of "The Company Clerk" and provided instructions to clerks regarding the amount of total clothing allowed per year (Kautz, 21). For example, a private in the artillery or infantry was allowed $194.85 of clothing over a five year enlistment period. This total allowance was based on the standard cost of the items of clothing as shown in the first document in the appendix and the standard quantity of annual clothing allowance. The standard quantity schedule found in the army regulations text clearly showed the number of hats, coats, trousers, shirts, socks, and undergarments allowed each year of enlistment (Regulations, 170). For example, thirteen pairs of trousers were allowed during the five year enlistment period with three pair the first, third, and fifth year and only two pair in the second and fourth years. Only one "great-coat" (heavy, winter) was allowed in the first year of the five year period. This explained the larger first year allowance (see document 2) that provided a private in the artillery with $52.03 of clothing in the first year but only $30.12 in the second year.

A review of this table reveals that yearly allowance average approximately 40 dollars per year. However, the first year allowance was the largest since the soldier received a complete set of clothing. As mentioned earlier, if the soldier withdrew more clothing than the allowance amount, the "excess" was charged to the man in the form of reduced pay on the next muster roll. Conversely, at the end of an enlistment year, any "under-withdrawn" clothing was added to the soldier's pay at the next muster roll. Cost accounting for clothing was a massive task for company clerks who had to record even the smallest clothing withdrawal in the company clothing book. The annual accounting for clothing resulted in either an "account payable owed by the soldier for excess clothing withdrawn or an account receivable owed to the soldier for any clothing under-withdrawn."

The third table in the appendix lists the amount of monthly wage and number of horses and servants allowed (Regulations, 348-9). This represents one-third of the payroll tables included in the regulations. The four pages not included list all lower ranks down to and including privates. The document in the appendix lists all top military ranks and those with positions that pay significantly higher premiums. For example, a paymaster earned $80 per month compared to a wage of only $13 for privates. Note that most of the ranks listed on document three in the appendix were allowed a number of horses and at least one servant. The paymaster was allowed four horses in wartime and two servants. The forage (grain and hay) for the horses and pay for the servants required additional cost calculations for the clerks and quartermasters.

The fourth document in the appendix is an actual Civil War report that shows the importance of budgeting by the army. In an effort to properly manage all allocated resources, the company clerks and regimental quartermasters prepared monthly budgets for the majority of their routine expenditures. This form was used to budget for fuel, forage, straw, stationery, hire of mechanics, laborers, and teamsters, pay of extra-duty men and wagon/forage masters, hire of clerks, guides, and escorts, and mileage paid to officers. This report was a budget for August 1862 for straw, hire of mechanics, blacksmiths, and carpenters, hire of teamsters (worked with horses), and the pay of extra-duty men. Note that the teamsters had not been paid for five months (since March). In wartime, it was common for soldiers to not receive pay for several months because the typical bimonthly muster roll could not be held due to extended combat periods. Budgeting continues to be a critical cost accounting process in firms today.

The fifth document relates to payment for special services performed by a soldier in addition to his normal duties. The army referred to this as extra-duty pay. This form shows that Colonel Milton S. Robinson was paid for court-martial service. With many soldiers violating regulations and even deserting, the army was forced to hold numerous court martials in order to discipline unruly solders. Colonel Robinson was paid $1.25 per day in extra-duty pay for 20 days that he served on the court-marital board. A colonel in the artillery or infantry earned $95 per month, so this additional $25 in a twenty day period was a significant pay increase. Notice that the army prepared a special form for recording this type of extra-duty (Report No. 18-Court Martial Service). Payroll accounting was significantly more difficult when special duty pay was added to the normal monthly salary of each soldier.

The sixth document in the appendix is a monthly quartermaster report that reports the sources and uses of cash for one month. Captain H.A. Hascall was the Assistant Quartermaster at Fort Wells in Port Royal, South Carolina. The right side of this report lists the quartermaster's beginning cash balance and all receipts of cash for the month of December 1861. Four small cash receipts and a major twenty thousand dollar check combined with a significant beginning balance of cash provided a total of $40,169.41 of cash to be accounted for. The left side of the report shows the uses of cash and the ending cash balance on hand.

Summarizing the purchases and expenditures made during the month and the ending balance of cash on hand provides a figure for total cash accounted for of the same $40,169.41. This process is similar to preparing a bank reconciliation and ensuring that the balances per bank and books are equal. This report also has similarities to a modern cash flow statement that shows the organization's sources and uses of cash. Note that cash was accounted for at the bottom of the statement. Approximately $2,600 of the ending cash balance ($34,900) was on hand in an iron safe in Hascall's office, while the other roughly $32,300 was on deposit with the assistant treasurer in New York City. Accounting for cash was a monumental task for the thousands of various military units in the field during the Civil War.

The seventh and final report in the appendix is an excellent example of a final statement prepared when a soldier exited the military. The left side of the page shows the certificate prepared that describes the soldier and the reason for his leaving the military. In this case, Private Richard Hawkins from Rhode Island was discharged from service in February, 1862 due to his battle wounds. He received his last pay on December 31, 1861. With his discharge on February 11, 1862, he was owed one month and eleven days of wage at the rate of $13 per month. His final statement shows total pay of $17.76 plus wages for a 21 day period ($9.10) to return to his home in Rhode Island. The army assumed that he could travel the 420 miles to his home at the rate of 20 miles per day in the calculation of this 21 day period.

In addition, he was paid fifty cents per day ($10.50) for subsistence meals while on his journey home. The final addition to his pay ($18.38) was for clothing allowed but not drawn. This gave him a total wage credit of $55.74 from which was subtracted the value of clothing withdrawn during the last year ($39.06). The clothing withdrawn figure would have been found in the clothing book of his company. The final accounting figure showed that the army owed Private Hawkins a net total of $16.68. This process continues today when an employee leaves a firm and the "final payroll" must be calculated. Any amounts owed to the employee for wages and other benefits must be compared with any advances given to the worker.

These seven documents provide the reader with a better understanding of the amount of cost accounting that was conducted by the army during the Civil War. Cost accounting practices such as budgeting and the use of standard quantities and costs were typical in the army's system of recordkeeping. Army officers, upon their discharge from the army, took these essential practices with them as they entered both private and public organizations as management personnel.

INFLUENCES ON MODERN COST ACCOUNTING PRACTICES

Many of the cost and managerial accounting principles included in modern textbooks originated with West Point and Springfield Armory educational training. As discussed earlier, military cost accounting during the Civil War was significantly advanced when compared to the typical American business of the period. Mowen & Hansen define managerial accounting as the "providing of accounting information for a company's internal users" (Mowen & Hansen, 4). The army's accounting system allow it to record, classify, and interpret cost information in an effort to make good decisions concerning the purchase and distribution of all arms and supplies.

The "Company Clerk" was written in order to allow the army to maintain a record of the men and property that was "correct and perfect" (Kautz, 11). This training manual provided sufficient details on "how" to correctly prepare each report. It was written due to the "total neglect, in most of the regiments, to render the prescribed returns" (Kautz, 3). Kautz believed that this problem resulted from the lack of a book that

described the detailed preparation of the required reports rather than the carelessness or neglect of duty on the part of the officers. This book summarized the majority of cost identification and control principles taught at West Point.

Other modern managerial accounting texts such as Crosson & Needles, Weygandt, Kimmel & Kieso, and Jiambalvo include a discussion of many of the cost accounting practices used by the army during the Civil War period. All four textbooks contain significant attention to the process of budgeting. Weygandt, Kimmel & Kieso in its 2008 edition includes two full chapters on budgetary planning and control. This process was at the heart of the army's accounting system during the war. Clerks and quartermasters budgeted payroll of the soldiers and hired men for their company or regiment. They also prepared budget requests for arms, munitions, food products, and supplies of all types. Differences between budgeted and actual costs were investigated by regimental officers and auditors in Washington. The concepts of favorable and unfavorable variances are also included in all current managerial accounting texts. The importance of utilizing a comprehensive budgeting system continues today.

All modern cost and managerial textbooks discuss the importance of internal reports in an effort to aid decision making of the owners and managers. Mowen & Hansen state that one of the three broad objectives of cost or managerial accounting is to provide information for internal decision making (Mowen & Hansen, 4). This was the philosophy of the army during the Civil War period as it desperately attempted to identify, manage, and allocate costs in an effort to maximize the effectiveness of those recourses. Battles could not be won by a company or regiment if they had any shortages of men or materials. Therefore, Washington required a complete set of invoices, receipts, and other source documents that provided an audit trail for the numerous reports on both men and materials.

Crosson & Needles emphasize the Institute of Management Accountants (IMA) definition of management or cost accounting that includes the words "to assure appropriate use of and accountability for its (the entity) resources" (Crosson & Needles, 4). All four accounting texts listed above emphasize the importance of maximizing the use of an organization's resources. The army's extensive cost accounting system required reports from company clerks and regimental quartermasters on a daily basis. These reports and statements allowed the officers of each company and regiment to maintain an internal control system. A major goal of this system was the safeguarding of all the army's assets. Without adequate cost reports, the army would have not been able to efficiently and effectively utilize each of its assets.

In summary, modern cost and management accounting texts include basic principles and practices that were introduced by graduates of West Point and other military institutions. Officers in the army had learned detailed cost identification, classification, and summary procedures in order to efficiently manage all expenditures. Modern businesses continue to be concerned with comprehensive budgeting and the use of standard costs. In addition, the calculation of favorable and unfavorable variances is critical to modern businesses in order to manage costs in an effort to improve profits. When accounting clerks and quartermasters prepared detailed budgets for the soldier's payroll and all types of materials and supplies, they were introducing a fundamental cost accounting practice. The same is true for the use of standard costs for monthly wages, clothing, arms and ammunition, food, and all other supplies. These practices allow modern business firms to manage costs and safeguard assets. Without the introduction of these important cost principles, American businesses would have operated much less efficiently.

CONCLUSION

This paper reviewed the cost accounting practices of the U.S. Army during the Civil War in an effort to emphasize its contribution to modern cost management. A number of authors including Previts and Merino and Hoskin and Macve concluded that cost accounting, as we know it, did not come into existence until after 1800. Cost accounting principles in use today can be traced back to graduates of the U.S. Military Academy at West Point. These graduates of West Point often went on to other military institutions such as the Springfield Armory. This new "managerialism" provided a huge advancement in cost accounting theory. It allowed the army to better control and manage all of its daily expenditures. This comprehensive cost accounting system allowed the army to accomplish two critical internal control goals. These include the safeguarding of all assets and the ability to operate efficiently and effectively. Without this knowledge, the war may have lasted substantially later than 1865.

As the West Point trained officers were discharged from army service following the war, many became employed in large business enterprises across the country. Commonly engaged in management positions, they continued to apply the same cost accounting principles and practices they had learned at the academy. These basic cost accounting practices provided for the development of modern cost identification, classification, and control. Comprehensive budgeting systems, the use of standard cost and quantity data, the calculation of cost variances, and similar expenditure related principles continue to be valuable to modern businesses. Business firms of the 21st century owe much to the pioneers of "managerialism" who taught these innovative cost management practices over 140 years ago.

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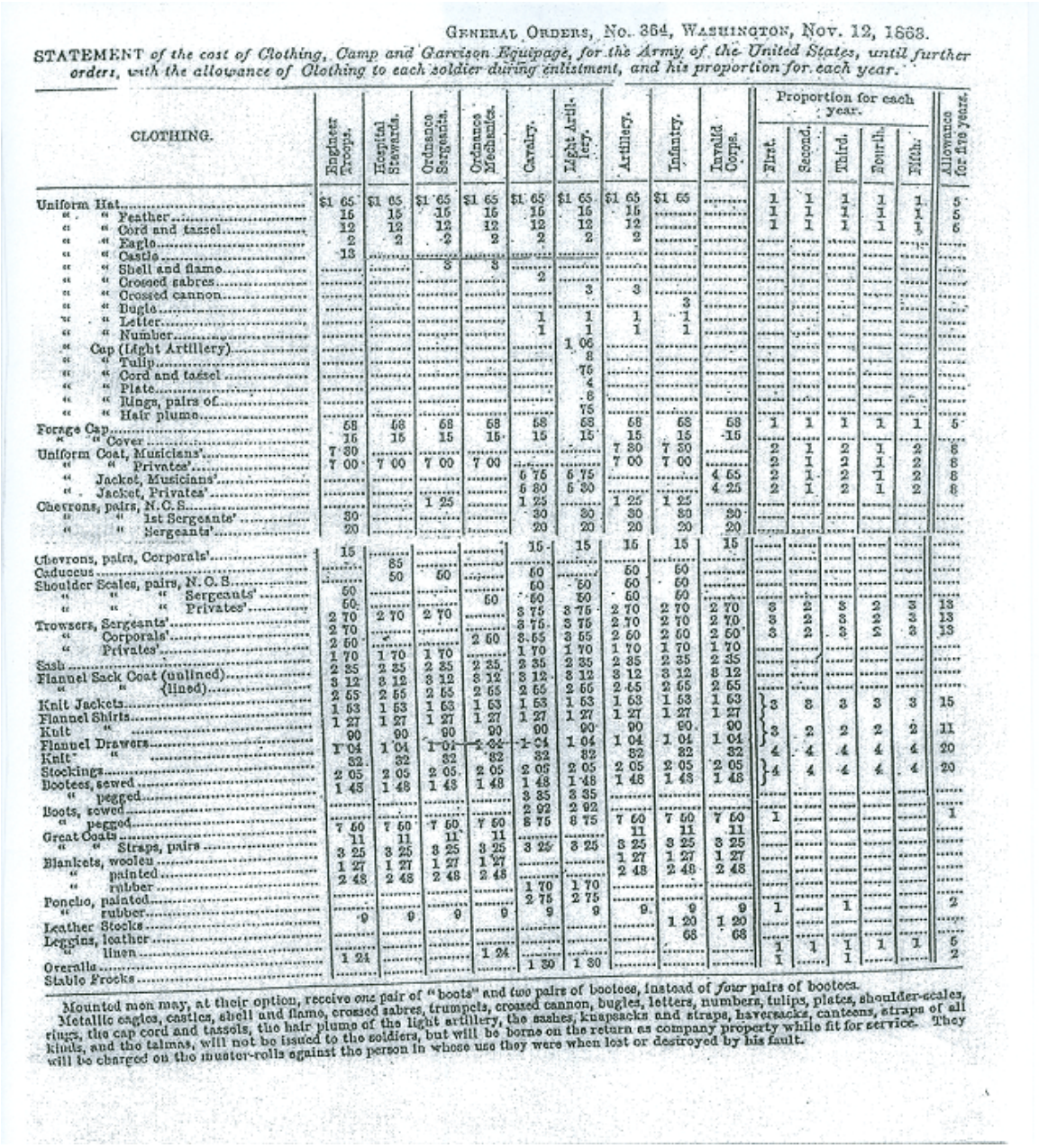
APPENDIX: DOCUMENT #1



GENERAL ORDERS, No. 364, WASHINGTON, NOV. 12, 1868.

STATEMENT *of the cost of Clothing, Camp and Garrison Equipage, for the Army of the United States, until further orders, with the allowance of Clothing to each soldier during enlistment, and his proportion for each year.*

CLOTHING.	Engineer Troops.	Hospital Stewards.	Ordnance Sergeants.	Ordnance Mechanics.	Cavalry.	Light Artillery.	Artillery.	Infantry.	Invalid Corps.	Proportion for each year. First.	Second.	Third.	Fourth.	Fifth.	Allowance for five years.
Uniform Hat	$1 65	$1 65	$1 65	$1 65	$1 65	$1 65	$1 65	$1 65	.....	1	1	1	1	1	5
" " Feather	15	15	15	15	15	15	15	.....	.....	1	1	1	1	1	5
" " Cord and tassel	12	12	12	12	12	12	12	.....	.....	1	1	1	1	1	5
" " Eagle	2	2	2	2	2	2	2	.....	.....	.....	.....	.....	.....	.....	.....
" " Castle	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Shell and flame	.....	.....	3	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Crossed sabres	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Crossed cannon	.....	.....	.....	.....	.....	3	3	.....	.....	.....	.....	.....	.....	.....	.....
" " Bugle	.....	.....	.....	.....	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....
" " Letter	.....	.....	.....	.....	1	1	1	1	.....	.....	.....	.....	.....	.....	.....
" " Number	.....	.....	.....	.....	1	1	1	1	.....	.....	.....	.....	.....	.....	.....
" Cap (Light Artillery)	.....	.....	.....	.....	.....	1 06	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Tulip	.....	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Cord and tassel	.....	.....	.....	.....	.....	76	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Plate	.....	.....	.....	.....	.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Rings, pairs of	.....	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " Hair plume	.....	.....	.....	.....	.....	75	.....	.....	.....	.....	.....	.....	.....	.....	.....
Forage Cap	68	68	68	68	68	68	68	68	68	1	1	1	1	1	5
" " Cover	15	15	15	15	15	15	15	15	15	.....	.....	.....	.....	.....	.....
Uniform Coat, Musicians'	7 30	.....	.....	.....	.....	.....	7 30	7 30	.....	2	1	2	1	2	8
" " Privates'	7 00	7 00	7 00	7 00	.....	.....	7 00	7 00	.....	2	1	2	1	2	8
" Jacket, Musicians'	.....	.....	.....	.....	6 75	6 75	.....	.....	4 65	2	1	2	1	2	8
" Jacket, Privates'	.....	.....	.....	.....	6 30	6 30	.....	.....	4 25	2	1	2	1	2	8
Chevrons, pairs, N. C. S.	.....	.....	1 25	.....	1 25	.....	1 25	1 25	.....	.....	.....	.....	.....	.....	.....
" " 1st Sergeants'	30	.....	.....	.....	30	30	30	30	30	.....	.....	.....	.....	.....	.....
" " Sergeants'	20	.....	.....	.....	20	20	20	20	20	.....	.....	.....	.....	.....	.....
Chevrons, pairs, Corporals'	15	.....	.....	.....	15	15	15	15	15	.....	.....	.....	.....	.....	.....
Caduceus	.....	85	.....	.....	60	.....	60	60	.....	.....	.....	.....	.....	.....	.....
Shoulder Scales, pairs, N. C. S.	.....	50	50	.....	60	60	60	60	.....	.....	.....	.....	.....	.....	.....
" " " Sergeants'	50	.....	.....	.....	60	60	60	60	.....	.....	.....	.....	.....	.....	.....
" " " Privates'	50	.....	.....	50	60	60	60	60	.....	.....	.....	.....	.....	.....	.....
Trowsers, Sergeants'	2 70	2 70	2 70	.....	3 75	3 75	2 70	2 70	2 70	3	2	3	2	3	13
" Corporals'	2 70	.....	.....	.....	3 75	3 75	2 70	2 70	2 70	3	2	3	2	3	13
" Privates'	2 60	.....	.....	2 60	3 55	3 55	2 60	2 60	2 60	3	2	3	2	3	13
Sash	1 70	1 70	1 70	.....	1 70	1 70	1 70	1 70	1 70	.....	.....	.....	.....	.....	.....
Flannel Sack Coat (unlined)	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	2 35	.....	.....	.....	.....	.....	.....
" " (lined)	3 12	3 12	3 12	3 12	3 12	3 12	3 12	3 12	3 12	.....	.....	.....	.....	.....	.....
Knit Jackets	2 55	2 55	2 55	2 55	2 55	2 55	2 55	2 55	2 55	.....	.....	.....	.....	.....	.....
Flannel Shirts	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53	3	3	3	3	3	15
Knit "	1 27	1 27	1 27	1 27	1 27	1 27	1 27	1 27	1 27	.....	.....	.....	.....	.....	.....
Flannel Drawers	90	90	90	90	90	90	90	90	90	3	2	2	2	2	11
Knit "	1 04	1 04	1 04	1 04	1 04	1 04	1 04	1 04	1 04	4	4	4	4	4	20
Stockings	32	32	32	32	32	32	32	32	32	.....	.....	.....	.....	.....	.....
Bootees, sewed	2 05	2 05	2 05	2 05	2 05	2 05	2 05	2 05	2 05	4	4	4	4	4	20
" pegged	1 48	1 48	1 48	1 48	1 48	1 48	1 48	1 48	1 48	.....	.....	.....	.....	.....	.....
Boots, sewed	.....	.....	.....	.....	3 35	3 35	.....	.....	.....	.....	.....	.....	.....	.....	.....
" pegged	.....	.....	.....	.....	2 92	2 92	.....	.....	.....	.....	.....	.....	.....	.....	.....
Great Coats	7 50	7 50	7 50	7 50	8 75	8 75	7 50	7 50	7 50	1	.....	.....	.....	.....	1
" " Straps, pairs	11	11	11	11	.....	.....	11	11	11	.....	.....	.....	.....	.....	.....
Blankets, woolen	3 25	3 25	3 25	3 25	3 25	3 25	3 25	3 25	3 25	.....	.....	.....	.....	.....	.....
" painted	1 27	1 27	1 27	1 27	.....	.....	1 27	1 27	1 27	.....	.....	.....	.....	.....	.....
" rubber	2 48	2 48	2 48	2 48	.....	.....	2 48	2 48	2 48	.....	.....	.....	.....	.....	.....
Poncho, painted	.....	.....	.....	.....	1 70	1 70	.....	.....	.....	.....	.....	.....	.....	.....	.....
" rubber	.....	.....	.....	.....	2 75	2 75	.....	.....	.....	.....	.....	.....	.....	.....	.....
Leather Stocks	9	9	9	9	9	9	9	9	9	1	.....	1	.....	.....	2
Leggins, leather	.....	.....	.....	.....	.....	.....	.....	1 20	1 20	.....	.....	.....	.....	.....	.....
" linen	.....	.....	.....	.....	.....	.....	.....	68	68	.....	.....	.....	.....	.....	.....
Overalls	1 24	.....	.....	1 24	.....	.....	.....	.....	.....	1	1	1	1	1	5
Stable Frocks	.....	.....	.....	.....	1 30	1 30	.....	.....	.....	1	.....	1	.....	.....	2

Mounted men may, at their option, receive one pair of "boots" and two pairs of bootees, instead of *four* pairs of bootees.

Metallic eagles, castles, shell and flame, crossed sabres, trumpets, crossed cannon, bugles, letters, numbers, tulips, plates, shoulder-scales, rings, the cap cord and tassels, the hair plume of the light artillery, the sashes, knapsacks and straps, haversacks, canteens, straps of all kinds, and the talmas, will not be issued to the soldiers, but will be borne on the return as company property while fit for service. They will be charged on the muster-rolls against the person in whose use they were when lost or destroyed by his fault.

APPENDIX: DOCUMENT #2

TABLE *specifying the money value of Clothing allowed to the Army of the United States.*

	NON-COM. STAFF.		CHIEF MUSICIANS.		FIRST SERGEANT.			SERGEANT.			
	Cavalry or Lt. Artillery.	Artillery or Infantry.	Cavalry or Lt. Artillery.	Artillery or Infantry.	Engineers.	Cavalry or Lt. Artillery.	Artillery or Infantry.	Engineers.	Ordnance.	Cavalry or Lt. Artillery.	Artillery or Infantry.
1st year...	$57 58	$55 13	$58 48	$55 73	$54 47	$55 68	$53 23	$54 27	$55 13	$55 48	$53 03
2d year....	32 17	31 77	32 62	32 07	32 06	31 22	30 82	31 96	31 77	31 12	30 72
3d year....	47 11	46 06	48 01	46 66	45 40	45 21	44 16	45 20	46 06	45 01	43 96
4th year...	32 17	31 77	32 62	32 07	32 06	31 22	30 82	31 96	31 77	31 12	30 72
5th year...	42 47	42 72	43 37	43 32	42 06	40 57	40 82	41 86	42 72	40 37	40 62
	211 50	207 45	215 10	209 85	206 05	203 90	199 85	205 25	207 45	203 10	199 05

	HOSPITAL STEWARD.	CORPORAL.			MUSICIANS.			ARTIFICER AND PRIVATE.			
		Engineers.	Cavalry or Lt. Artillery.	Artillery or Infantry.	Engineers.	Cavalry or Lt. Artillery.	Artillery or Infantry.	Engineers.	Ordnance.	Cavalry or Lt. Artillery.	Artillery or Infantry.
1st year...	$54 33	$54 17	$55 38	$52 93	$53 87	$55 38	$52 63	$53 27	$53 27	$54 48	$52 03
2d year....	31 37	31 91	31 07	30 67	31 66	30 97	30 42	31 36	31 36	30 52	30 12
3d year....	45 26	45 10	44 91	43 86	44 80	44 91	43 56	44 20	44 20	44 01	42 96
4th year...	31 37	31 91	31 07	30 67	31 66	30 97	30 42	31 36	31 36	30 52	30 12
5th year...	41 92	41 76	40 27	40 52	41 46	40 27	40 22	40 86	40 86	39 37	39 62
	204 25	204 85	202 70	148 65	203 45	202 50	197 25	201 05	201 05	198 90	194 85

The allowance to Volunteer troops is at the rate of $42 per annum.

APPENDIX: DOCUMENT #3

TABLE OF PAY, SUBSISTENCE, FORAGE, &c. OF THE U. S. ARMY.

GRADE.	Pay.	Subsistence.	Forage.		Servants allowed.
	Per month.	No. of rations per day.	No. of horses allowed in time of war.	No. of horses allowed in time of peace.	No. of servants allowed.
	Pay Department.				Pay Department.
Lieutenant-General	$270 00	40	$50 a mo. for forage.		4
Major General	220 00	15	7	3	4
Senior Aide-de-Camp to General-in-Chief	80 00	4	4	3	2
Aide de-Camp, in addition to pay, &c., of Lieutenant	24 00	.....	2	1	
Brigadier-General	124 00	12	5	3	3
Aide-de-Camp to Brigadier, in addition to pay, &c., of Lieutenant*	20 00	.....	2	1	
Adjutant-General	124 00	12	5	3	3
Assistant Adjutant-General, with the rank of Colonel	110 00	6	5	3	2
Assistant Adjutant-General, with the rank of Lieutenant-Colonel	95 00	5	4	3	2
Assistant Adjutant-General, with the rank of Major	80 00	4	4	3	2
Assistant Adjutant-General, with the rank of Captain	70 00	4	3	1	1
Judge Advocate	80 00	4	4	3	2
Inspector-General	110 00	6	5	3	2
Assistant Inspector-General, with the rank of Major	80 00	4	4	3	2
Signal Officer, with the rank of Major	80 00	4	4	3	2
Quartermaster-General	124 00	12	5	3	3
Assistant Quartermaster-General	110 00	6	5	3	2
Deputy Quartermaster-General	95 00	5	4	3	2
Quartermaster	80 00	4	4	3	2
Assistant Quartermaster	70 00	4	3	1	1
Paymaster-General, $2740 per annum.					
Deputy Paymaster-General	95 00	5	4	3	2
Paymaster	80 00	4	4	3	2
Commissary-General of Subsistence	110 00	6	5	3	2
Assistant Commissary-General of Subsistence	95 00	5	4	3	2
Commissary of Subsistence, with the rank of Major	80 00	4	4	3	2
Commissary of Subsistence, with the rank of Captain	70 00	4	3	1	1
Assistant Commissary of Subsistence, in addition to pay, &c., of Lieutenant*	20 00	.....	.....	.....	...
Surgeon-General, $2740 per annum.					
Surgeon of ten years' service in that grade	80 00	8	4	3	2
Surgeon, less than ten years' service	80 00	4	4	3	2
Assistant Surgeon of ten years' service	70 00	8	3	1	1
Assistant Surgeon of five years' service	70 00	4	3	1	1
Assistant Surgeon, less than five years' service	53 33⅓	4	2	1	1
MILITARY ACADEMY.					
Superintendent, not less than the Professor of Natural and Experimental Philosophy. The Commander of Corps of Cadets, not less than the Professor of Mathematics.					
Professor of Natural and Experimental Philosophy, $2240 per annum.					
Assistant Professor of Natural and Experimental Philosophy	70 00	4	3	1	1
Professor of Mathematics, $2240 per annum.					
Assistant Professor of Mathematics	70 00	4	3	1	1
Professor of Engineering, $2240 per annum.					
Assistant Professor of Engineering, and Instructor of Practical Engineering, each	70 00	4	3	1	1
Professor of Chemistry, Mineralogy, and Geology, $2240 per annum.					
Assistant Professor of Chemistry, Mineralogy, and Geology, and Assistant Professor of Ethics, each	70 00	4	3	1	1
Chaplain and Professor of Ethics, $2240 per annum.					
Professor of French, and Professor of Drawing, each $2240 per annum.					
Assistant Professor of French, and Assistant Professor of Drawing, each	70 00	4	3	1	1
Professor of Spanish, $2240 per annum.					
Instructor of Cavalry and Artillery Tactics	70 00	4	3	1	1
Adjutant of the Military Academy	63 33⅓	4	2	2	1
Master of the Sword, $1500 per annum.					
Teacher of Music	60 00	.....	.....	.....	...
Cadet	30 00	.....	.....	.....	...

APPENDIX: DOCUMENT #4

No. 9.

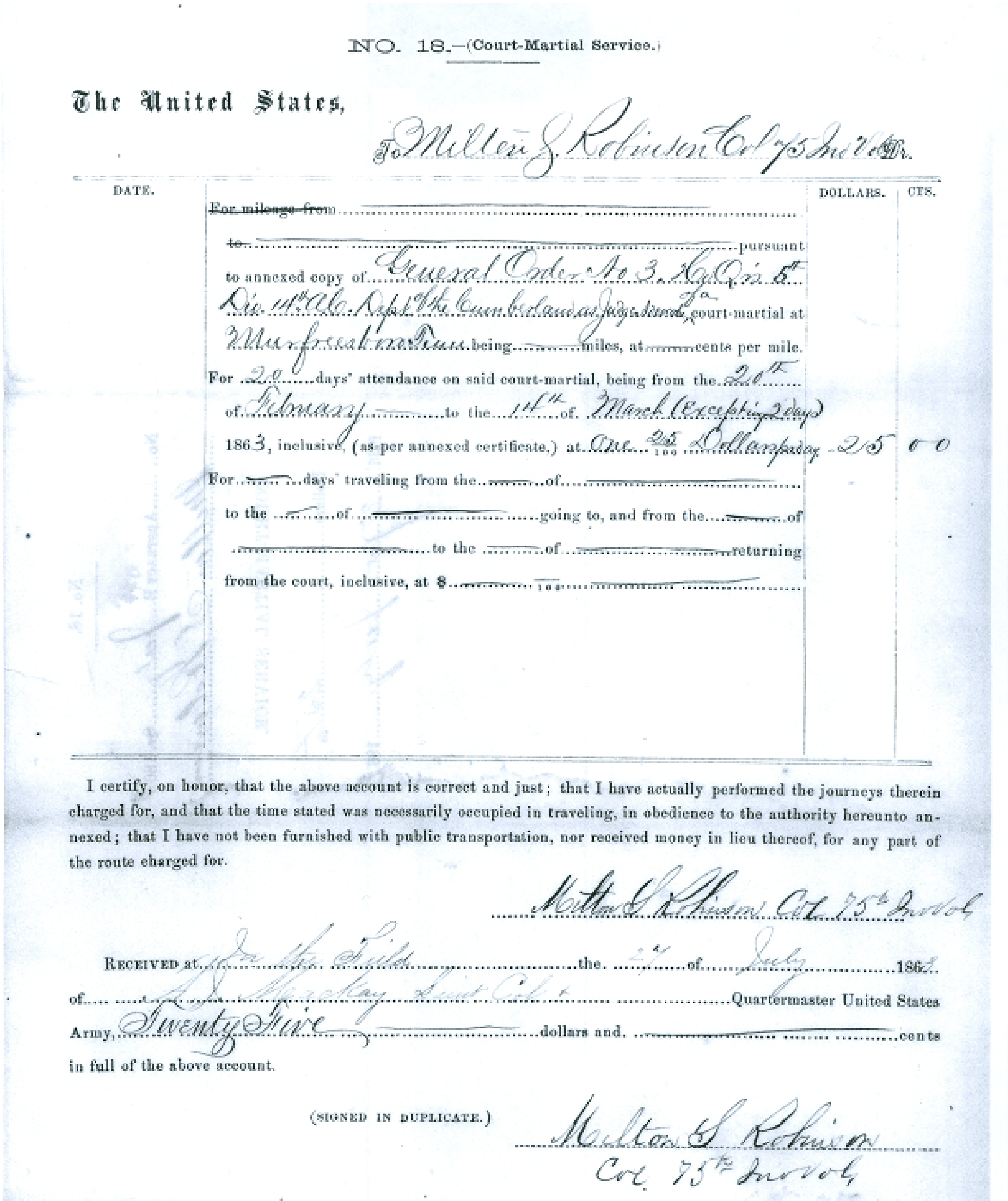
Estimate of Funds required for the service of the Quartermaster's Department in the Field in Tenn. by 1st Lt. W. P. McCleery[?] 18th Inf. 3d Batt. A.Q.M. for the month of Aug. 1862.

		DOLLARS,	CTS.
1	For Fuel		
2	Forage	275	—
3	Straw		
4	Stationery		
5	*Materials for building		
6	*Hire of mechanics, Blacksmith & Carpenter	100	—
7	*Hire of laborers		
8	*Hire of teamsters, 2d Batt. 18th U.S. Inf. (pay due since Mch 1862)	425	—
9	*Pay of extra-duty men, 3d Batt. 18th U.S. Inf. [illegible]	400	—
10	Pay of wagon and forage masters		
11	Hire of clerks, guides, escorts, expenses of courts-martial, of burials, of apprehending deserters, and other incidental expenses		
12	Hire or commutation of officers' quarters		
13	Hire of quarters for troops, or ground for encampment or use of military stations		
14	Hire of store-houses, offices, &c.		
15	Mileage to officers		
16	Outstanding debts		
17			
18			
19			
		1200	—
	Deduct actual or probable balance on hand	—	—
		$1200	—

* State for what service or purpose.

W. P. McCleery[?] 1st Lt. 18 Inf.

APPENDIX: DOCUMENT #5



NO. 18.—(Court-Martial Service.)

The United States,

To Milton S. Robinson Col 75 Ind Vol Dr.

DATE.		DOLLARS.	CTS.
	~~For mileage from~~ ... ~~to~~ ... pursuant to annexed copy of General Order No 3 H.Q. 5th Div 14th A.C. Dept of the Cumberland as Judge Advo court-martial at Murfreesboro Tenn being ... miles, at ... cents per mile.		
	For 20 days' attendance on said court-martial, being from the 20th of February to the 14th of March (Excepting 2 days) 1863, inclusive, (as per annexed certificate.) at One 25/100 Dollars per day	25	00
	For ... days' traveling from the ... of ... to the ... of ... going to, and from the ... of ... to the ... of ... returning from the court, inclusive, at $ ... 100 ...		

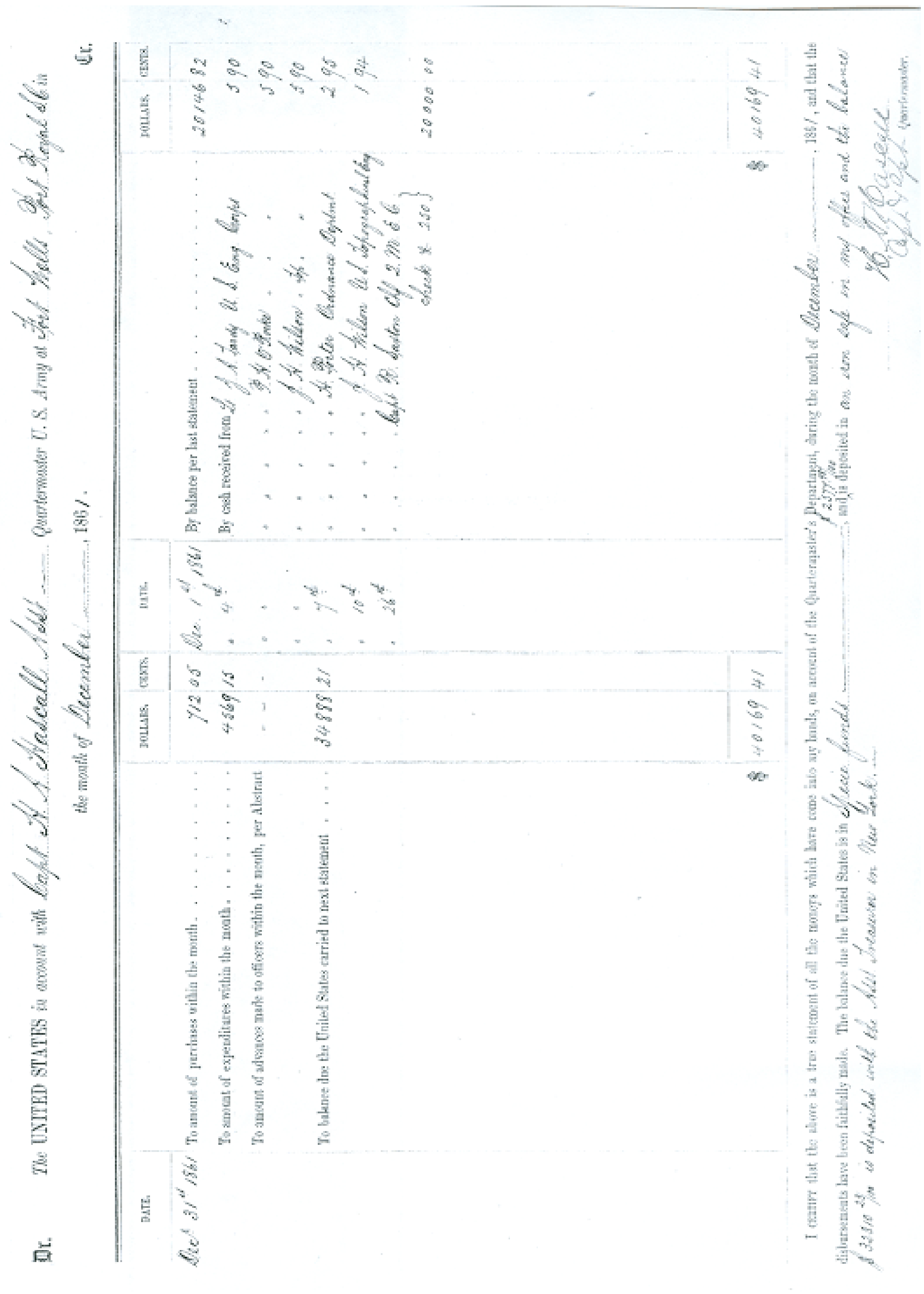
I certify, on honor, that the above account is correct and just; that I have actually performed the journeys therein charged for, and that the time stated was necessarily occupied in traveling, in obedience to the authority hereunto annexed; that I have not been furnished with public transportation, nor received money in lieu thereof, for any part of the route charged for.

Milton S. Robinson Col 75th Ind Vol

RECEIVED at In the Field the 24 of July 1863, of A. J. Mackay Lieut Col ... Quartermaster United States Army, Twenty Five dollars and ... cents in full of the above account.

(SIGNED IN DUPLICATE.) Milton S. Robinson Col 75th Ind Vol

APPENDIX: DOCUMENT #6



No. 1.

MONTHLY SUMMARY STATEMENT.

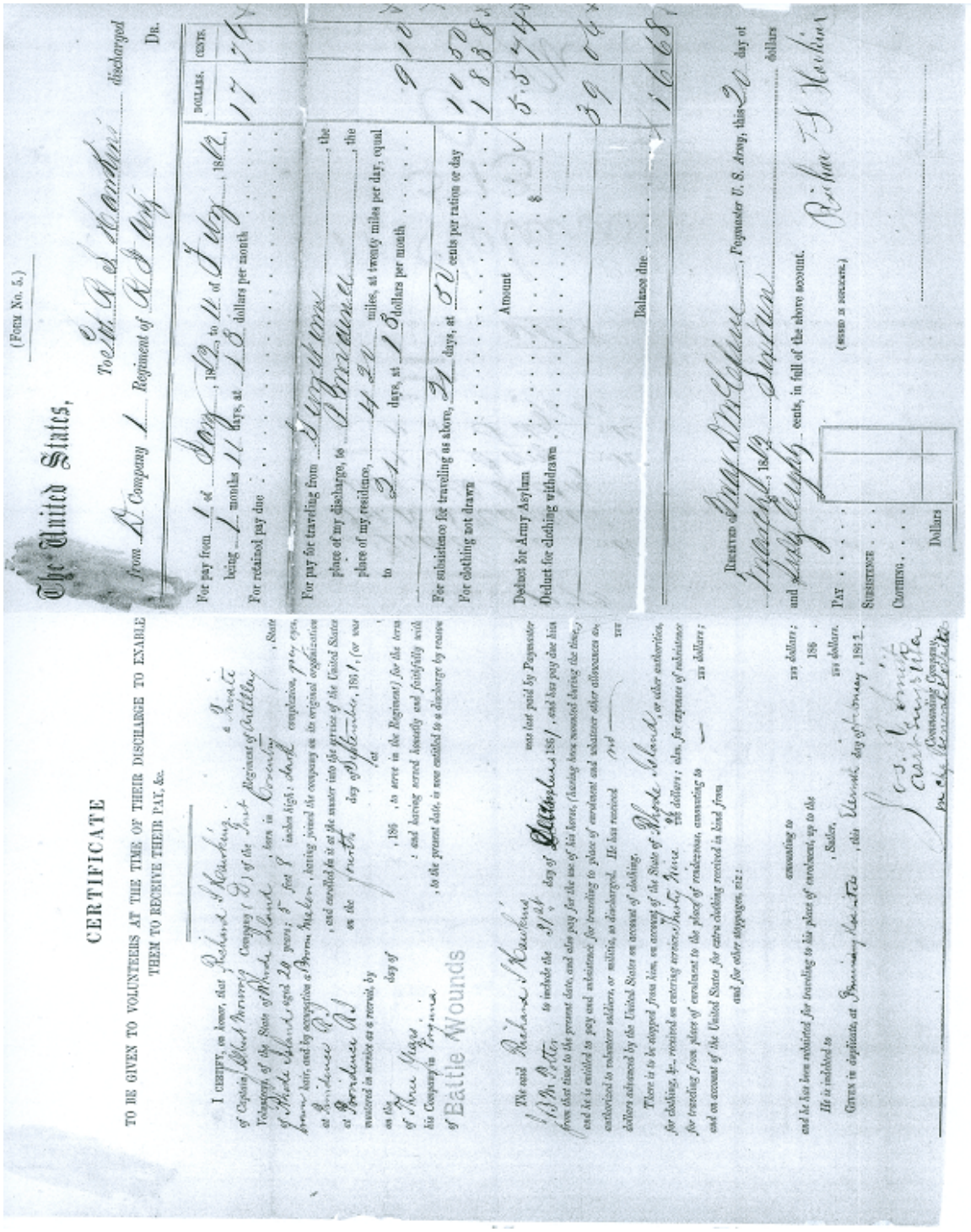
Dr. The UNITED STATES in account with Capt. H. L. Hascall Asst. Quartermaster U. S. Army at Fort Wells, Port Royal S.C. in the month of December, 1861. Cr.

DATE.		DOLLARS.	CENTS.	DATE.		DOLLARS.	CENTS.
Dec. 31st 1861	To amount of purchases within the month	712	05	Dec. 1st 1861	By balance per last statement	20146	82
	To amount of expenditures within the month	4569	15	" 4th	By cash received from Lt. J. A. Tardy U.S. Eng Corps	5	90
	To amount of advances made to officers within the month, per Abstract	–	–	" "	" P. H. O'Rorke "	5	90
				" "	" J. H. Wilson . Jr. "	5	90
	To balance due the United States carried to next statement	34888	21	" 7th	" H. Porter Ordnance Depmt	2	95
				" 10th	" J. H. Wilson U.S. Topographical Eng	1	94
				" 26th	" Capt. R. Saxton Chf. Q.M. E.C. check # 250	20000	00
	$	40169	41		$	40169	41

I certify that the above is a true statement of all the moneys which have come into my hands, on account of the Quartermaster's Department, during the month of December, 1861, and that the disbursements have been faithfully made. The balance due the United States is in Specie funds $2577 98/100 and is deposited in an iron safe in my office and the balance $32310 23/100 is deposited with the Asst. Treasurer in New York.

H. L. Hascall
Capt. & A.Q.M.
Quartermaster.

APPENDIX: DOCUMENT #7



THE NATURE, IMPACT AND FACILITATION OF EXTERNAL AUDITOR RELIANCE ON INTERNAL AUDITING

Arnold Schneider, Georgia Institute of Technology

ABSTRACT

This article discusses various issues dealing with ways in which external auditors rely on internal audit work, the impact of such reliance on external audit fees, and facilitating reliance on internal auditing. The article synthesizes and integrates professional auditing standards, surveys from practice-oriented literature, and findings from academic research studies. Issues are analyzed by providing recommendations, including examples that serve as recommendations, for guidance to both internal and external auditors.

INTRODUCTION

The growth of internal auditing over the years has led to much consideration for relying on internal audit work by external auditors. This paper discusses issues relating to ways in which external auditors rely on internal audit work, the impact of such reliance on external audit fees, and facilitating reliance. The contributions of this paper are that it synthesizes and integrates three diverse literatures -- professional audit standards, surveys from practice-oriented sources, and findings from academic research studies -- and analyzes the issues by providing recommendations, including examples that serve as recommendations, for guidance to internal and external auditors.

As background, the first section of the paper provides an overview of how internal auditing has developed in recent decades. The second section discusses three ways in which external auditors typically rely on the internal audit function. In the third section, the corroboration of internal audit work is addressed The fourth section discusses how internal audit work affects external audit fees, the fifth section deals with coordination of internal and external audit work, and the sixth section contains comments about communication issues. The final section summarizes and offers concluding remarks.

GROWTH OF INTERNAL AUDITING

Events since the mid-1970s have contributed to the growth of internal auditing. The Foreign Corrupt Practices Act of 1977 mandated public companies to establish and maintain effective internal accounting controls to provide reasonable assurance that assets are safeguarded and that transactions are properly authorized and recorded. To accomplish this, many companies established internal audit functions, increased internal audit staffing, and strengthened internal audit independence. Beasley et al. (2000) show that these investments in internal auditing have been effective, as companies with internal audit staffs are less prone to financial fraud than companies without internal auditing. Also, Coram et al. (2008) find that organizations

with internal audit staffs are more likely than those without internal auditing to detect and self-report occurrences of fraud.

In 1987, a report by the Treadway Commission recommended that public companies establish an internal audit function to be fully supported by top management and have effective reporting relationships. This means that "the internal auditors' qualifications, staff, status within the company, reporting lines, and relationship with the audit committee of the board of directors must be adequate to ensure the internal audit function's effectiveness and objectivity (Treadway Commission, 1987, p. 11)." The report urged that the internal audit function be "staffed with an adequate number of qualified personnel appropriate to the size and the nature of the company (Treadway Commission, 1987, p. 37)."

The New York Stock Exchange enacted a requirement in 2003 that all listed companies must have an internal audit function, either in-house or outsourced. This requirement was approved by the Securities and Exchange Commission (SEC) later in that year.

The Sarbanes-Oxley Act of 2002 has also contributed to the growth of internal auditing. "Internal auditors have enjoyed increased prominence, higher salaries, and a greater public appreciation for the role that internal auditing can play in a well-governed organization (Hermanson, 2006)." In particular, companies are using internal auditors to strengthen and evaluate their internal control systems to comply with the internal controls provisions of Sarbanes-Oxley. A 2003 survey by The Institute of Internal Auditors indicated that 20% of companies included in the *Fortune* 1,000 did not yet have internal audit departments but 50% of the *Fortune* 1,000 companies planned to increase their internal audit staffs to comply with Sarbanes-Oxley (Harrington, 2004). A later survey of 117 chief audit executives of public companies subject to the provisions of Sarbanes-Oxley indicated that 111 reported their companies increased internal audit budgets from 2002 to 2005 (Kaplan & Schultz, 2006). Of these 111, 32% increased internal audit budgets by more than 50%. Another survey of 402 companies reports that more than half of them increased internal audit resources as a result of Sarbanes-Oxley, with 15% indicating more than a 50% increase (PricewaterhouseCoopers, 2006).

EXTERNAL AUDITOR RELIANCE ON INTERNAL AUDITING

The increased capability and scope of internal audit work has enabled external auditors to rely increasingly on internal audit's work in conducting the external audits. Furthermore, as a result of increasing their investment in internal auditing, companies have sought ways to reduce external audit fees by substituting internal audit work. A 2005 survey of 117 chief internal audit executives found that in 88% of their companies external auditors relied to some extent on the work of the internal auditors (Kaplan & Schultz, 2006).

Relying on internal auditing can avoid unnecessarily duplicating audit procedures. It also can benefit external auditors because internal auditors have certain advantages. The internal auditors generally have more knowledge about the company's procedures, policies, and business environment than do the external auditors. However, external auditors must reconcile the advantages of relying on internal auditing with the need to maintain both the appearance and reality of independence as defined for external auditors.

External auditors may rely on internal auditing primarily in three ways:

- *External auditors may rely on the internal audit function as part of the company's overall system of internal controls;*

- *External auditors may rely on work already done in internal audits relating to testing of internal controls or testing of accounts or transactions;*
- *External auditors may use internal auditors to directly assist them in conducting audit procedures.*

Each of these is discussed next.

Reliance on Internal Audit As Part of Overall Internal Control System

An external auditor's work is influenced by its client's internal controls, as these affect the reliability of the company's financial information. Internal auditing is part of the company's internal control environment.

> *"[Internal auditing] provides a high level of control over processing information and performing activities in an entity . . . Their monitoring activities may reduce the risk of management override of other internal controls. Employees may be more conscientious in performing control procedures. Also, the risk of circumvention of the internal control structure may be reduced. If an entity has developed a code of conduct, internal auditors' monitoring devices may deter prohibited activities (CICA, 1989, p.12)."*

When assessing the company's overall control environment, audit standards mandate the consideration of the internal audit function. Statement on Auditing Standards (SAS) No. 65, *The Auditors' Consideration of the Internal Audit Function in an Audit of Financial Statements*, states that:

> *"[W]hen obtaining an understanding of internal control, the auditor should obtain an understanding of the internal audit function sufficient to identify those internal audit activities that are relevant to planning the audit (AICPA, 1991, AU § 322.04)."*

A good source for identifying relevant internal audit activities would be to obtain the company's internal audit plan, which would indicate the nature, timing, and extent of internal audit work planned during the period. Additionally, to learn whether and how the internal audit function contributes to the overall control environment, external auditors should inquire about internal audit's organizational status within the company and its ability to get unrestricted access to company documents and personnel. The external auditor should be checking to see that the internal audit function has organizational independence, i.e., that it reports both functionally and administratively to levels high enough in the organization to ensure that internal audit is not subject to undue pressures from management and would be expected to receive cooperation from management. Ideally, internal audit should report functionally to the audit committee of the board of directors and administratively to the company's CEO.

Reliance on the Work Performed by Internal Auditors

External auditors may rely on work performed independently by internal auditors. For instance, if internal auditors confirmed a company's receivables, then the external auditors may lower the number of

receivables they otherwise would confirm. However, external auditors need not rely on the work performed by internal auditors if the internal audit activities are not relevant to the financial statement audit (AICPA, 1991, AU § 322.08). Moreover, even when relevant, the external auditor may believe it would not be efficient to use the work of internal auditors, and thus, there need be no reliance in this instance either. Analytical procedures, for instance, are not very time consuming and may very well be more efficiently performed by external auditors.

When reliance is warranted, the internal audit work may affect one or more of the following aspects of the external audit work (CICA, 1989):

- *Procedures to obtain an understanding of the internal controls;*
- *Procedures to assess control risk, including tests of controls;*
- *Substantive procedures, including tests of account balances or classes of transactions.*

For the first category above, the internal audit work could involve documenting the design of internal control systems using flowcharts. In the second category, internal auditors would likely perform audit tests to determine the effectiveness or compliance with internal controls as designed. For instance, in testing cash controls involving bank deposits, the internal auditor might examine bank deposit slips. The third category would have internal auditors performing analytical procedures or conducting direct tests of balances or transactions. The internal auditor might test sales transactions by tracing details from sales invoices to the journal and affected ledger accounts.

In all three of these audit categories, external auditors may rely heavily on internal audit work. Areas least likely to warrant much reliance would include "testing and evaluation of controls affecting extremely material elements of the financial statements; areas where there is a high risk of material financial statement misstatements; or highly subjective areas requiring an inordinate amount of auditor estimation (Engle, 1999, p. 66)." Related party transactions, for instance, would generally be viewed as constituting a high risk of material misstatement. Valuation of assets and liabilities involving significant accounting estimates (e.g., bad debt allowance for accounts receivable) would entail a high degree of subjectivity in evaluating audit evidence. An interesting finding from a study involving materiality is that materiality was significant when the reliance decision related to internal control testing, but was not significant when it involved substantive testing (Whittington & Margheim, 1993). This implies that the size of an account balance or transaction matters when external auditors test internal controls but not in the performance of substantive testing. Hence, while external auditors will tend to rely on internal auditors' substantive testing for both large and small (but not immaterial) amounts, they will place greater reliance on internal auditors' internal control testing when amounts are large rather than when they are small. Therefore, when companies assign work to internal auditors that involve relatively small account balances or transaction amounts, they may wish to direct this work to substantive testing rather than to internal control testing.

One area in particular that would seem to warrant significant reliance on internal audit work is that of fraud risk assessment. Because internal auditors have greater knowledge about a company's operations than external auditors, they are particularly adept at fraud risk assessment. This assertion is supported by KPMG studies which indicate that internal auditors are more likely to discover fraud than external auditors (KPMG, 2003). For instance, while 65% of frauds were discovered in 2003 by internal auditors, only 12%

were discovered by external auditors (KPMG, 2003). So, it would behoove external auditors to rely on internal audit work relating to fraud risk assessment.

Direct Assistance from Internal Auditors

When using internal auditors as direct assistants, the external auditor specifically requests the internal auditors to perform some aspect of the external auditor's work. The external auditors plan the nature, timing, and extent of the testing.

> *"When direct assistance is provided, the auditor should assess the internal auditors' competence and objectivity . . . and supervise, review, evaluate, and test the work performed by the internal auditors to the extent appropriate in the circumstances (AICPA, 1991, AU § 322.27)."*

Except for supervision of internal auditors, these are essentially the same assessments and duties the external auditor should perform as when they rely on work performed independently by internal auditors.

SAS 65 suggests that the external auditor should inform the internal auditors about the following:

- *internal auditors' responsibilities;*
- *objectives of the procedures the internal auditors will perform;*
- *matters that may affect the nature, timing, and extent of the audit procedures;*
- *all significant accounting and auditing issues identified during the audit should be brought to the external auditor's attention (AICPA, 1991, AU § 322.27).*

The first three of these information items serve to enable the internal auditor to perform audit tasks efficiently and effectively. For example, in confirming accounts receivable, the external auditor might instruct the internal auditor how many confirmations to send out so that neither too little nor too many are sent. The external auditor may also convey that it is very important to obtain a high response rate using positive confirmations for a particular group. This objective would guide the internal auditor to take appropriate actions such as using first-class postage rather than metered postage. The fourth item in the above list ensures that internal auditors will transmit important information learned during the course of the audit which the external auditor may not otherwise have known.

A survey of external auditors acknowledges that they frequently use senior internal auditors for junior work (Taylor et al., 1997). External auditors should be careful how the work is assigned to the internal audit staff. The internal auditors should not be made to feel second class. Work assigned should be appropriate to the individual's responsibility level. In essence, the same considerations made when assigning work to their own external audit personnel should be extended to internal audit staff members as well.

Research studies by Maletta (1993) and Maletta & Kida (1993) have found that determinants of internal audit reliance decisions differ depending on whether the reliance decision relates to work already performed by internal auditors versus internal auditors acting as direct assistants to external auditors. The determinants examined were inherent risk, internal control strength, and internal audit quality. For work already performed by internal auditors, internal control strength is a significant determinant of internal audit

reliance, whereas when internal auditors act as direct assistants to external auditors, internal control strength does not affect the reliance decision. This suggests that when a company's internal control strength is deemed deficient, the external auditors should not rely on the internal auditors' work performed, but instead, may consider using them as direct assistants.

CORROBORATION OF INTERNAL AUDITORS' TESTS

The three previous sections have discussed ways in which an external auditor may rely on internal auditors. When relying on work performed independently by internal auditors or performed as direct assistants, the external auditor tests the work of internal auditors. SAS 65 states that in testing internal audit work, the external auditors may either examine "some of the same controls, transactions, or balances examined by the internal auditors" or "similar controls, transactions, or balances not actually examined by the internal auditors (AICPA, 1991, AU § 322.26)." To examine some of the same transactions or balances, the auditor may use either of the following approaches (CICA, 1989):

- *Re-perform the procedures applied to items tested by the internal auditors;*
- *Use different procedures for these same transactions or balances.*

If the external auditor is familiar and comfortable with the procedures used by the internal auditors, then a more direct and efficient corroboration can occur if the external auditor uses these procedures. However, if external auditors wish to ascertain that results are not procedure-specific, then they would be advised to use different procedures than those employed by the internal audit staff.

Re-performing procedures on the same items already tested may not be feasible or warranted. For instance, re-sending accounts receivable confirmations to customers that recently responded to confirmations sent by the internal auditors would possibly alienate those customers. When examining similar transactions and balances not actually examined by the internal auditors, the auditor may use either of the following approaches (CICA, 1989):

- *Apply the procedures used by the internal auditors to similar items;*
- *Use different procedures to test similar items.*

It may not be feasible or desirable to apply the same procedures to similar items. For instance, a company might use a perpetual inventory system for some items and a periodic inventory system for other items. The procedures used by the internal auditors to test the items controlled within the perpetual inventory system might not be appropriate when the external auditor tests items controlled within the periodic inventory system.

The Panel on Audit Effectiveness (2002) has noted that in its review of 126 public company audits, reviewers generally were satisfied in the way external auditors were assessing and reviewing the work of internal auditors and that they generally seemed to have a sufficient basis for internal audit reliance. However, some reviewers questioned whether there was adequate retesting of direct assistance work. Notably in some situations, "the external auditors may not have tested, supervised, and reviewed the internal auditors' work as thoroughly as would have been desirable (Panel on Audit Effectiveness, 2002, p. 63)." The

reviewers commented that in some situations the external auditors demonstrated a lack of professional skepticism. This suggests, particularly, that when using internal auditors as direct assistants, external auditors should take care to adequately corroborate the internal audit work.

IMPACT ON EXTERNAL AUDIT FEES

Internal audit, in assisting the external audit work, can possibly lower the fees otherwise required to pay external audit firms. A reduction in external audit fees might also be the result of a lower assessment of audit risk associated with internal audit involvement in the internal control system. Companies' investments in internal auditing are often made with the intent that total audit costs (internal and external) will be lower than if there is no internal audit function present. Boards of directors sometimes request the external auditor to quantify the audit fee savings of adding an internal auditor to its present staff (Wallace, 1984b).

A survey of external auditors by Wallace & Kreutzfeldt (1991) indicated that they perceived total external audit hours would increase an average of 10% without internal audit functions involved in audits. This is corroborated by a study of 26 companies which found that reliance on internal auditing resulted in a 10% reduction in the external audit fee, on average (Wallace, 1984a). Another study of 70 companies demonstrated that an increase of 1% in the amount of internal audit work that would otherwise be performed by external auditors results in a decreased external audit fee of $8,000 (Felix et al., 2001). One survey of external auditors, however, revealed that internal audit assistance was not a significant determinant of external audit fees for either financial services firms or industrial companies (Stein et al., 1994). Notwithstanding this last survey's finding, it appears that for the most part, companies would significantly reduce external audit fees by promoting reliance on internal audit work.

Research indicates that client fee pressure has a significant effect on the extent to which external auditors rely on internal auditing – *i.e.*, reliance is greater when clients exhibit more fee pressure (Gramling, 1999). Hence, it behooves company management to be proactive in negotiating with external auditors to have them rely on internal audit work. One manifestation of client fee pressure is when the external auditor also provides non-audit services to the client. This pressure can be explicit or implicit. It appears that when significant non-audit services are provided by external auditors, client pressure increases the extent to which external auditors rely on internal audit work (Felix et al., 2005). Note, however, that the Sarbanes-Oxley Act and implementing SEC regulations significantly restrict auditors of public companies from simultaneously providing many non-audit services to the same client.

Interestingly, a study of 401 companies by Goodwin-Stewart & Kent (2006) found that the investment in internal auditing, as measured by the number of internal auditors on staff, is associated with higher external audit fees. "This result suggests that firms that engage in greater internal monitoring through the use of internal audit also demand higher quality external auditing (Goodwin-Stewart & Kent, 2006, p. 388)." One implication of this finding is that CPA firms should not necessarily conclude that just because a client increases its internal audit staff, it intends to reduce its payments to external auditors.

COORDINATION OF AUDIT ACTIVITIES WITH INTERNAL AUDITORS

Reliance on internal auditing is facilitated by having internal auditors and external auditors coordinate their efforts. Coordination of internal and external audits can result in more effective audits conducted at

lower overall cost. Moreover, since duplication of audit effort often disrupts the auditee's operations and staff members, the auditee may be resentful when audit activities are not coordinated, and in turn, may not be fully cooperative with either the internal or external auditors. The Panel on Audit Effectiveness encourages a high degree of coordination and cooperation between internal and external auditors. "This coordination ideally includes communications concerning inherent, control, and fraud risks (Panel on Audit Effectiveness, 2002, p. 62)."

Over the years, coordination of internal and external audits has risen dramatically. While a 1968 survey found that only 12% of internal audit groups formally coordinated activities with external auditors, less than two decades later another survey indicated that this percentage had increased to 81% (Wallace, 1984b). A 2004 study conducted with 11 chief internal audit executives indicated that all of them reported close, supportive working relationships with their external auditor counterparts (Tapestry Networks, 2004). So, companies can be encouraged to try to have their external auditors coordinate activities with their internal audit departments, as it seems that external auditors have increasingly become more receptive to coordination. Notwithstanding this phenomenon, the Treadway Commission (1987) found that internal auditors often concentrate their work at the division or subsidiary level, while external auditors focus their audit examinations largely at the corporate level. Therefore, to promote reliance, internal auditors should consider shifting some of their work to the corporate level.

SAS 65 states the following procedures may be effective for coordination of work between internal and external auditors (AICPA, 1991, AU § 322.23):

- *Holding periodic meetings;*
- *Scheduling audit work;*
- *Providing access to internal audit working papers;*
- *Reviewing internal audit reports;*
- *Discussing possible accounting and auditing issues.*

Not all of these activities involve extra work for the internal audit staff. Internal audit working papers and internal audit reports are prepared for internal audits, so these would not necessitate extra effort on the part of internal auditors. Internal auditors should encourage external auditors to access their working papers and should provide external auditors with all of their written reports.

The Institute of Internal Auditors (IIA) Standards, International Standards for the Professional Practice of Internal Auditing, also address this issue of coordination by stating that "the chief audit executive should share information and coordinate activities with other internal and external providers of relevant assurance and consulting services (IIA, 2003, section 2050)." This coordination is intended to ensure adequate coverage and minimize duplication of efforts.

For effective coordination, the internal and external auditors should obtain the following information (CICA, 1989):

- *Planned internal audit work for the period;*
- *General audit plan of the external auditors;*
- *Changes in the entity that may affect audit requirements;*
- *New reporting or regulatory requirements that may affect audit requirements;*

- *Tests that must be performed by the external auditors (due to risk, materiality, etc.);*
- *Availability of both internal and external auditors;*
- *Significant audit issues;*
- *Completed audit reports (or at least executive summaries);*
- *Audit working papers.*

This information would be obtained through the various coordination procedures listed earlier in this section.

In addition to external auditors' reliance on internal audit benefiting from coordination between the two, the coordination can also aid the internal auditors in establishing their internal audit plan.

> *"Internal auditors should also review the external auditors' critical workpapers, such as the proposed but waived adjustment entries and supporting documentation, and management letter comments . . . these reviews can alert internal auditors to areas requiring more extensive testing than external auditors commonly perform (Jarvis & Moran, 1992, p. 53)."*

So, just as external auditors use internal audit working papers and internal audit reports to guide them in their audits, internal auditors should use the results of external audit work to pinpoint areas that need their attention for future internal audit work.

Common problems encountered in coordination efforts include (Wallace, 1984b; Treadway Commission, 1987):

- *Last-minute changes by external auditors;*
- *External auditors not sharing with internal auditors substitution ratios of internal audit hours for external audit hours;*
- *Lack of internal auditor's input into management letters and little acknowledgement of the positive contribution of internal auditors to the overall control environment;*
- *External auditors not receiving internal audit reports;*
- *Insufficient involvement of internal auditors in auditing the corporate level, as opposed to just the division or subsidiary level.*

Some of these problems can be attributed to internal auditors (e.g., external auditors not receiving internal audit reports), but it seems that the majority are attributable to external auditors. Problems such as these have led to alienation of internal auditors. A survey of internal auditors reports that "internal auditors feel their efforts and work product are not appreciated by the external auditors (Taylor et al, 1997, p. 37)." If external auditors wish to promote client satisfaction, they should take care to ensure that their clients' internal auditors are treated properly.

Coordination between internal and external auditors has become an even more important issue since enactment of Sarbanes-Oxley. Comment letters received by the SEC pertaining to implementation of Section 404 of Sarbanes-Oxley revealed that many internal auditors were unhappy about the scope and degree of detailed testing performed by external auditors for internal control audits (Cornett et al., 2006). Many internal auditors expressed dissatisfaction about duplication of efforts occurring, such as internal and external audit teams visiting the same locations at essentially the same time period and performing essentially the same audit

procedures. All in all, the "clear consensus among internal auditor respondents was that relationships with their external auditors had been negatively impacted by the Section 404 compliance process (Cornett et al., 2006, p. 21)." This is reinforced by the findings from a survey of 17 chief internal audit executives of public companies, who largely felt that the relationship between internal and external auditors has deteriorated since passage of Sarbanes-Oxley (Nagy & Cenker, 2007). "The significant amount of work and responsibility placed on both the external and internal auditors with limited guidance created heightened anxiety and frustration for the participants involved (Nagy & Cenker, 2007, p. 44)." Hence, it is even more imperative than before Sarbanes-Oxley was enacted for internal and external auditors to make efforts to coordinate their work. External auditors should take special care to avoid merely duplicating the internal audit work during site visits that overlap with internal audit site visits.

Coordination can be enhanced if both internal and external auditors are using similar audit methods, internal control documentation, and working paper techniques. This is often facilitated by CPA firms that provide training sessions for internal auditors. In fact, some companies require all new internal audit staff members to take auditing courses offered by their CPA firms (Wallace, 1984b).

Audit committees can also facilitate coordination between internal and external auditors, as they often oversee the work of both of these auditors. However, a survey of 118 audit committee members reports that the respondents generally did not feel that reviewing the coordination of internal and external auditor work is one of their assigned responsibilities even though this responsibility was generally listed in their companies' proxy statements (DeZoort, 1997). Companies' boards of directors should, therefore, further stress and monitor their audit committees' efforts in coordinating internal and external auditing.

Research on coordination between internal and external auditors indicates that the importance of coordination in the decision of external auditors to rely on internal auditing increases as inherent risk increases (Felix et al., 2001). Therefore, companies having high inherent risk conditions should be most mindful of the need to coordinate internal and external audit work if they wish to promote reliance on their internal audit departments. Also, the level of client interest in having coordination between the internal and external auditors is a significant determinant in the reliance decision, but only when external auditors have had prior satisfactory experience with the internal audit department (Campbell, 1993).

INTERNAL AUDITORS AS A POINT OF COMMUNICATION

While, historically, external auditors have considered the client's chief financial officer as the primary point of contact and the main relationship within the client company, some advocate an expanded circle that would include internal audit (Antoine, 2004). As one CPA firm's partner has stated, "Although external auditors are not going to stop returning calls to the CFO, we're going to strengthen our relationships with the internal auditor and the audit committee (Vallario, 2003, p. 28)." Research has indicated that perceived communication barriers between clients and the audit firm impacts the extent of reliance placed by external auditors on internal auditing (Brody et al., 1998). This implies that companies wishing to promote internal audit reliance should take actions to facilitate communication between the external auditors and company personnel, including the internal auditors.

CONCLUSION

This paper has described the growth of internal auditing and its resultant role in the consideration of external audits. The paper contributes to the understanding of how external auditors rely on the work of internal auditors, the impact of reliance on external audit fees, and ways of facilitating reliance by analyzing applicable professional standards and research findings. The recommendations and examples contained in the analyses should assist external auditors with their reliance decisions on internal audit work. Corporate management who wish to reduce external audit costs by maximizing external auditor reliance on internal auditing should also benefit from the recommendations and examples in the analyses.

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INVESTOR SENTIMENT AS INTERVENTION OF STOCK MARKET RETURNS

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ABSTRACT

The relationship between investor sentiment and equity returns continues to be a topic of interest in financial market analysis. In this study, we use the event of September 11, 2001 as an occurrence that may contain relevant information additional to conventional market fundamentals. Using interrupted time series analysis and ANCOVA, we test for a change in investor sentiment as a result of the event and its impact on stock returns. We find, as have other researchers, that several indices of investor and consumer sentiment are contemporaneously related to stock returns as measured by the Standard and Poor 500 index. Contrary to previous findings, however, we also find that one index of investor confidence reliably predicted the Standard and Poor 500 index in the post September 11 recovery period.

INTRODUCTION

The possible effect of investor sentiment on equity returns remains one of the yet to be resolved issues in financial market analysis. As opposed to the conventional noise trader theoretical framework, the sentiment formation process has been approached from an unique event perspective by several recent studies such as Garner (2002), and Burch, Emery, and Fuerst (2003), and the event of September 11, 2001 has been used as a natural test of this hypothesis. Using intervention analysis, our study expands on this line of inquiry by statistically relating the formation of sentiment under this unique event scenario to its impacts on stock market returns.

The noise trader models as developed by De Long, Shleifer, Summers, and Waldmann (1990) contend that uninformed traders acting in concert of non-fundamental signals can introduce a systematic risk that will be priced by the market. To the extent that noisy traders based their trading decisions on investor sentiment, such measures will have additional predictive power beyond conventional fundamental factors. As an empirical matter, the statistical evidence so far are mixed at best. Studies such as Neal and Wheatley (1998), Wang (2001), Simon and Wiggin (2000), Lee, Jiang, and Indro (2002), Wang, Keswani, and Taylor (2003), Fisher and Statman (2003), Brown and Cliff (2005), Tetlock (2007), and Baker and Wurgler (2007), using various proxies for sentiment such as closed end fund discounts and directly observed consumer/investor surveys, find evidence that seem to suggest that some of the sentiment measures indeed predict equity returns, However, although the Brown and Cliff study attempted to control for the influences of fundamental factors explicitly, it still remains unclear in general whether the sentiment measures reflect additional independent explanatory power of their own.

The events of September 11, 2001 were sudden and unexpected, and represent a totally exogenous shock to the world financial markets, independent of any market fundamentals. Using September 11 as an unique event analysis, Burch, Emery, and Fuerst (2003) find that in the aftermath of the events small-investor sentiment shifted significantly into the negative immediately. It did not rebound to its pre-attack level until well after the market recovered. In the same vein, Garner (2002) suggests that sentiment indexes which normally contain relatively little information that is not available from other indicators might, however, under special circumstances such as this one, contain unique information that is not readily apparent from other sources. His results, however, show consumer sentiment indexes in this particular instance maintained a fairly normal relationship to other economic variables subsequent to the attack, and as such, did not contain much relevant new information. This line of reasoning is also consistent with the recent behavioral finance literature which places the emphasis on the effect of investor mood on asset prices. In their recent study, Edmans, Garcia and Norli (2007) use sport event outcomes to identify the sudden changes in the moods of investors and their impacts on market performance. Their results show strong negative stock market reaction to losses by national soccer teams. In this study, we take it as given that September 11 was an unique event that may contain relevant information additional to conventional market fundaments. Using interrupted time series analysis and ANCOVA, we test for the change in investor sentiment as a result of the event and its impact on stock returns.

THE INTERVENTION MODEL AND DATA

Denoting the time series full impact intervention model as

$$Y_t = f(I_t) + N_t$$

where Y_t represents the time series of interest, I_t the intervention component or the transfer function, and N_t the noise component of the stochastic process. The intervention function, I_t, can be specified to allow estimated results to exhibit distinct shock patterns. For instance, an abrupt but constant pattern can be associated with a zero-order transfer function, a gradual and constant pattern can be estimated if the transfer function is determined to be of the first order, and an abrupt and temporary pattern can be specified by first differencing I_t.

Identifying the independent variable, Y_t, as the stock market return and the intervention component, I_t, as a measure of investor sentiment, the above model is tested using both monthly and weekly observations for the sample period September 1990 to October 2003. For both data frequencies, stock market return is measured by the natural log first difference of the Standard and Poor's SP500 index,

In the case of monthly observations, both the Conference Board's Consumer Confidence Index and the Index of Consumer Sentiment from the surveys conducted by the University of Michigan are used as investor sentiment indicator. Both indexes are broadly similar in that they represent monthly surveys of US household expectations; they differ in terms of their emphasis. While the Michigan index focuses more on the individual's own financial conditions, the Conference Board index puts more weight on macroeconomic conditions. Furthermore, previous studies such as Bram and Ludvigson (1998) have found the Conference Board measure to have statistically significant explanatory power for several economic variables, while the Michigan measure tends to have weaker predictive power.

Three measures are used as investor sentiment indicators in the estimations using weekly observations: the Consensus Index (CI), the American Association of Individual Investors (AAII) index, and Market Vane survey data. As the name implies, the AAII index is constructed primarily in terms of moods and opinions expressed by small, independent investors. On the contrary, the Consensus Index and the Market Vane Index are surveys of market professionals who are more sophisticated and informed investors. Specifically, the CI index reflects the positions and attitudes of major brokerage firms and advisors and the Market Vane index is the measure of futures market sentiment generated by a collection of leading commodity trading advisors.

The assessment of the existence of an association between stock-market returns and investor sentiment indicators is done in two stages for each data set. First, the existence of an exogenous shock at the time period specified is examined; then the parameters of the function $f(I_t)$ are estimated. Formally, the following two hypotheses (one primary, one contingent) are tested against their negation with each data set:

H1: There is no exogenous effect on the Standard & Poor 500 index associated with September 11, 2001

H2: There is no relationship between measures of investor sentiment and the Standard & Poor 500 index

ESTIMATION AND ANALYSIS - MONTHLY DATA: 1/1990 – 3/2004

The variables in the equations to be estimated are listed and described below, along with transformations (expression).

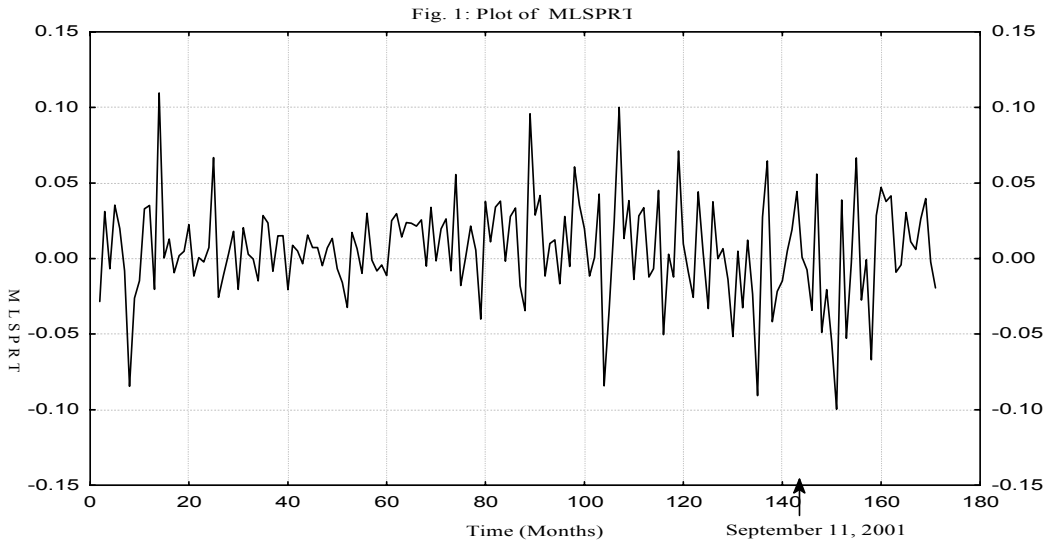
Table 1: Variables: Monthly Data

Type	Name	Expression	Description
Dependent	MLSPRT	$Ln(SP_t/SP_{t-1})$	Natural logarithm of the monthly proportional change in SP500
Independent	CBDIF	$CB_t - _{Cbt-1}$	Monthly change in the Conference Board confidence index
	LNCBRT	$Ln(CB_t/CB_{t-1})$	Natural logarithm of the monthly proportional change in CBI
	UMDIF	$UM_t - _{Umt-1}$	Monthly change in the U. of Michigan confidence index
	LUMRT	$Ln(UM_t/UM_{t-1})$	Natural logarithm of the monthly proportional change in UMI
	IXXI		Binary Indicator. 0 – Pre 9/11/01 1 – Post 9/11/01

Lagged values of one period are indicated by appending a "-1" to a name shown above. Note that independent variable MLSPRT is in effect first differences in logarithms.

EXISTENCE OF EFFECT

The existence of an effect of the S&P 500 index is assessed through an ARIMA interrupted time-series intervention analysis. No effects are readily apparent in the series plot below.



The full and partial autocorrelations of the MLSPRT series exhibit a short-term autoregressive pattern with no seasonal components (see autocorrelation estimates below). An ARIMA (1, 0, 0) model was fit with an event at observation 141: September 11, 2001. An abrupt-temporary type of shock was hypothesized.

Table 2: ACF and PACF of MLSP500RT

Lag	ACF	SE	PACF	SE
1	0.197*	0.076	0.197*	0.076
2	0.020	0.076	-0.019	0.076
3	0.005	0.076	0.004	0.076
4	-0.034	0.076	-0.037	0.076
5	0.102	0.076	0.121	0.076
6	0.011	0.076	-0.035	0.076
7	0.061	0.076	0.070	0.076
8	0.124	0.076	0.100	0.076
9	0.130	0.076	0.103	0.076
10	0.092	0.076	0.036	0.076
11	0.032	0.076	0.019	0.076
12	0.023	0.076	0.014	0.076

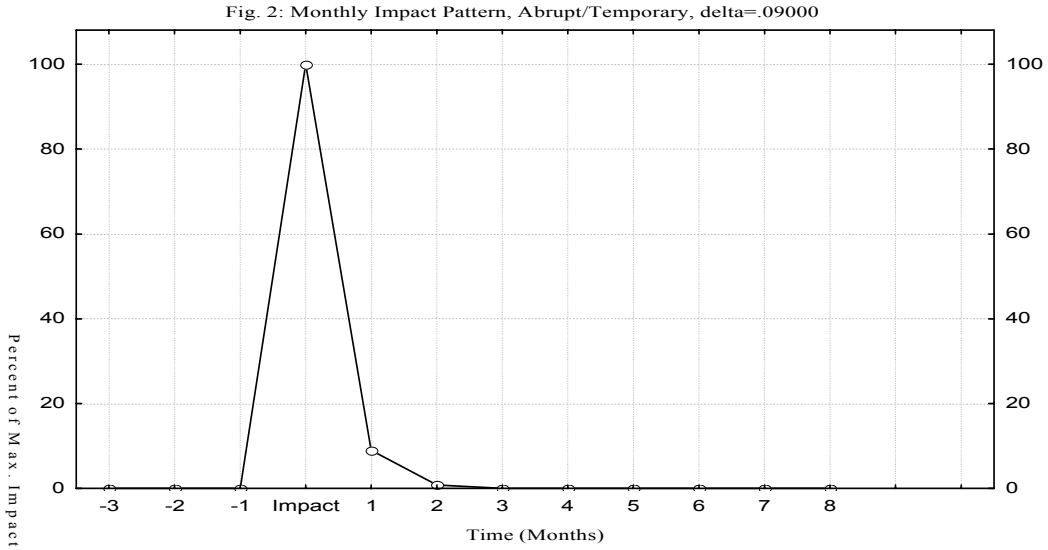
The estimated model parameters shown below confirm a fit of an ARIMA (1, 0, 0) pattern and the existence of an intervention, as shown below. Note that the significance of the magnitude coefficient Omega

is not confirmed at a significance level of 0.05 or less, but that of the persistence coefficient Delta is. This seems a contradiction, since if there was no shock, then there was no effect to dissipate. This seeming contradiction can plausibly be explained by the monthly frequency of the data, which results in a lag of almost three weeks from the event. This affects the estimates of both the magnitude of the impact (reducing it) and its decay rate (increasing it). Analysis of the residuals indicate stationarity and no residual correlation.

Table 3: Parameter Estimates: ARIMA (1,0,0) with Shock

Parameter	Value	SE	t	p	Shock Period	Shock Type
p(1)	0.259	0.077	3.347	0.001		
Omega(1)	0.065	0.034	1.879	0.062	141	Abrupt/Temp
Delta(1)	0.510	0.246	2.073	0.040	141	Abrupt/Temp

The estimated intervention pattern indicates an impact reaching 100% (an increase of 0.065 in MLSPRT: 1.87 standard deviations) in ½ period (2 weeks) and declining over a period of approximately 7 months.



ASSOCIATION WITH INVESTOR SENTIMENT

Since the monthly S&P 500 data show an abrupt/temporary shock pattern, a transfer function consisting of differences is indicated. ANCOVA models with indices of investor sentiment as covariates were estimated, one for each of the combinations shown below for each of the two indexes of investor confidence (Conference Board and University of Michigan). Again, the parameters to be estimated are of the following function:

$$MLSPRT_t = \beta_0 + IXXI + \beta_1(\text{Differenced Index})_t + \beta_2\ IXXI*(\text{Differenced Index})_t$$

A significant difference in the intercept (significant date indicator IXXI) of an MLSPRT estimate would indicate a pre/post difference in its level (shift) associated with investor sentiment. Since the dependent variable represents relative monthly change, this would indicate a shift in the average magnitude of monthly changes. A significant difference in the slope (significant interaction term) of an MLSPRT estimate would indicate a pre/post difference in its rate of change (a knot) associated with investor sentiment. This would indicate an alteration in the volatility of the measure associated with investor sentiment. Furthermore, significant parameters with contemporaneous values would indicate a relationship between LNSPRT and an investor sentiment index, but with no predictive power, whereas significant parameters with lagged index values (linking $MLSPRT_t$ with $Index_{t-1}$) would indicate an association with predictive power.

ESTIMATES WITH THE CONFERENCE BOARD INDEX (CB)

The differential slope models with both indices in both expressions (a total of 4) have significant parameters, but none of those involve lagged values. That indicates that neither of the indices had predictive power. Again, as in the estimation of the shock pattern, that is not surprising. The combination of a monthly frequency and the high volatility of both indices (the monthly changes in both indices have large coefficients of variation: CBDIF has a mean of -0.106 and a standard deviation of 6.378; UMDIF has a mean of 0.017 and a standard deviation of 3.919) suggests that a month ahead is too long of a forecast horizon.

Those fits with the highest adjusted R^2 will be discussed, although the differences are slight. The overall fit is poor and no main effects are significant, but the key interaction parameters are. The tables below show the overall fit and the parameter values for the following models:

Table 4: Overall Fit

Adj. R^2	SS Model	df Model	SS Error	df Error	MS Error	F	p
0.114	0.026	3	0.177	166	0.001	8.274	0.000

Table 5: Parameter Estimates

Effect	Level	Parameter	SE	t	p
Intercept	0.0032	0.006	0	0.534	0.594
IXXI*CBDIFF	1	0.0016	0.0005	3.542	0.001
IXXI*CBDIFF	2	0.0026	0.0007	3.399	0.001

The significant coefficients for the interaction term (Level 1 refers to the pre–intervention period; Level 2 to post) confirms a pre/post difference in the rate of change in the ratio of successive SP500 values associated with the Conference Board Index of investor confidence, and indicates that the change in the Conference Board index of investor confidence (CBDIF) is a reliable covariate with the change in the weekly

SP500 in both the pre- and post-shock intervention period Analysis indicates that the residuals from this model are stationary, Gaussian, and homoscedastic.

ESTIMATES WITH THE UNIVERSITY OF MICHIGAN INDEX

These estimates show a very similar fit, confirming not only the relationship of the Michigan Index with MLSPRT and the intervention, but also lending additional credence to the CB fit. Again, the residuals show no evidence against stationarity, Normality, and homoscedasticity.

Table 6: Overall Fit

Adj. R^2	SS Model	df Model	SS Error	df Error	MS Error	F	p
0.124	0.028	3	0.175	166	0.001	9.004	0.000

Table 7: Parameter Estimates

Effect	Level	Parameter	SE	t	p
Intercept	0.0001	0.006	0	0.018	0.986
IXXI*LUMRT	1	0.2228	0.0614	3.625	0.000
IXXI*LUMRT	2	0.4435	0.1237	3.586	0.000

ESTIMATION AND ANALYSIS - WEEKLY DATA: 9/10/90 to 10/6/03

The variables in the equations to be estimated are listed and described below, along with transformations (expression).

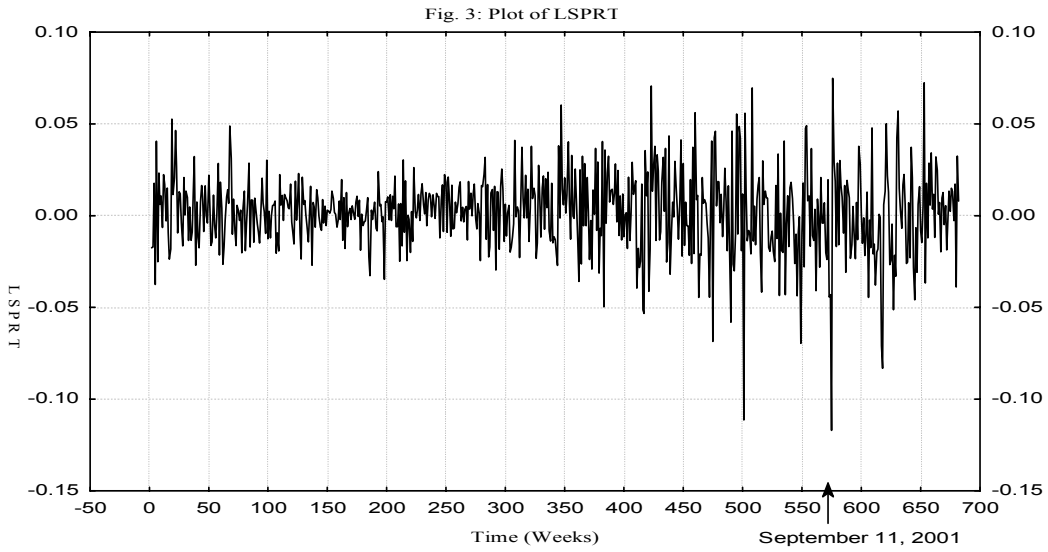
Table 8: Variables

Type	Name	Expression	Description
Dependent	LSPRT	$Ln(SP_t/SP_{t-1})$	Natural log of weekly proportional change in S&P 500 index.
Independent	CIDIF	$CI_t - _{Cit-1}$	Weekly change in the investor Consensus Index (CI)
	LNCIRT	$Ln(CI_t/CI_{t-1})$.	Natural logarithm of the weekly proportional change in the CI
	AAIIDIF	$AAII_t - AAII_{t-1}$	1st differences in th American Institute Investor Sentiment index.
	LNAIRT	$Ln(AAII_t/AAII_{t-1})$	Natural logarithm of the weekly relative change in the AAII
	MVDIF	$MV_t - _{Mvt-1}$	Weekly change in the Market Vane index of investor sentiment.
	LMVRT	$Ln(MV_t/MV_{t-1})$	Natural logarithm of the weekly relative change in the MVI
	IXXI		Binary Indicator 0 – Pre 9/11/01 1 – Post 9/11/01

Lagged values of one period are denoted by appending with a "-1" to the names above Note that dependent variable LSPRT is in effect first differences in logarithms.

EXISTENCE OF EFFECT

The existence of an effect on the S&P 500 index is assessed through an ARIMA interrupted time-series analysis. A volatility effect (greater and more frequent proportional changes) is apparent in the series plot below, which is not a surprising effect following a momentous event.



Although the full and partial autocorrelations of the LNSPRT series exhibit short-term autoregressive and moving average patterns, plus a seasonal moving-average pattern (see autocorrelation estimates below), the full short-term AR-MA component was not jointly estimable. An ARIMA (1, 0, 0)(0, 0,1) model was fit with an intervention at observation 574: September 11, 2001. An abrupt-permanent type of intervention was hypothesized.

Table 9: Autocorrelations of LnSP500RT (* denotes significant values)

LAG	ACF	SE	PACF	SE
1	-0.087*	0.038	-0.087*	0.038
2	0.056	0.038	0 .049	0.038
3	-0.030	0.038	-0.022	0.038
4	-0.047	0.038	-0.055	0.038
5	-0.035	0.038	-0.041	0.038
6	0.071	0.038	0.071	0.038
7	-0.070	0.038	-0.058	0.038

Table 9: Autocorrelations of LnSP500RT (* denotes significant values)				
LAG	ACF	SE	PACF	SE
8	-0.038	0.038	-0.062	0.038
9	-0.032	0.038	-0.034	0.038
10	0.067	0.038	0.073	0.038
11	0.101*	0.038	0.115	0.038
12	-0.018	0.038	-0.027	0.038

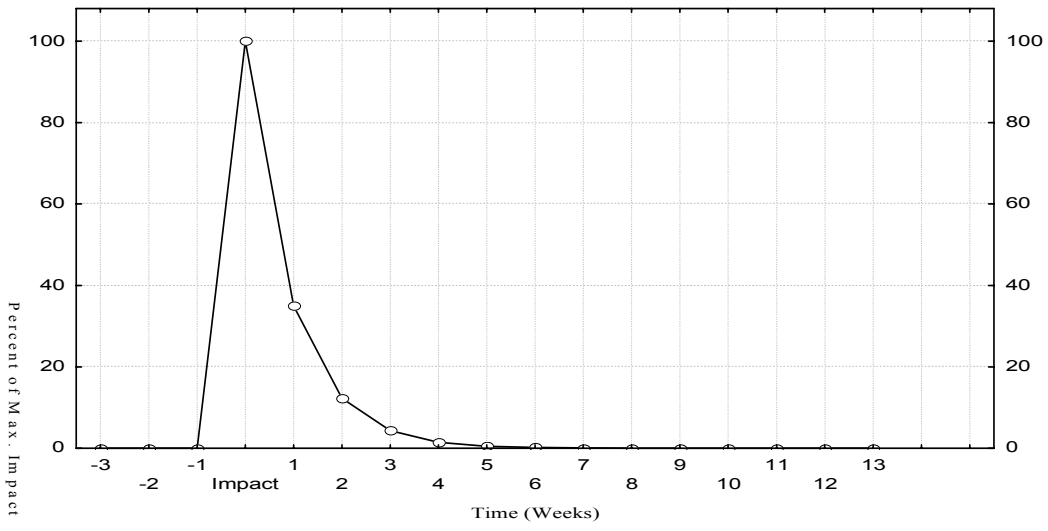
The estimated model parameters confirm the fit of an ARIMA (1, 0, 0)(0, 0, 1) pattern and the existence of an intervention, as shown below.

Analysis of the residuals indicates stationarity and no residual autocorrelation.

Table 10: Parameter Estimates: ARIMA (1,0,0)(0,0,1) with Shock						
Parameter	Value	SE	t	p	Shock Period	Shock Type
p(1)	-0.117	0.039	-3.007	0.003		
QS(1)	-0.106	0.037	-2.906	0.004		
Omega(1)	-0.074	0.020	-3.666	0.000	574	Abrupt/Temp
Delta(1)	0.353	0.124	2.836	0.005	574	Abrupt/Temp

The estimated pattern shown below indicates a significant shock (interruption) of an abrupt/temporary type, with a rapid impact (Omega parameter) reaching 100% (a 0.074 decline in the units of LNSP500RT—3.365 standard deviations) in ½ a period (week), then falling at a rate of 35.3% (Delta parameter) and persisting for approximately 5 weeks.

Fig. 4: Impact Pattern, Abrupt/Temporary, delta=.35000



ASSOCIATION WITH INVESTOR SENTIMENT

The type of shock pattern estimated above suggests a transfer function I_t consisting of first-order differences. ANCOVA models with indices of investor sentiment as covariates were estimated, one for each of the combinations shown below for each of the three indexes of investor sentiment (Consensus Index, AIIA Index, and Market Vane) in contemporaneous and lagged forms. The parameters to be estimated are of the following equation:

$$LNSPRT_t = \beta_0 + IXXI + \beta_1 (Differenced\ Index)_t + \beta_2\ IXXI*(Differenced\ Index)_t$$

A significant difference in the intercept (significant date indicator IXXI) of an LNSP500RT estimate would indicate a pre/post difference in its level associated with investor sentiment. Since the dependent variable represents relative weekly change, this would indicate a shift in the average magnitude of weekly changes. A significant difference in the slope (significant interaction term) of an LNSPRT estimate would indicate a pre/post difference in its rate of change (a knot) associated with investor sentiment. This would indicate an alteration in the volatility of the measure associated with investor sentiment. Furthermore, significant parameters with contemporaneous values would indicate relationship between LNSPRT and an investor sentiment index, but no predictive power, whereas significant parameters with lagged index values (linking $LNSPRT_t$ with $Index_{t-1}$) would indicate predictive power.

Only the functions with contemporaneous MVDIF values and with the lagged and logged ratio of the AAII index (a difference in logarithms) had significant parameters. The latter is of particular interest, because it indicates that the AAII index had predictive power. The overall fit is poor in explanatory power (but statistically significant overall), and no main effects are significant, but the key interaction parameter is significant. The tables below show the overall fit and the parameter values for the following model:

Table 11: Overall Fit

Adj. R^2	SS Model	df Model	SS Error	df Error	MS Error	F	p
0.008	0.004	3	0.324	676	0.0005	2.775	0.043

Table 12: Parameter Estimates

Effect	Level	Parameter	SE	t	p
Intercept		-0.0005	0.0021	-0.237	0.8125
IXXI*LNAIRT-1	2	0.0193	0.0095	2.027	0.0431

The positive and significant coefficient for the interaction term at level 2 (which refers to LNAIRT-1 in the post–shock intervention period) confirms a pre/post difference in the rate of change in the ratio of successive SP500 values associated with investor sentiment, and indicates that the change in the AAII of investor confidence (LNAIRT) is a reliable predictor of the change in the weekly SP500 in

the post-shock intervention period. Analysis indicates that the residuals from this model are stationary, Gaussian, and homoscedastic.

INTERPRETATION AND CONCLUSION

The results are quite clear with respect to the two formal hypotheses tested. First, it is clear that the series of logged ratios of successive weekly and monthly S&P 500 values experienced a significant interruption on September 11, 2001, and that the effect can be modeled in form of an abrupt/temporary shock. Secondly, it is clear that investor sentiment as measured by publicly-available indices reliably tracked the recovery from the shock. Furthermore, the association was significant in both the pre- and post-shock intervals with the smoother monthly data, whereas the association was significant only post-shock for weekly data.

The contemporaneous association between the two investor indices (Conference Board and University of Michigan) and the S&P 500 is interesting, but somewhat to be expected, since it merely implies that the general mood of investors and consumers proceeded in concert. Clearly, the most interesting result is the predictive power of the AAII, which indicates that the changes in the confidence of small, independent investors (the basis of the AAII samples) led (intervened in) the recovery, and could be used to predict the changes in the S&P 500 reliably in the post-shock period.

This is consistent with the findings of Burch, Emery, and Fuerst (2003). In their event study, small investor sentiment, as measured by the AAII index, moved immediately into the negative following the events of September 11, 2001. It is entirely within reason that, as opposed to seasoned investors whose sentiments are more reflective of underlying market forces, small investors are more susceptible to emotional influences, and their sentiments extend beyond those suggested by conventional fundamental factors.

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THE PERFORMANCE AND DETERMINANTS OF FIRMS THAT REPRICE OPTIONS DURING A BEAR MARKET

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ABSTRACT

I examine a sample of firms that perform stock option repricings during the bear market of 2001. Repricings are preceded by an average one-year return of -62.7% and are directly associated with poor industry performance. After controlling for industry, prior performance, size, and underwater options, I find that repricing firms have a greater need to realign incentives than non-repricing firms and their stock prices perform better after repricing. My results are consistent with firms repricing options to restore the incentive effects of stock options and to retain existing employees.

INTRODUCTION

In 2001 stock markets declined. The decline caused incentive stock option holdings to become deep out-of-the-money ("underwater") for numerous employees. In response, many firms repriced employee stock options by lowering the exercise prices of these options. This practice of repricing of employee stock options is controversial.

Proponents of repricing argue that options are often underwater because the stock market or industry declines, not because of firms' poor performance. The repricing of employee stock options can realign employee incentives with stockholders' interests by retaining valuable employees (Gillan, 2001).

Consistent with the proponents' argument, Acharya, John, and Sundaram (2000) develop a model showing that repricing can increase firm value. They argue that although option repricing may weaken the employees' initial incentives to maximize firm value due to their knowing that their options may be repriced, repricing does allow firms to restore incentives of employees whose options are underwater.

Saly (1994) argues that option repricing is optimal if poor stock price performance is industry- or market-driven. The results in her study suggest that leaving exercise prices of employees' options unchanged penalizes employees for factors outside their control and result in reduction of employees' work incentives. Therefore, repricing may restore employees' work incentives and subsequently enhance firm value.

Repricing proponents further argue that employees can effectively reprice options *themselves* by accepting new employment with firms that offer options as part of the compensation package. This creates undesired managerial and employee turnover that may decrease a firm's value. Furthermore, managers and employees who are most likely to leave the firm for opportunities elsewhere are usually those with valuable transferable attributes. Those that remain are more likely to engage in value decreasing activities. Restoring employee incentives through option repricing realigns the interest of employees with shareholders.

Repricing opponents ascribe declines in stock prices to firm-specific factors. They argue that repricings reward poor performance and serve to entrench poorly performing managers, employees, and board of directors, and transfer wealth away from shareholders (Chance, Kumar, and Todd (2000)).

To investigate the reasons why firms reprice their options I address the following research questions: (*i*) is the poor stock price performance prior to repricing due to market (industry) or firm-specific factors; and (*ii*) are option repricings associated with greater agency problems that benefit employees at the expense of shareholders or do repricings realign employees' incentives with shareholders' interest.

I find that the stock performance of repricing firms is highly associated with the industry in which they operate. Industry returns at the 4-digit SIC code explain over 56% of the repricing company's one-year return prior to the repricing. In other words, the poor performance of firms with underwater options was mainly due to industry-related factors. I also find that compared to a match-sample of non-repricing firms, repricing firms are less likely to have agency problems because repricing firms are larger, less likely to have the CEO as the chairman of the board, and CEO stock ownership is lower. Moreover, repricing firms have a greater need to realign incentives because they have options that are more out-of-the-money (*"underwater"*). In short, the results in my paper support the proponents' repricing arguments.

Finally, if repricing realigns employees' incentives with shareholders' interest, the long-term stock price performance of firms after the repricing should be better than similar firms whose options are also underwater but choose not to reprice them. To investigate if repricings realign incentives and improve performance I address the following research questions: (*i*) is the repricing filing date associated with positive abnormal returns; and (*ii*) does option repricing improve long-term stock price performance after the repricing.

The results in my paper show that firms filing repricings with the SEC do not experience positive abnormal returns surrounding the filing date. I do, however, find that repricing firms outperform their counterparts after filing their repricings with the SEC and most of the performance improvement occurs within six months after filing.

LITERATURE REVIEW

Stock options are increasingly an important component of executive compensation (Lebow, Sheiner, Slifman, and Starr-McCluer, 1999), especially in high-tech industries (Greene, *et al*, 2003) and for firms with higher market-to-book values (Core and Guay, 1999). Moreover, Mehran and Tracy (2001) report that there is an increasing trend of issuing stock options to employees below the top management level during the 1990s.

Saly (1994) finds that option repricings increase after a downturn in stock market and concludes that repricings are optimal after such downturns because leaving the exercise price intact penalizes executives for factors outside their control and results in executives putting forth less effort. Chance, Kumar, and Todd (2000) find no significant market reaction to the disclosure of option repricing at the proxy filing date. They also find that repricings are preceded by poor firm-specific stock price performance in the year prior, and that firms where agency problems are more severe, namely small firms with insider-dominated boards and more free cash flow, are more likely to reprice executive stock options. Carter and Lynch (2001), however, find that stock option repricings are unrelated to agency problems.

Brennar, Sundaram, and Yermack (2000) investigate stock option repricings and find that the probability of repricing is higher when: prior firm specific stock price performance is worse; there is a disclosed conflict of interest in the board of director compensation committee; and firms are smaller.

SAMPLE SELECTION AND UNIVARIATE RESULTS

Institutional Setting

Figure 1 outlines the event sequence for *delay* stock option repricings. Delay repricings represent a new type of repricing that avoids accounting charges to earnings when certain requirements set forth by Financial Accounting Standard Board (FASB) FIN 44 are met. Delay repricings begin with a Security and Exchange Commission (SEC) tender offer statement filing. The *offer period* is the period between the SEC filing date and the expiration date of the offer. During this period of time, which must be at least 20 business days, participants may voluntarily decide whether or not to tender options that are specified in the exchange offer[1]. The *look-back period* is the six-month period before the *cancellation date* for options tendered – the date on which firms cancel properly tendered options eligible for exchange. The cancellation date is usually the same as the *expiration date* of the offer or shortly thereafter (e.g. the next business day). If a firm wants to avoid a charge to earnings, it must follow the following rule: if a participant chooses to tender any option eligible for exchange, he or she must also tender all options granted during the six-month *look-back period* regardless of the exercise price on the options granted during the look-back period[2]. The *expiration date* is either the last date that participants can tender options eligible for exchange or if they have already tendered options, it is the last date that they can withdraw their tender.

The firms' cancellation of properly tendered eligible options by participants is the beginning of the *waiting period*. This period, which must be longer than six months in order to avoid a charge to earnings, is the time between the *cancellation date* and the *replacement grant date*.

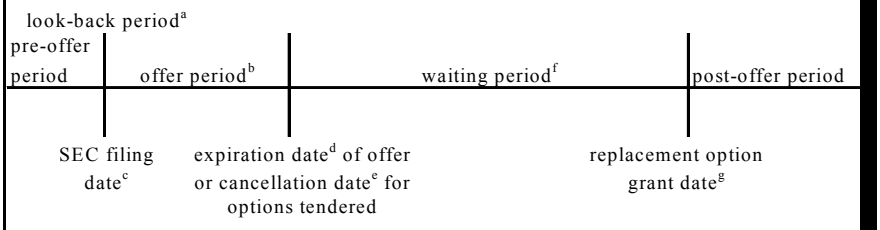
Repricing Sample

In 2000 the SEC became aware of firms offering stock option repricings and began advising securities lawyers that it considered stock option repricings to be tender offers in certain cases and recommended that firms repricing options file a tender offer statement with the SEC. As a response to the SEC recommendation, firms began option repricing electronic filing in December 2000. On March 31, 2001, the Division of Corporation Finance at the SEC officially issued an order requiring firms registered with the SEC to file tender offer statements when performing repricings. My sample begins with the first firm to electronically file a stock option repricing on a tender offer statement with the SEC in December 2000 and ends on December 31, 2001[3].

In Table 1 I present the *type* of stock option repricings filed with the SEC during the sample period. The sample includes firms that have return information on Center for Research of Securities Prices (CRSP) tapes and are not associated with any type of asset rearrangement (e.g., mergers). In *Panel A* of Table 1, the SEC filings are classified by how exercise prices are set. There are 131 (81%) delay repricings and 31 (19%) immediate repricings. Immediate repricings do not have a look-back or waiting period, and this results in the replacement option grant date being the same date as the expiration date of the offer. Overall, the statistics

suggest that most firms are engaging in delay repricings to avoid the earnings charge associated with immediate repricings.

Figure 1
Delay option repricing sequence of events.



[a]The look-back period is the six month period before the cancellation date. Any eligible participant that elects to tender any options for exchange must tender all options granted during the six month look-back period, regardless of the exercise price of the option granted during this period.

[b]The offer period is the period between the SEC filing date of the stock option exchange offer and the expiration date of offer. The offer period is the period of time that eligible participants decide to tender, or not to tender, eligible options for exchange. The offer period must be at least 20 business days by SEC rule.

[c]The SEC filing date is the date that firms commence delay option repricing procedures by filing tender offer statements with the SEC.

[d]The expiration date is the last date that eligible participants can tender options for exchange.

[e]The cancellation date for options tendered is the date firms cancel properly tendered options and is usually the same date as the expiration date or shortly thereafter (e.g. the next business day).

[f]The waiting period is the six month period between the cancellation date and the replacement date.

[g]The replacement option grant date is the date that replacement (new) options are granted to participants. The replacement option grant date must be greater than six months from the cancellation date and is usually six months and one day from the cancellation date.

In *Panel B* of Table 1 I further divide the immediate repricings into the type of securities used to replace tendered options. The traditional immediate stock option repricing accounts for only 8.0 percent of all repricings. Other types of replacement securities used in exchange offers include restricted stocks (10.5%) and immediate stock (0.5%). FASB FIN 44 considers stocks used as replacement securities in repricings as options with an exercise price equal to zero.

To examine the return performance of the repricing sample surrounding the filing date, I compute the average buy-and-hold return for the repricing sample from months -36 to +12 relative to the filing month. A similar computation is made for the NYSE/AMEX/NASDAQ value- and equally-weighted indices.

The results in Figure 2 show that the repricing firms outperform the overall market in months -36 to -15, but underperform the market in months -14 to -1.

Table 1

This table presents the types of stock option repricings filed electronically with the SEC by firms during the sample period beginning with the first firm to file in December 2000 and ending December 31, 2001.

Type	Number	Percentage	Accounting Charge[d]
(a) Stock option repricing grouped by nature of exercise price setting.			
Delay[a]	131	81.0%	No
Immediate[b]	31	19.0%	Yes
Total	162	100.0%	
(b) Breakdown of delay and immediate stock option repricings by financial instrument received for options tendered.			
Delay option	131	81.0%	No
Immediate option	13	8.0%	Yes
Restricted stock[c]	17	10.5%	Yes
Stock	1	0.5%	Yes
Total	162	100.0%	

[a] Delay option repricings result in an unknown exercise price of replacement options at the time when participants tender eligible options for exchange.

[b] Immediate option repricings result in a known exercise price of replacement options at the time when participants tender eligible options for exchange.

[c] Restricted stock and stock result in a known exercise price at the time when participants tender eligible options for exchange. The granting of stock can be viewed as an option with an exercise price equal to zero.

[d] When a firm chooses to use delay option repricing, it can avoid charging granted options as expenses against revenues.

Non-Repricing Sample

In my matching procedure I control for industry, one-year prior performance, size, and underwater options. I construct a non-repricing control sample of 162 firms using a four-step matching procedure.

In the first step each repricing firm in the repricing sample is matched with all firms in the same 2-digit SIC code that have a share code in CRSP equal to 11. The share code restriction excludes matching on American Depository Receipts (ADRs), closed-end mutual funds, Primes and Scores, and REIT's. In the second step, I select non-repricing firms with one-year prior holding period returns (from months -12 to -1) that are within +/- 5% of the repricing firm's one-year prior holding period return. If no match is found within +/- 5%, the range is increased to +/- 10%. Finally, if no match is found at +/-10%, then the non-repricing firm that has the closest one-year prior return is selected. In the third step, I select non-repricing firms based on market capitalization closest to that of repricing firms in the prior month[4]. Finally, the non-repricing firm is further scrutinized for underwater options using the non-repricing firm's option information contained in the last proxy statement before the filing date and its closing stock price on the filing date. If the non-repricing firm has underwater options, then it enters the sample. In the event it does not have underwater options, it is replaced with the next best match and the step is repeated[5].

Figure 2

Average buy-and-hold returns (decimal) for the test sample of 162 repricing firms and the CRSP value- and equally-weighted indices. Month zero is the month in which firms file their repricing with the SEC.

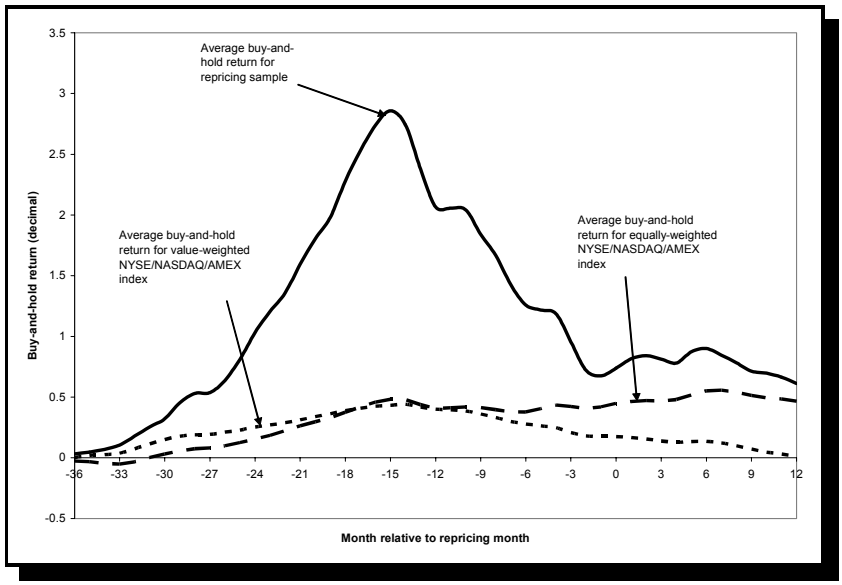
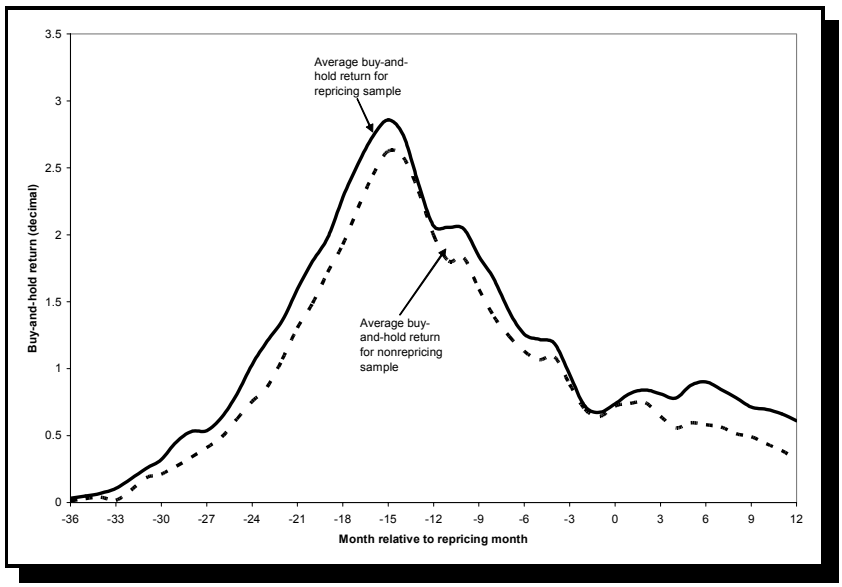


Figure 3

Average buy-and-hold returns (decimal) for the test sample of 162 repricing firms and control sample of 162 non-repricing firms matched on 2-digit SIC code, one-year prior returns, market capitalization, and the existence of underwater options. Month zero is the month in which firms file their repricing with the SEC.



In Figure 3 I present the average buy-and-hold return for the repricing and non-repricing firms for the months -36 to +12 surrounding the repricing filing month. The return pattern across the two groups is similar. However, the repricing firms perform slightly better than the non-repricing firms during the months -36 to -15, with average buy-and-hold returns of 285% and 262%, respectively. Also, repricing firms perform about the same as non-repricing firms during the months -12 to -1 with buy-and-hold returns of -62.7% and -62.2%, respectively. It also appears that repricing successfully restores managerial and employee incentives. The repricing firms significantly outperform the non-repricing firms subsequent to the filing date, from months +1 to +12, with average buy-and-hold returns of -7% and -23%, respectively.

In Table 2 I present descriptive statistics for variables that proxy for incentive realignment and agency problems for the repricing and non-repricing firms. I present the test of these variables as follows:

Incentive Realignment Variables

Underwater options

I compute three measures of underwater options: (*i*) degree options underwater, (*ii*) % of options underwater, and (*iii*) value loss of underwater options, that proxy for the need to realign incentives. I compute the degree options underwater as: (weighted average exercise price of underwater options – market price of stock on event date) divided by the weighted average exercise price of underwater options. The information used to estimate the weighted average exercise price of underwater options and number of underwater options is taken from the last proxy statement before the SEC tender offer filing date. To compute the percentage of options underwater, I divide the number of underwater options by the total number of options outstanding. Finally, I compute the value loss of underwater options as: number of options underwater multiplied by (market price of stock on the repricing date – weighted average exercise price of underwater options).

If repricing proponents are correct, then repricing firms will have a greater need to realign incentives than non-repricing firms. Therefore, I expect the sign of the differences for these three measures of underwater options to be positive. The mean difference in the degree options underwater (7.1%), % options underwater (6.8%), and value loss of underwater options ($153.6 million) between repricing and non-repricing firms are all statistically significant at the 1% level.

Growth opportunities

I measure growth opportunities as the market value of assets to book value of total assets. The market value of assets is the sum of the market value of equity and the book value of debt. All items are taken from Compustat for the last fiscal year before the filing date, except market value of equity, which is computed from CRSP as the number of shares outstanding times the market price of stock one month before the filing date.

Firms that have lower growth rates tend to have a stronger incentive to reprice their options in order to increase their growth rate. Therefore, I anticipate that repricing firms tend to be associated with lower market to book value. The mean market value to book value of total assets for the repricing sample is 1.05,

compared to the mean of 1.31 for the non-repricing sample. The mean difference is significant at the 5% level.

Firm age

I compute firm age from the repricing announcement date to the first date that firms have return information reported on CRSP. Chidambaran and Prabhala (2000) argue that younger firms are less likely to have well developed lines of succession, thus employee turnover is likely to be more costly for younger firms. If employee retention is a motive for repricing, then I expect that younger firms will be more likely to reprice options. The repricing and non-repricing firms are both young (less than six years) and they are not significantly different from each other.

Volatility

I compute the standard deviation of daily returns during the year prior to the SEC filing and use it as a measure of volatility. Since the value of options is an increasing function of stock price volatility, as the stock price volatility decreases, the option value decreases and this can result in an increased need for firms to realign incentives by repricing options. Therefore, I expect the stock prices for repricing firms to be less volatile. The difference in volatility between repricing and non-repricing firms, however, is not significant.

Agency Variables

Ownership structure

I compute three measures of ownership structure: (*i*) % of shares owned by insiders, (*ii*) % of shares owned by large outsiders (5% or more), and (*iii*) % of shares owned by CEO. I obtain the data from the last proxy statement before the SEC filing date. The percent of shares owned by large outside owners (5% or more) is the sum of all non-executive and non-director large owners (5% or more) as reported in the last proxy statement before the SEC filing date. Shleifer and Vishney (1997) show that large outside investors serve as a corporate governance mechanism. According to Bebchuk, Fried, and Walker (2002), and Bebchuk and Fried (2004), insider-managers -- especially insider-managers who own larger percentage of stocks tend to have greater power to influence company decisions including option repricings to benefit themselves. Therefore, I expect that repricing will be associated with higher CEO and insider ownership of stocks and less large outside ownership. The findings in this paper indicate that insider and the CEO stock ownerships for repricing firms are both significantly *lower* than the non-repricing firms. The results do not support repricing opponents' argument.

Table 2

This table presents descriptive statistics for the 162 repricing firms and a control group of 162 non-repricing firms, matched by two-digit SIC codes, one-year prior returns, market capitalizations, and underwater options. I measure all variables relative to the SEC filing date. For accounting information obtained from Compustat, I use annual data for the last fiscal year before the SEC filing date. For return information obtained from CRSP, I use the monthly stock file to compute returns and the daily stock file to compute volatility. I use the last 10-K or proxy before the filing date to obtain shareholder information. The information for each non-repricing firm is based on the filing date for the corresponding repricing firm. The difference in means is examined using the parametric match pair t-test. The difference in proportions is examined using a two sample test for proportions.

Variable	Repricing	Non-repricing	Difference between Repricing and Non-repricing
Incentive Realignment Variables			
Degree options underwater	68.8%	61.7%	7.1%***
% options underwater	75.9%	69.1%	6.8%***
Value loss of underwater options ($ millions)	257.9	104.3	153.6***
Market/Book	1.05	1.31	-0.26**
Firm age (years)	5.45	5.96	-0.51
Volatility	7.78%	7.59%	0.19%
Agency Variables			
% insider owned	23.7%	28.8%	-5.1%**
% oustide 5% owned	24.1%	21.6%	2.5%
% CEO owned	7.1%	12.0%	-4.9%***
% insiders on board	21.9%	23.3%	-1.4%
CEO chairman	55.6%	68.5%	-12.9%**
Executive on comp committee	8.1%	9.8%	-1.7%
Total assets ($ millions)	1837.0	766.4	1070.6**
Total sales ($ millions)	830.6	380.9	449.7**
*,**,*** Denote significance at the 10%, 5%, and 1% level, respectively.			

Board

I compute three board measurements: (*i*) % insiders on board, (*ii*) CEO chairman, and (*iii*) executive on compensation committee. I compute the percent insiders on board as the number of executives on the board of directors divided by the total number of directors, CEO chairman is a dummy variable equal to 1

if the CEO is the chairman of the board and 0 otherwise; and executive on compensation committee is a dummy variable equal to 1 if an executive is on the compensation committee and 0 otherwise.

Based on the arguments of Bebchuk, Fried, and Walker (2002), and Bebchuk and Fried (2004), repricing firms tend to have: (*i*) the CEO as the board chairman, (*ii*) an executive on the compensation committee, and (*iii*) insiders on the board of directors. The results in my paper, however, show that repricing firms have a lower percentage of insiders on the board, a significantly lower proportion of CEOs as the chairman of the board, and a lower proportion of executives on the compensation committee. Once again, the results in my study are in line with the argument of reprincing proponents.

Firm size

I use two measures of firm size, total assets and total sales, as reported in Compustat for the last fiscal year before the filing date. Studies have shown that large firms are more scrutinized by the financial press, and more closely followed by analysts (e.g. Moyer, Chatfield, and Sisneros, (1989)) and therefore are less likely to reprice options if the market associates repricings with greater agency problems. In addition, studies have shown that a transfer of wealth to managers might be easier for small firms due to weaker governance mechanisms or less outside scrutiny (e.g. Carter and Lynch (2001)). Therefore, I expect the repricing firms to be smaller than non-repricing firms. The repricing firms, however, are significantly larger in size than the non-repricing firms. The total assets and total sales for repricing firms are $1,837 million and $830 million respectively and both are larger than those for non-repricing firms – $766 million and $380 million respectively. The results are again in favor of the repricing proponents' argument.

METHODOLOGY

Why Do Firms Reprice Their Options?

I investigate whether the decision to reprice options is associated with firm-specific performance by examining prior stock price performance. I compute the one-year prior holding period return for each repricing sample firm minus the one-year prior holding period return for the equally- and value-weighted indices. I use a similar computation for all firms in the same 2-, 3- and 4-digit SIC code, excluding the repricing sample. By subtracting market returns from repricing firm returns, only an industry effect remains. Likewise, by using a stepwise procedure of subtracting 2-, 3-, and 4-digit SIC code returns from repricing firm returns, I eliminate the industry component associated with the repricing firm's prior stock price performance at each SIC code level. Next, I estimate logistic regressions to examine whether the decision to reprice options is associated with a greater need to realign incentives or greater agency problems.

Does Option Repricing Realign Incentives?

I use an event study method suggested by Barber and Lyons (1997) to compute short-term and long-term buy-and-hold abnormal returns using my test sample of repricing firms and control sample of non-repricing firms.

EMPIRICAL RESULTS

Stock Price Performance Surrounding the SEC Filing

In Table 3 I present the results of the stock price performance for repricing firms. These firms significantly underperform every comparison group. Significant firm-specific returns remain at the 1% level. Nonetheless, the mean firm-specific component of prior poor performance decreases significantly from -59.5% with the equally-weighted NYSE/AMEX/NASDAQ index to -27.6% with the 4-digit SIC code industry return. At the 4-digit SIC code over 56% of the prior poor performance of repricing firms can be attributed to an industry effect[6]. This suggests that an industry component might explain a significant proportion of the prior poor performance.

Table 3

This table presents univariate results of the one-year prior stock price performance for the repricing sample. I compute firm-specific one-year prior stock price performance as the one-year prior buy-and-hold return of the repricing firm minus the one-year prior buy-and-hold return for the NYSE/AMEX/NASDAQ index. A similar computation is made for all firms that match at the 2-, 3-, and 4-digit SIC code, excluding the repricing sample. I measure all one-year prior buy-and-hold returns using the CRSP monthly stock file from month -1 to -12, where month 0 is the filing month. I examine the difference in means using the parametric match pair t-test.

Variable	Repricing Sample Return	Index/SIC Return	Paired difference (test-index/SIC)
Repricing sample return minus equally weighted return	-62.7%	-3.2%	-59.5%***
Repricing sample return minus value weighted return	-62.7%	-18.0%	-44.7%***
Repricing sample return minus SIC 2 industry return	-62.7%	-30.3%	-32.4%***
Repricing sample return minus SIC 3 industry return	-62.7%	-34.5%	-28.2%***
Repricing sample return minus SIC 4 industry return	-62.7%	-35.1%	-27.6%***
*,**,*** Denote significance at the 10%, 5%, and 1% level, respectively.			

To investigate this further, I estimate the following cross-sectional regression equation:

$$OOM_j = b_0 + b_1 R^{industry}_{-12,-1,j} + b_2 R^{firm-specific}_{-12,-1,j} + e_j \quad (1)$$

where OOMj is the degree options are out-of-the-money for firm j, $R^{industry}_{-12,-1,j}$ is the one-year prior compound return on the 2-digit SIC code industry for firm j, excluding the repricing firms and $R^{firm-specific}_{-12,-1,j}$ is the one-year prior compound return on firm j minus the average one-year prior compound return on the 2-digit SIC code industry, excluding the repricing firms, for firm j. Both

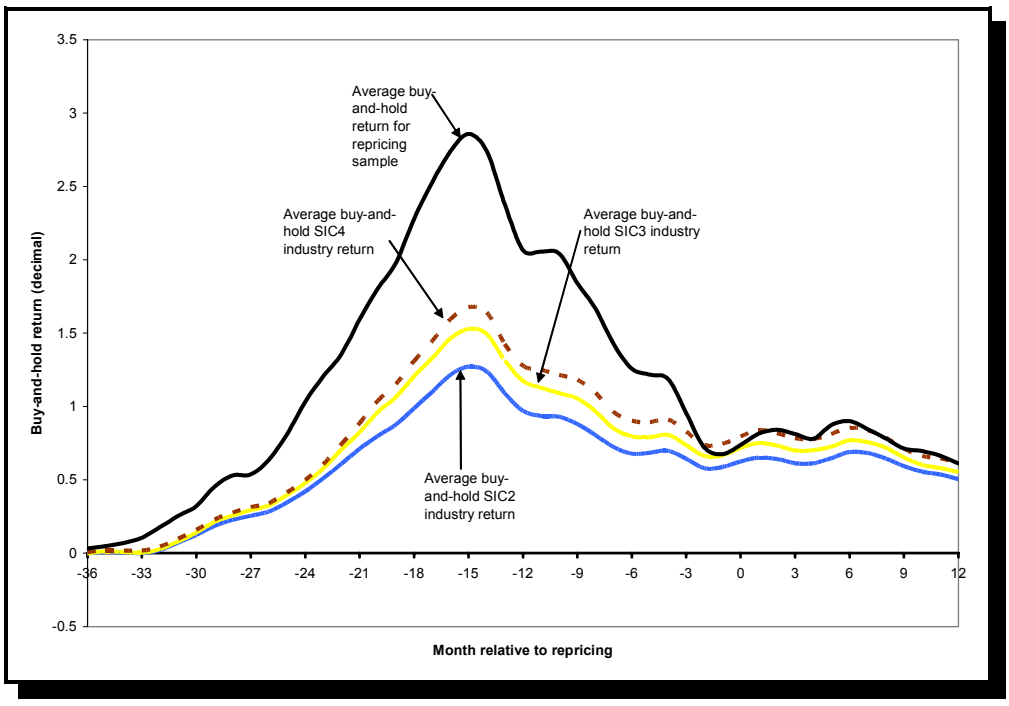
$R^{industry}_{-12,-1,j}$ and $R^{firm-specific}_{-12,-1,j}$ are statistically significant at the 1% level. The parameter estimates for

$R^{industry}_{-12,-1,j}$ and $R^{firm-specific}_{-12,-1,j}$ are -0.3083 and -0.4357, respectively. The results suggest that repricings are driven by industry and firm-specific factors.

In Figure 4 I present the average buy-and-hold returns for repricing firms, in relation to their 2-, 3-, and 4-digit SIC code industry returns, excluding the repricing firms, from month -36 to +12. From month -36 to -14 repricing firms and all SIC code industry levels experience an increasing stock price and repricing firms outperform their 2-, 3-, and 4-digit SIC code industries. From month -14 to month -1, however, the stock price for both repricing firms and all three industry classifications decline and the stock price for repricing firms decline at a steeper rate than the industry. Therefore the repricing can be attributed to both the stock price decline of the entire industry (which is beyond the control of repricing firms) and the stock price decline of the repricing firms.

Figure 4

Average buy-and-hold returns (decimal) for the repricing sample of 162 firms and all firms that match at the 2-, 3-, or 4-digit SIC code, excluding repricing firms. Month zero is the month in which firms file their repricing with the SEC.



Why Do Firms Reprice Their Options?

In Table 4 I present the results of the logistic regressions on all repricing firms. Since degree options underwater and percent options underwater are similar measures, I chose degree options underwater[7]. I also make a similar choice between percent insider owned and percent CEO owned by choosing percent CEO owned. Finally, I use the logarithm of sales as the size measure[8].

In Model 1, the degree options underwater is significant at the 5% level. This is consistent with the repricing proponents' argument that repricing firms have a greater need to realign incentives. The results show that market value to book value, firm age, and stock return volatility are not statistically significant.

Table 4

This table presents the results of logistic regressions for 162 repricing firms and a control group of 162 non-repricing firms, matched based on the existence of underwater options, 2-digit SIC code, one-year prior return, and total market capitalization. The dependent variable is equal to 1 if the firm reprices its options and 0 otherwise. All measures for the repricing firms are taken relative to the SEC filing date and all measures for the non-repricing firms are taken by the SEC filing date of their corresponding repricing firms. Parameter estimates are given in the Table. Definitions are given in Table 4.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.516	-0.633	-0.829	-0.848*	-2.299***
Incentive Realignment Variables					
Degree Options underwater	1.747**	1.193**			1.665***
MKT/BK	-0.088	-0.121			-0.057
Firm age	0.003				
Volatility	-6.969				
Agency Variables					
% outside 5% owned			0.167		
% CEO owned			-2.129**	-2.147**	-1.929*
% insiders on board			0.391	0.370	0.658
CEO chairman			-0.531**	-0.532**	-0.548**
Executive on comp. committee			-0.071		
log(sales)			0.161**	0.161**	0.232**
Model Information					
Sample size	324	324	324	324	324
Rescaled R-square	0.044	0.039	0.070	0.071	0.114
Likelihood Ratio (p-value)	0.036	0.010	0.010	0.002	0.000

*,**,*** Denote significance at the 10%, 5%, and 1% level, respectively.

In Model 2 the same incentive realignment variables remain significant[9]. In Model 3 the percent of shares owned by CEOs, CEO chairman, and size (measured by the logarithm of sales) are all significant at the 5% level and they are not consistent with the repricing opponents' argument. Firms with a lower percentage CEO ownership of shares and firms where CEOs are not the chairman of the board are more likely to reprice options. The latter result is surprising since repricings are a board decision. According to the repricing opponents' agency argument, repricings should be more likely when the CEO is the chairman. The size result does not support the opponents' argument in the literature (Brennar, Sundaram, and Yermack, 2000; Chance, Kumar, and Todd, 2000; and Carter and Lynch, 2001) that repricing firms tend to be smaller than non-repricing firms. In Model 4 the same agency variables remain significant[10].

The results for Model 5 are consistent with the argument that repricing firms have a greater need to realign incentives. The degree options underwater is significant at the 1% level. This result is consistent with Carter and Lynch (2001). Moreover, the results for the variables related to agency problems do not suggest that repricing firms have weaker internal governance. In this model, a 10% increase in the degree options underwater increases the probability of repricing by 4% and if the CEO is the board chairman, then the probability of repricing decreases by 15.7%.

Does Repricing Realign Incentives?

In Table 5 I present abnormal stock returns for repricing firms surrounding the SEC filing date. In all cases, repricings are not associated with any abnormal returns surrounding the filing date.

Table 5

This table presents the abnormal returns surrounding the SEC filing day (day 0 is the filing day). The abnormal returns are calculated by subtracting the buy-and-hold return of the non-repricing firms from the buy-and-hold return of the repricing firms during the window periods. Repricing firms are matched with non-repricing firms based on the existence of underwater options, 2-digit SIC code, one-year prior return, and total market capitalization. I use the cross-sectional standard deviation of the abnormal returns for the window periods to compute t-statistics.

Window	All Repricings	Immediate Repricing	Delayed Repricing
[0,+1]	0.28%	1.15%	0.07%
[0,+90]	4.72%	8.17%	3.89%
[0,+180]	10.46%*	3.99%	12.01%*
[0,+270]	9.79%**	1.54%	11.76%**
[0,+360]	11.83%**	1.13%	14.38%**
Waiting Period for Delay Options+			
[-120,0]	N/A	N/A	11.19%*

+: Day 0 is the replacement day for the delayed repricing.

*,**,*** Denote significance at the 10%, 5%, and 1% level, respectively.

Also in Table 5 I present the results of the post-repricing long-term stock price performance. Repricing firms have a positive abnormal return of 4.72% three months after the filing date. At six months repricing firms have a significant positive abnormal return of 10.46%. The performance of repricing firms continues to improve over longer intervals. At 12 months, the abnormal return is 11.83% and is significant at the 5% level. The results show that option repricing realigns employees' and executives' incencives and improves firms' long-term performance. The results in Table 5 also show that both immediate and delay repricings are associated with positive long-term abnormal returns. The long-term stock price performance is greater for delay repricings.

ROBUSTNESS TEST

Temporary perverse incentive effect

Repricing opponents argue that delay repricings create an additional temporary perverse incentive. Since the exercise prices in delay repricings are set based on stock prices on the replacement dates, which is in the future, participants have an incentive to allow further declines in the stock price during the six-month period between the cancellation date of the tendered options and the replacement date of the new options by delaying value-enhancing activities and/or by releasing bad (good) information prior (subsequent) to the granting of replacement options. The opponents' argument is supported by Yermack (1997), and Aboody and Kasznik (2000) who find that the timing of CEO stock options is associated with favorable movements in stock prices. The study of Yermack (1997) concludes that CEOs receive stock options before good news, and the study of Aboody and Kasznik (2000) reports evidence that CEOs behave opportunistically surrounding their option grant dates by rushing the release of bad news and delaying the issue of good news. More importantly, the temporary perverse incentive potentially caused by delay repricing is of great concern to the general investment community (*WSJ*, June 4, 2001, p. C1; and *WSJ*, April 15, 2002, p. C1) and to repricing firms as illustrated by the statement from Avici Systems regarding its repricing announced on October 10, 2001:

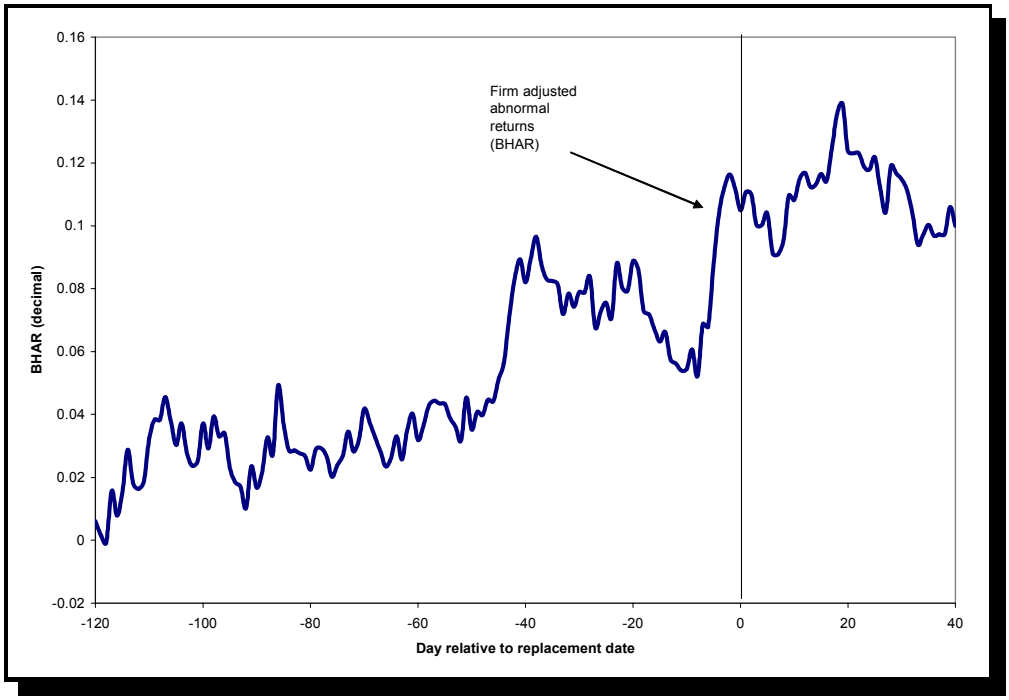
> *"...we have decided to grant restricted stock as part of the offer in order to provide our employees with the benefit of immediate equity ownership in our company, and thereby create better performance and retention incentives for employees during the time period between the date tendered options are accepted and cancelled and the grant date of the new options."*

To investigate the potential temporary perverse incentive I ask the following question: Do delay option repricing firms underperform during the six months and one day waiting period? I use a control firm event study method similar to Barber and Lyon (1997) using my control sample of non-repricing firms to compute abnormal returns. The results are presented in the last line of Table 5.

The buy-and-hold average abnormal return during the waiting period is 11.19% and is significant at the 10% level[11]. This result does not support the opponents' argument and is consistent with the previous findings that repricing firms are associated with reduced manager-owner conflicts of interest. Moreover, the

results in Table 5 show that the ex-post long-term performance of repricing firms is not lower as a result of the temporary perverse incentive.

Figure 5 illustrates the pattern of daily buy-and-hold abnormal returns surrounding the replacement date (day 0). Improvement in stock price performance begins shortly after repricing firms file their delay option repricings with the SEC, continues over the period, and rises sharply just before the replacement date. Finally, performance up to eight weeks after the replacement date is relatively flat. In sum, this pattern of significant positive abnormal returns before options are granted, and relatively flat performance afterward, does not suggest agency problems documented by Yermack (1997) and Aboody and Kasznik (2000).



As a check of the stock price performance during the temporary perverse incentive period, I compute the paired difference in earnings changes between the repricing and non-repricing firms for the last two quarters before the replacement date. If delay repricing firms are acting on the temporary perverse incentive, then I expect delay repricing firms to have lower changes in earnings than their corresponding matched non-repricing firms. The results are presented in Table 6.

In Table 6 quarter-to-quarter and year-to-year changes in earnings are computed for diluted EPS including extraordinary items and basic EPS including extraordinary items. Diluted EPS including extraordinary items is Compustat quarterly data 7 item and basic EPS including extraordinary items is Compustat quarterly data item 11. I compute quarter-to-quarter changes in earnings as the earnings in one quarter minus the earnings in the previous quarter and year-to-year changes in earnings as the earnings in one quarter minus the earnings in the same quarter one year ago. Quarter *t=0* is the quarter that contains the replacement option grant date. I use Compustat quarterly EPS data items that include extraordinary items

to better capture attempts by firms to decrease earnings prior to the replacement date. In all cases the paired differences in earnings changes between repricing and non-repricing firms are not statistically significant. The repricing sample does not have lower changes in earnings during the last two quarters before the replacement date. The results in Table 6 support the stock price performance results in Table 5.

Table 6

This table presents the paired differences in earnings changes between the 131 delay repricing and 131 matched non-repricing firms for the last two quarters before the replacement date. Quarter-to-quarter changes in earnings are computed as the earnings in one quarter minus the earnings in the previous quarter. Year-to-year changes in earnings are computed as the earnings in one quarter minus the earnings in the same quarter one year ago. Quarter t=0 is the quarter that contains the replacement option grant date. Diluted EPS including extraordinary items is Compustat quarterly data 7 and basic EPS including extraordinary items is Compustat quarterly data 11. I use the parametric matched pair t-test to investigate the differences in means.

	quarter-to-quarter changes		year-to-year changes	
Variable	$quarter_{-2}$	$quarter_{-1}$	$quarter_{-2}$	$quarter_{-1}$
(a) Diluted EPS				
EPS including extraordinary items	0.08	-0.46	-0.00	-0.34
(b) Basic EPS				
EPS including extraordinary items	0.08	-0.46	-0.00	-0.34
*,**,*** Denote significance at the 10%, 5%, and 1% level, respectively				

CONCLUSION

The decision to reprice stock options is a highly debated and much publicized corporate event. In this paper I find that repricings are associated with both poor industry and poor firm-specific performance prior to the repricing. Also, in examining the decision to reprice, I find that the likelihood to reprice options increases as the degree options underwater increases. More importantly, I find no evidence supporting the idea that repricing firms are associated with greater agency problems. This highlights an apparent trend in the repricing literature. Studies examining option repricing during periods when stock markets are going up find that repricing firms are associated with either greater agency problems or are not associated with agency problems [12,13]. Using a sample of repricing firms in 2001 when stock markets are declining, I find that repricing firms are associated with reduced manager-owner conflicts of interest.

Option repricing realigns incentives. Although repricings are not associated with any abnormal returns surrounding the filing date, repricing firms do experience significant positive long-term abnormal returns after repricing. This result supports the repricing proponents' argument that repricing realigns employees' and executives' incentives. Finally, I find no evidence supporting the temporary perverse incentive. Delay repricings are associated with significant positive abnormal returns over this period.

ENDNOTES

[1] The rule is 13e-4(f)(1)(i), *Manner of Making Tender Offer, Tender Offers by Issuers.*

[2] Technically, FASB FIN 44 states that participants are only required to tender for exchange all options received during the look-back period with an exercise price lower than the exercise price of any other options being tendered. However, in practice firms filing delay stock option exchange offers on tender offer statements with the SEC generally require participants to tender all options granted during the six-month look-back period, regardless of the exercise price of the option granted during the look-back period.

[3] Technically, FASB FIN 44 states that participants are only required to tender for exchange all options received during the look-back period with an exercise price lower than the exercise price of any other options being tendered. However, in practice firms filing delay stock option exchange offers on tender offer statements with the SEC generally require participants to tender all options granted during the six-month look-back period, regardless of the exercise price of the option granted during the look-back period.

[4] The match based on the closest market capitalization between non-repricing and repricing firms still results in significantly larger size as measured by total assets and total sales for repricing firms, as shown in Table 2. The larger size of repricing firms is in favor of the repricing proponents' argument.

[5] A necessary condition for a non-repricing firm to be included in the control group is that the non-repricing firm must have underwater options, but chooses not to reprice.

[6] This measure is calculated by taking the average one-year prior 4-digit SIC code industry return and dividing by the average one-year prior return for the repricing sample

[7] Carter and Lynch (2001), and Chidambaran and Prabhala (2002) also use this measure.

[8] Chance, Kumar, and Todd (2000); Chidambaran and Prabhala (2002); and Brenner, Sundaram, and Yermack (2000) also use this measure.

[9] I use principal components to reduce the number of variables in Model 2. In Model 2 over 75% of the total variance is explained by the first two principal components and the variables that load are degree options underwater and market value to book value.

[10] I use principal components to reduce the number of variables in Model 4. In Model 4 over 81% of the total variance is explained by the first three principal components and the variables that load are percentage of shares owned by CEOs, percent of insiders on board, and sales.

[11] A market model event study produces even more positive significant abnormal returns. Barber and Lyon (1997) show that the market model is misspecified when computing long-term abnormal returns.

[12] Chance, Kumar, and Todd (2000) use a sample period from 1985 to 1994. Brenner, Sundaram, and Yermack (2000) use a sample period from 1992 to 1995. Both papers find evidence of greater agency problems in repricing firms.

[13] Carter and Lynch (2001) use a sample period from 1998. Chidambaran and Prabhala (2002) use a sample period from 1992 to 1997. Both papers find no evidence of a relation between agency problems and the decision to reprice options.

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EFFECTS OF CORPORATE GOVERNANCE AND BOARD EQUITY OWNERSHIP ON EARNINGS QUALITY

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ABSTRACT

Evidence suggests that insiders can overcome monitoring mechanisms and report low quality earnings, even for firms meeting new legislative and exchange governance standards. We test the "entrenchment" hypothesis by examining relative and absolute board member ownership in relation to earnings quality. We apply the Dechow and Dichev (2002) model of earnings quality to public corporations in the year 2002 because the effects of the Sarbanes-Oxley Act were not yet fully reflected. We find evidence that supports the "entrenchment" hypothesis and contradicts the uniform "convergence-of-interests" theory. We identify entrenchment thresholds where earnings quality is directly affected by entrenched board members that could result not just from intentional manipulation, but also shirking or incompetence. We also show that board members, whether independent or affiliated with management, can become entrenched. Although earnings quality is negatively correlated with insider ownership for entrenched firms, we show that entrenchment can be moderated by governance structures. Our findings support a favorable governance environment comprised of multiple governance factors as opposed to single controls, which justifies the attention being paid to composite corporate governance in research and by commercial enterprises.

INTRODUCTION

Earnings quality is critical to the efficient allocation of resources in capital markets. Reports of earnings that do not reflect the underlying economic performance of a firm inflicts losses on individual investors, employees, other companies, and the economy as a whole. The General Accounting Office, the investigative office for Congress, reports that earnings restatements rose approximately 145 percent from 1997 through June of 2002. During that period, approximately 10 percent of all listed companies announced an accounting correction or restatement costing investors approximately $100 billion in market capitalization (Wells 2002).

One of the most important functions of corporate governance is to ensure the quality of the financial reporting process. The Sarbanes-Oxley Act of 2002 and the major stock exchanges now

require boards to have a majority of outside directors and audit committees to have three independent directors. The intent is to limit the ability of management to engage in opportunistic behavior by increasing the ability of both the board and the audit committee to monitor management. The intended outcome is to restore investor confidence in the quality of reported earnings.

However, evidence suggests that management can overcome monitoring mechanisms, even those that meet the new legislative and exchange standards. *Chief Executive* Magazine (Niskanen 2003) reports that all major firms charged with accounting scandals through 2002 were in full compliance with the standards for board and audit committee independence now required by the Sarbanes-Oxley Act. This implies that monitoring by independent directors is not always sufficient and/or effective in controlling management malfeasance.

There is clearly a need for further research to explore why corporate governance monitoring mechanisms are less effective in some cases. One possible reason is that board members become entrenched. Board members are in agency relationship with owners to monitor management behavior. Entrenchment occurs when a manager (or other party in an agency relationship), has enough firm equity, influence, or power to overcome governance constraints on their behavior (Fama and Jensen, 1983). When this occurs, insiders gain effective control and are able to engage in non-value-maximizing behavior. Effective control can occur through structural and ownership power (Dunn, 200), and from weak oversight by the board (Beasley, 1996; Dechow, Sloan, and Sweeney, 1996), attributed to lack of incentives for board members to monitor management.

In this study, we examine the incentive and power effects of the equity ownership of board groups (independent and insider board members) on the earnings quality of publicly traded companies for the year 2002. The year 2002 is selected because wide-scale accumulation of governance data is not available prior to 2002 and the effects of the Sarbanes-Oxley Act are not fully reflected until after that year. We examine the effect of governance and combined effects of governance and equity ownership to determine if entrenched board members allow management to overcome governance constraints resulting in lower earnings quality.

Earnings quality refers to persistence of earnings, i.e., its ability to forecast future earnings. Prior research has shown that accruals are better estimates of future earnings than cash flows (Sloan, 1996; Dechow et. al. 2002) and that the *accuracy* of the accruals is more explanatory than the size or level of accruals. An accurate accrual equals its related cash flow indicating that no errors in estimates occurred, i.e., earnings quality is perfect.

While many earnings quality studies focus on the size or discretionary nature of accruals to measure intentional manipulation of earnings, we define the quality of earnings by measuring accrual estimation errors, which we use as a proxy for earnings quality (Dechow and Dichev, 2002). We choose this approach because it does not differentiate between errors and irregularities in accruals and does not rest on the assumption that accrual errors only occur because of intentional manipulation. Accrual quality is related to firm and industry characteristics, which are observable, and can result from management incompetence, shirking, and/or honest estimation errors. Effective

oversight by board members should influence management and result in a reduction of the size and incidence of estimation errors resulting in higher earnings quality.

We examine earnings quality in relation to the proportionate ownership of board insiders to total board equity, consistent with Dechow, Sloan, and Sweeney (1996), and more recently, Dunn (2004). While many entrenchment studies have measured insider ownership of total equity to assess insiders' incentives, we wished to measure both the power and incentive of the board groups. We measure power through the proportionate ownership of the board groups to total board equity; consistent with prior research studies, we measure incentive as the total ownership of each board group to total equity. These measures allow us to assess the power of each board group across different ownership levels, in addition to each group's incentive to protect shareholders' interests.

The major contributions of this paper can be summarized as follows.

1. We find strong evidence to support the entrenchment hypothesis as opposed to the uniformity proposed under the convergence of interest theory.
2. We use a relatively new measure of earnings quality to test for evidence of entrenchment (Dechow and Dichev, 2002). This approach allows us to provide evidence of entrenchment related to earnings quality, not just extreme forms of earnings management such as fraud.
3. We find that both inside management serving on the board and independent board members can become entrenched.
4. We find governance mechanisms can be effective to control management behavior.
5. We also find evidence that, for firms experiencing entrenchment, the strength of governance mechanisms is reduced but still effective enough to reduce the impact of entrenchment on earnings quality.

In summary, the incidence of earnings restatements in firms that were in compliance with recent governance reforms implies that there are factors present that allow management to overcome governance constraints and continue to report low quality earnings. Although we find that both independent and insider board members became entrenched, we also find that effective governance moderates the negative effect of entrenchment on earnings quality.

THEORETICAL BASES AND HYPOTHESIS DEVELOPMENT

Recent financial scandals have raised the issue of whether public companies are being run in the best interests of the shareholders. Management may have too much power and not enough supervision and accountability, particularly in companies with widely dispersed ownership. Agency conflicts, conflicts that arise from the separation of ownership and control, may not be effectively resolved through corporate governance systems. Corporate governance is a set of mechanisms put

in place by stakeholders to exercise control over management. The way in which these mechanisms are set up and fulfill their role defines the governance structure of the firm (Farinha, 2003).

Agency theory discusses the types of monitoring and bonding costs that can be employed to reduce agency conflicts. According to Fama and Jensen (1983), the most critical monitoring mechanism is that of the board of directors. The board is charged with monitoring the decisions and actions of management to ensure that management acts in the best interest of shareholders. It is important for the board to have both inside and outside directors as each brings different qualifications and motivations to the table. However, there is clear evidence that board independence results in more effective monitoring of management, particularly with respect to the board's ability to monitor the earnings process.

The assertion is that a board's relative independence from management is negatively related to earnings manipulation. Klein (2002a) found a negative association between a firm's discretionary accruals (proxy for earnings management) and the percent of outside directors on the board. Klein also found that as boards became more independent by changing the board composition, the level of discretionary accruals declined. Xie, Davidson III, and DaDalt (2003) found evidence that more independent boards were associated with lower levels of discretionary current accruals.

In fraud studies, researchers found that firms with higher levels of independent directors were less likely to commit fraud (Beasley, Carcello, Hermanson, and Lapides, 2000; Beasley, 1996) In addition to the number of independent directors, Beasley (1996) also found that as total levels of stock ownership by outside or independent board members increased, the likelihood of fraud decreased. This suggests that board structure *and* stock ownership of the board have an impact on the board's monitoring effectiveness.

Increased ownership by independent board members may provide more incentive for monitoring but may also imply that ownership affects the power of the board to monitor management. An alternative interpretation of Beasley's findings may have to do with the relative power of the two board groups, insiders and independents, over each other, though this was not measured in Beasley's study. Other studies, discussed in the following paragraphs, have measured the proportionate ownership of board groups as a proxy for power.

Dechow, Sloan, and Sweeney (1996) used a proportionate measure of managerial ownership (defined as number of shares of stock owned by officers on the board) as a proportion of total board member ownership in their analysis of firms subject to SEC enforcement action. Like Beasley (1996), they found that earnings management was less likely to occur if outside or independent directors dominated the board. However, they found that low oversight by the board was the predominant variable impacting the likelihood of earnings management. They also found that for firms subject to SEC enforcement action, insiders held a significantly greater proportion of total board equity relative to outsider board members. This implies that even though insiders were not dominant in terms of numbers of board members, they may have been able to dominate independent board members through increased ownership. An alternative interpretation could be that independent board members did not own enough stock to align their interests with owners. This

interpretation is consistent with Beasley's finding that increased ownership by independent board members reduced the likelihood of fraud.

These findings suggest that weak monitoring is a catalyst for earnings management and that there is a greater likelihood of earnings management if management can dominate the board, through greater numbers of directors or higher stock ownership percentages, relative to independent board members. Recent legislative reform has addressed the proportion of board members that can be insiders. The legislation now requires a majority of independent directors on public boards. What is unclear is the ability of management to overcome the effectiveness of board oversight when the number of outside directors is in the majority.

Dunn (2004) attempted to address the power issue by comparing two groups of firms convicted of financial statement fraud: firms with large concentrations of ownership power and firms lacking ownership power. He found that financial statement fraud was more likely to occur in firms where insiders had high ownership power. Like previous researchers, the number of insider board members was positively correlated with the incidence of fraud. However, the relative stock ownership of insiders to outsiders was *more* significant and had a large impact on the likelihood of fraud. Sensitivity tests suggested that alternative forms of corporate governance could be overcome when insiders had a concentration of relative ownership power. This is why we chose the relative measure of equity ownership used in this study.

Recognizing that there is an agency relationship between owners, independent board members, and insiders, stock ownership can have a positive incentive effect to align the interests of both groups with shareholders (Jensen and Meckling, 1976). However, if the level of board equity ownership allows board groups to concentrate their power and incentives are low, entrenchment may set in.

Entrenchment occurs when a manager (or other party in an agency relationship), has enough firm equity, influence, or power to overcome governance constraints on their behavior (Fama and Jensen, 1983). Entrenchment studies have shown that this can occur at very low levels of absolute ownership (Morck, Shlefier, and Vishny , 1988; Short and Keasy, 1999; Griffith, Fogelberg, and Weeks, 2002; Peasnell, Pope, and Young, 2003; Warfield, Wild, and Wild, 1995; Yeo, Tan, and Chen, 2002). These studies defined entrenchment levels as the percent of total equity owned and tested for *management* entrenchment using a variety of measures, such as firm value, performance, demand for outside directors, discretionary accruals, and the information content of earnings.

We test for entrenchment of *board groups* to measure the power and incentive effects of independent and insider board members. We use the proportionate ownership of the independent and insider board members to total board equity as a proxy for power and incentives consistent with Dechow et. al., 1996 and Dunn, 2004.

We measure entrenchment by assessing the persistence of earnings as measured by the quality of accruals. The quality of accruals refers to working capital accruals and how well those accruals match their related cash flows. Prior studies have shown low earnings quality, proxied by

levels of discretionary accruals, when entrenchment has occurred. We choose to measure earnings *quality* as opposed to earnings *management* for several reasons.

First, discretionary accrual models used to measure earnings manipulation can contain specification and measurement errors that can bias results and result in erroneous research findings (McNichols, 2002). Second, the power of the models to find earnings manipulation is low. Dechow, Sloan, and Sweeney (1995) find that earnings management of less than 5% of total assets is likely to go undetected. In addition, Dechow and Dichev (2002) point out that traditional measures of earnings manipulation suggest that managerial intent affects the size and incidence of accrual estimation errors. They argue that accrual quality will be related to firm and industry characteristics, absent earnings manipulation. For example, the volatility of operations will be related to the likelihood of estimation errors, which will be recurring and observable, as opposed to earnings management, which is often unobservable. Finally, while poor earnings quality can result from earnings management, it can also result from management shirking, incompetence, or just honest estimation errors. The important factor is the quality of earnings, not the exact nature of the cause.

The research on the composition and effectiveness of boards raises issues with respect to the power of insider and independent board members. Agency conflicts are shown for both groups and the relative equity ownership of both groups is relevant, first to their incentive to act in owners' interests and second, to their ability to exert control.

We hypothesize that when board insider ownership is low, insiders lack sufficient power to act in their own self-interest. Independent board members have the power to keep insiders from reporting low quality earnings. The absence of a negative correlation in this range indicates that independent board members are performing their monitoring function.

H1: In public companies, when relative board insider ownership is low, earnings quality is not correlated with or is positively correlated with insider ownership.

At very high relative levels of board insider ownership, insiders have more power than independent board members and as absolute ownership increases, more incentive to act in owners' interests. The absence of a negative correlation between earnings quality and insider ownership is indicative of convergence-of-interests for insider board members.

H2: In public companies, when relative board insider ownership is high, earnings quality is not correlated with or is positively correlated with insider ownership.

Entrenchment sets in when board insider ownership is high enough for insiders to dominate but total equity ownership is not high enough to provide incentive to protect owners' interests.

H3: In public companies, earnings quality is negatively correlated with relative board insider ownership in the entrenchment range.

While stock ownership is meant to align the interests of management and owners, it is not the only mechanism used by owners to protect their interests. Boards of directors and audit committees are two of the primary monitoring mechanisms employed by owners to monitor management behavior. Effective monitoring should improve earnings quality as board members keep insiders from engaging in behavior inconsistent with owners' interests. Consistent with the requirements of the Sarbanes-Oxley Act of 2002, research has shown that the independence of the full board and audit committee may contribute to the effectiveness of monitoring (Weisbach 1988; Dahya et al. 2002; Klein 2002a; Xie et al. 2003; Krishnan 2005; Archambeault and DeZoort 2001).

However, there are additional factors that impact the effectiveness of the board such as board size (Anderson et al. 2004; Klein 2002b; Brown and Caylor 2004), director attendance (Allen et al. 2004), number of board appointments (Young et al. 2003; Fich and Shivdasani 2004) and power (Dunn 2004). Having the firm's Chief Executive officer also serve as the Chairperson of the Board (called CEO/COB duality) can also compromise the independence of the board and the audit committee causing both mechanisms to be less effective (Farber 2005; Brown and Caylor 2004).

Recognizing that single mechanisms can be compromised, firms employ many controls to define their governance structure. Some mechanisms act as substitutes for others and some are complementary (see Farinha 2003 for a survey of corporate governance literature), implying that the exact combination of mechanisms employed is firm-specific. Recognizing the unique nature of each firm's governance structure, more recent research (Gompers, Ishii, & Metrick, 2003: Brown & Caylor, 2004) incorporates governance composite indexes that represent the combined strength of all mechanisms employed. Early results show that firms with higher governance indexes exhibit higher market returns, higher firm value (Tobin's Q), and better operating performance than firms with lower indexes (Gompers et al. 2003). We hypothesize that effective governance will also have a positive effect on earnings quality because stronger oversight of management reduces management's likelihood to shirk or commit fraud.

H4: In public companies, the effectiveness of governance is positively correlated with earnings quality.

However, Dunn (2004) showed that when insiders gain effective control, they might be able to overcome governance mechanisms put in place to control their behavior.

H5: In public companies, earnings quality is negatively correlated with relative board insider ownership for firms that are entrenched, irrespective of all other governance mechanisms.

RESEARCH DESIGN AND VARIABLE DEFINITIONS

We examine earnings quality across relative board insider ownership (BIO) levels. To test for entrenchment, we divide BIO into intervals of five percent and run piecewise linear regressions at different BIO intervals to estimate the coefficient on BIO. Changes in the slope, or in its sign, at two different thresholds indicate the range of entrenchment for BIO. We use the following empirical model to test Hypotheses H1, H2, and H3 in each of three ranges: below entrenchment, at entrenchment, and above entrenchment.

$$|SEE|_{f,t} = b_0 + b_1 BIO_{f,t} + e_{f,t} \quad (1)$$

where:

$|SEE|_{f,t}$ = absolute value of standardized estimation errors found in accruals for firm *f* at time *t* using the Dechow and Dichev Model(2002)(discussed below);

$BIO_{f,t}$ = proportion of insider (management and affiliated directors) equity to total board equity for firm *f* at time *t*;

$e_{f,t}$ = the error term for firm *f* at time *t*.

Governance mechanisms are put in place to monitor and control management behavior. If effective, governance and earnings quality should be positively correlated. Model (2) is used to test H4:

$$|SEE|_{f,t} = b_0 + b_1 GI_{f,t} + e_{f,t} \quad (2)$$

where all variables are as defined above and:

$GI_{f,t}$ = a discrete governance index variable indicating the effectiveness of a composite of governance mechanisms for firm *f* at time *t* (discussed below).

We regress BIO and GI on |SEE| for firms in the entrenchment range to assess the combined effect of both BIO and GI on earnings quality. We use following multivariate regression model to test H5:

$$|SEE|_{f,t} = b_0 + b_1 BIO_{f,t} + b_2 GI_{f,t} + e_{f,t} \quad (3)$$

where all variables are as defined above.

We use the Dechow and Dichev model (2002) of accrual estimation errors as a proxy for earnings quality. The model uses the following equation to measure earnings quality:

$$\Delta WC_t/TA_t = b_0[1/TA_t] + b_1[CFO_{t-1}/TA_t] + b_2[CFO_t/TA_t] + b_3[CFO_{t+1}/TA_t] + e_t \quad (4)$$

where:

ΔWC_t = change in accounts receivable (Compustat #302), plus the change in inventory (Compustat #303), minus the change in accounts payable (Compustat #304), minus the change in taxes payable (Compustat #305), plus the change other assets (Compustat #307) at time t;

CFO_{t-1} = cash flows from operations for the prior period;

CFO_t = cash flows from operations for the current period;

CFO_{t+1} = cash flows from operations for the next period;

TA_t = average total assets for a firm in the current period.

The model captures the extent to which accruals map into cash flow realizations, measuring any estimation errors using the error term (e_t). We scale all variables by average total assets (TA_t) (Compustat #6) to account for differences in firm size. The intercept (b_0) is included to measure positive working capital accruals related to firm growth.

We estimate the model cross-sectionally, using a 3-year period to derive $CFO_{t-1,}$ $CFO_{t,}$ and CFO_{t+1}. We used the model for t = 2002 because wide-scale accumulation of governance data is not available prior to 2002. In addition, 2002 was the year that Sarbanes-Oxley was enacted, but not fully effective. We wanted to examine earnings quality prior to governance reform.

Following Dechow and Dichev (2002), we ran the regression in (4) for all sample firms in a 2-digit SIC code (We also classify firms using the Fama-French industry classification for comparison purposes. See Table 1, panel B).

We required a minimum of 30 observations for each 2-digit industry group to obtain sufficient power for a .05 significance level (Hair et. al. 1998, 165). We expected the size of earnings, cash flows, and accruals to vary across industry, be larger for firms with large absolute accruals, and estimation errors to be higher for firms in difficult forecasting environments (McNichols 2002). To address these concerns, we standardized the measure of earnings quality derived from equation (4) for each firm ($e_{f,t}$) to remove any industry effects as follows:

$$SEE_{f,t} = (e_{f,t} - x_i) / s_i \quad (5)$$

where:

$SEE_{f,t}$ = the standardized estimation error for firm *f* at time *t;*

$e_{f,t}$ = the estimation error as measured by equation (4) for firm *f* at time *t;*

x_i = the mean of the estimation error using equation (4) for a 2-digit SIC code industry portfolio of firms;

s_i = the standard deviation of estimation errors for the same 2-digit SIC code industry portfolio of firms.

Both overestimation and underestimation errors impact earnings quality adversely. As such, and consistent with other earnings quality studies (Klein 2002a; Warfield et al. 1995), we use the unsigned (absolute value of) standardized estimation errors (|SEE|) as the dependent variable.

Board insider ownership (BIO) is the proportion of insider common stock ownership (managers and affiliated board members) to total board ownership. We defined affiliated board members as those board members that are not independent of management, as defined by the Securities and Exchange Commission standards (SEC 2003). Sources of data for this measure were provided by The Investor Responsibility Research Center (IRRC 2005), which obtains the data from firm proxy statements.

Effective governance is a calculated governance index using governance data provided by Institutional Shareholder Services (ISS 2003). ISS compiles 61 different variables encompassing eight corporate governance categories: board of directors, audit, charter/bylaws, director education, executive and director compensation, ownership, progressive practices, and state of incorporation.

In this study, we used a calculated governance index (GI) of 51 of the total 61 variables (See Appendix 1 for a detailed listing of the rating criteria based on the minimum governance standard defined by ISS). We awarded one point for each acceptable variable and summed them for a firm-specific index with a maximum value of 51. We used this index as the measure of governance effectiveness, where a high score was considered more effective than a low score. We do not control for individual governance characteristics, such as independent boards or audit committees for example, as they are included in the computed index. In addition, some governance factors act as substitutes for other factors such that the absence of a factor for a firm may not indicate a weakness if there is a substitute mechanism in place.

SAMPLE AND VARIABLE MEASUREMENTS

We performed our study on a sample of publicly traded firms taken from the S&P 500 (large cap), S&P 400 (mid cap), and S&P 600 (small cap) indices, for the year 2002. Each index contains 500 firms totaling an initial sample of 1,500 firms; Panel A in Table 1 summarizes the sample selection. We restricted the sample to firms with complete data for calculation of working capital accruals and governance indices. We eliminated firms in regulated industries (SIC 4900 - utilities, 6000-6999 – financial institutions), non-domestic firms, outliers, and firms that had a fiscal year change. In addition, we required at least 30 firms within each SIC grouping. The final sample was comprised of 499 firms representing seven two-digit SIC codes, as shown in Panel B of Table 1.

Table 1: Sample Used in the Analysis	
Panel A: Sample reconciliation	
Initial S&P indices sample for 2002	1,500
Missing Compustat data	(7)

Table 1: Sample Used in the Analysis	
Panel A: Sample reconciliation	
Utility firms (SIC code 4900)	(91)
Financial Service firms (SIC codes 6000 – 6999)	(233)
Non-US firms	(3)
Firms with a fiscal year change in 2002	(3)
Outliers	(42)
Firms with missing governance data	(70)
SIC code 20	(30)
Firms with less than thirty observations	(522)
Final Sample	499
Panel B: SIC (Fama-French Codes) and Corresponding Number of Firms in the Sample	
SIC Code and Industry Name	# of firms
13 (3) Minerals - oil and gas extractions	31
28 (14) Manufacturing – chemicals and allied products	80
35 (17) Manufacturing – industrial machinery and equipment	73
36 (18) Manufacturing – electrical and electrical equipment	103
37 (19) Manufacturing – transportation equipment	35
38 (20) Manufacturing – Instruments and related products	72
73 (32) Service – business services	105
Final Sample	499

The measure of earnings quality we used is the absolute value of the standardized residual of industry regressions using regression model (4) repeated here:

$$\Delta WC_t/TA_t = b_0[1/TA_t] + b_1[CFO_{t-1}/TA_t] + b_2[CFO_t/TA_t] + b_3[CFO_{t+1}/TA_t] + e_t \quad (4)$$

We defined change in working capital accruals (ΔWC_t) as the change in accounts receivable, plus the change in inventory, minus the change in accounts payable, minus the change in taxes payable, plus the change in other assets. We used net cash provided by operating activities from the statement of cash flows as cash flows from operations (CFO). The intercept (b_0) was included to measure positive working capital accruals related to firm growth. The year $_t$ is 2002, $_{t-1}$ is 2001, and $_{t+1}$ is 2003. We scaled all variables by average total assets, consistent with the Dechow and Dichev

Model (2002). All values were obtained from Compustat as defined in the variable definition section of the paper. Table 2 presents the descriptive statistics for the variables used in the model as well as statistics for other variables related to cash flows and accruals to validate the relationships predicted in the model.

An examination of Panel A in Table 2 reveals that the descriptive statistics are in line with Dechow and Dichev (2002). CFO is consistent across lagged (CFO_{t-1}), current (CFO_t), and future periods (CFO_{t+1}) and exceeds earnings in time t ($Earn_t$), implying that short-term accruals are negative. Average total accruals (Acc_t) are negative (-.0887), primarily because of depreciation. The size of the firms, in terms of average total assets, varies significantly (standard deviation of 21,809) and the mean (5,419) is well in excess of the upper quartile indicating a skewed distribution. The average operating cycle of the sample firms is 151 days, consistent with the Dechow and Dichev (2002) model assumption that changes in working capital accruals relate to cash flows within a one-year time frame. Frequency distributions (not shown) reveal that 97.6 percent of the sample firms have an operating cycle of less than one year.

Table 2: Descriptive Statistics and Correlations for 2002 Earnings Quality Using the Dechow and Dichev Model

Panel A: Descriptive Statistics (n=499)

Model and Related Variables	Mean	Std Dev	Lower Quartile	Median	Upper Quartile
Change in working capital (ΔWC_t)	-.0081	.04043	-.0286	-.0055	.0165
Cash flow from operations (CFO_{t-1})	.1032	.10309	.0542	.0999	.1500
Cash flow from operations (CFO_t)	.1100	.09584	.0628	.1083	.1579
Cash flow from operations (CFO_{t+1})	.1181	.11484	.0580	.1136	.1738
Earnings before long-term accruals ($Earn_t$)	.1019	.08990	.0618	.0991	.1417
Earnings before long-term accruals ($Earn_{t+1}$)	.1195	.11976	.0606	.1096	.1746
Earnings before extraordinary items ($Prof_t$)	.0213	.13742	-.0028	.0408	.0778
Accruals ($Prof_t - CFO_t = Acc_t$)	-.0887	.10109	-.1112	-.0711	-.0412
Average total assets (in dollars million)	5,419	21,809	442	1,092	2,917
Average Operating Cycle (in days)	151	84	91	132	200

Pearson correlations in Panels B and C of Table 2 show the sign and strength of the relationship between variables that underlie the model design.

Table 2 Continued

Panel B: Pearson Correlations

	ΔWC_t	CFO_{t-1}	CFO_t	CFO_{t+1}	$Earn_t$	$Prof_t$	Acc_t	$Earn_{t+1}$
ΔWC_t		-.035	-.353**	.019	.073	.047	.399**	.031
CFO_{t-1}	-.035		.720**	.690**	.752**	.566**	.086*	.678**
CFO_t	-.353**	.720**		.797**	.907**	.678**	-.027	.813**
CFO_{t+1}	.019	.690**	.797**		.858**	.610**	.074*	.915**
$Earn_t$	.073	.752**	.907**	.858**		.744**	.151**	.881**
$Prof_t$	.047	.566**	.678**	.610**	.744**		.717**	.630**
Acc_t	.399**	.086*	-.027	.074*	.151**	.717**		.085*
$Earn_{t+1}$	.031	.678**	.813**	.915**	.881**	.630**	.085*	

Prior research provides the predictions for the relationships between the variables (Barth et al. 2001; Dechow and Dichev 2002). Our results confirmed these relationships. Note that the correlations between the change in working capital (?WC_t) and past and future cash flows (CFO_{t-1} and CFO_{t+1}) are -.035 and .019 and are insignificant. These were expected to be significant and positive. Panel C shows that after controlling for the effect of current cash flows (CFO_t), both correlations are positive and significant. We also find positive correlations between earnings ($Earn_t$) and past cash flows (CFO_{t-1}) (.752), and accruals (Acc_t) and past cash flows (CFO_{t-1}) (.086), significant at the .05 level.

Table 2 Continued

Panel C: Pearson Correlations (controlling for the effect of CFO_t

Pearson Correlation	CFO_{t-1}	CFO_{t+1}
ΔWC_t	.338*	.531*

** Significant at the .01 level

* Significant at the .05 level

Variable definitions:

Cash flow from operations (CFO) = item 308 from the Compustat Statement of Cash Flows;

Change in working capital (ΔWC) = ΔAR + Inventory – ΔAP – ΔTP + Other Assets (net), where AR is accounts receivable, AP is accounts payable, and TP is taxes payable;

Earnings before long-term accruals (Earn) = CFO + ΔWC;

Earnings before extraordinary items (Prof) = Compustat item 123; and

Accruals = Prof – CFO.

Average operating cycle = $360/(Sales_t/Avg\ AR_t) + 360/(CGS_t/Avg\ Inv_t)$

All variables are scaled by average total assets.

Table 3 presents the results of regressions of working capital accruals on past, present, and future cash flows by two-digit SIC groupings. Results from the industry-specific regressions show that the model is well specified for these SIC groups (F statistics are all significant at the .05 level). The variability of the change in working capital accruals (?WC_t) explained by the model ranges from a low of 32.4 percent (SIC code 38) to a high of 67.8 percent (SIC code 13). These results are consistent with Dechow and Dichev (2002) who reported a mean adjusted R^2 on an industry basis of 34 percent.

Table 3: Regressions of the Change in Working Capital on Past, Current, and Future Cash Flow From Operations for the Year 2002

$\Delta WC_t/TA_t = b_0[1/TA_t] + b_1[CFO_{t-1}/TA_t] + b_2[CFO_t/TA_t] + b_3[CFO_{t+1}/TA_t] + e_t$

SIC		Intercept					
		b_0	b_1	b_2	b_3	Adj R^2	F Stat
13	Mean	.019	.096	-.489	.168	.678	22.035
	(t-statistic)	(3.257)	(2.443)	(-7.904)	(4.923)		
28	Mean	.009	.272	-.562	.242	.525	30.102
	(t-statistic)	(2.414)	(5.873)	(-9.392)	(6.061)		
35	Mean	.011	-.021	-.512	.226	.445	20.211
	(t-statistic)	(2.054)	(-.412)	(-6.501)	(2.698)		
36	Mean	.005	.095	-.613	.308	.525	38.636
	(t-statistic)	(.858)	(1.963)	(-10.501)	(6.116)		
37	Mean	-.001	.196	-.663	.430	.613	18.946
	(t-statistic)	(-.157)	(2.201)	(-7.241)	(4.621)		
38	Mean	.009	-.056	-.326	.256	.324	12.356
	(t-statistic)	(1.414)	(-1.011)	(-4.868)	(5.357)		
73	Mean	.000	.185	-.499	.241	.389	23.112
	(t-statistic)	(-.022)	(3.905)	(-8.292)	(5.002)		

The correlations, signs, and sizes of the coefficients between the dependent and independent variables are also consistent with Dechow and Dichev (2002). Changes in working capital accruals (?WC_t) are negatively correlated to current cash flows (CFO_t), positively correlated to future cash flows (CFO_{t+1}), and positively correlated to past cash flows (CFO_{t-1}) except in SIC codes 35 and 38, where the coefficients on past cash flows are negative but not statistically significant. The absolute value of the coefficients on the cash flow variables is less than 1 and smaller for the coefficients on past and future cash flows (CFO_{t-1} and CFO_{t+1}) than for current cash flows (CFO_t), as expected.

Dechow and Dichev (2002) and McNichols (2002) both show that the cash flow coefficients can contain measurement error related to sales growth. To test this premise, we reran the model with a sales growth term (results not shown). The results of the regressions indicate that change in sales did *not* have a significant impact on the model. Examination of the descriptive statistics for ?Sales (not shown) supported this result. The mean was –100.081 and the 5 percent trimmed mean was –2.49. The frequencies (not shown) showed that 45.7 percent of the sample firms have decreases in sales, and the distribution is normal after adjusting for two outliers with large increases in sales (?Sales = 8,861 and 11,362). The results showed that changes in sales do not bias the cash flow variables.

The firm-specific residuals from the SIC regressions are the estimation errors present in the accruals. However, they can contain measurement error if there are differences in the volatility of the industries with respect to forecasting ability. We normalized these differences by standardizing the measure for testing purposes as described previously. We used the unsigned (absolute) value of standardized estimation errors (|SEE|) as the dependent variable.

Board insider ownership (BIO) is the percentage of shares owned by insiders to total board shares. All ownership data was for the year 2002. To get the proportion of total board stock owned by insiders, we combined employee and affiliated shares and divide by the total board shares. The proportion of independent board ownership is, by definition, 1 – (the insider proportion).

Governance index (GI) was a calculated firm-specific index representing the sum of points awarded for 51 governance variables. Descriptive statistics for the |SEE|, BIO, and GI appear in Table 4. (See Appendix 1 for the percentage of firms that meet the minimum governance standard for each of the 51 variables.)

Table 4: Descriptive Statistics for |SEE|, BIO, and GI (N = 499)

Variable	Mean	Standard Deviation	Median	Minimum	Maximum
|SEE|	.7691	.6287	.6156	.00066	3.038
BIO	79.4270	22.8080	88.2050	0.00000	99.900
GI	25.7600	5.3180	25.0000	13.00000	41.000

Variable definitions:
|SEE| = absolute value of standardized estimation errors found in accruals using the Dechow and Dichev Mode l (2002);
BIO = proportion of insider (management and affiliated directors) equity to total board equity;
GI = a continuous governance index variable indicating the effectiveness of a composite of governance mechanisms

The variable, |SEE|, ranged from 0 to just over 3, with a mean of .7691, a median of .6156, and a standard deviation of .6287. The mean of BIO is 79.427. The median, however, was 88.205

indicating that the distribution was skewed. A total of 313 firms (75 percent of the sample) had BIO higher than the mean and 28 percent were in the 95 to 100 percent range. The distribution showed that although the board may be "independent" in terms of the number of directors, insiders owned significantly more stock than independent outsiders. Governance (GI) ranged from 13 to 41 with a mean and median of 25.76 and 25.00 respectively and a standard deviation of 5.318.

PRESENTATION AND INTERPRETATION OF RESULTS

Hypotheses H1 – H3 test the relationship between relative board insider ownership (BIO) and earnings quality (|SEE|). To examine the relationship between BIO and |SEE| at different levels of ownership, we ran regression curve estimates for each BIO increment (increments of 5% ownership). Examination of the best fitting line, significance of the fit for each increment, and the slope of the line indicated break points of 30 percent and 49 percent (points where the slope significantly changes). Table 5 summarizes the results of the curve estimations and shows the descriptive statistics for the IO increments.

Panel A of Table 5 shows that most firms (442) had BIO of 60 percent or higher, 24 firms from 30 to 49 percent, and 33 firms with less than 30 percent. The mean percent of absolute equity ownership owned by insiders rose as BIO rose but did not exceed a mean 7.76 percent (See Panel B; Table 5). The mean level of total equity ownership for independent board members fell as their board ownership proportion fell indicating that increases (decreases) in the proportion of board ownership for both groups followed increases (decreases) in total equity ownership. Each inside ownership group contained firms from each industry and from all three indices, as shown in Panel C and Panel D of Table 5, respectively. As such, neither industry nor S&P index should bias any reported results.

Table 5 - Descriptive Statistics for BIO Groups

Panel A: Curve Estimation Results for IO Groups

Board Insider Own %	Board Independent Own %	n	Mean BIO %	Mean |SEE|	Relationship of IO to |SEE|	p value
0-29	71-100	33	12.76	.7992	Flat	.8177
30-49	51-70	24	41.66	.7262	Positive	.0370
50-100	0-50	442	85.70	.7682	Flat	.1684

Panel B: Total Equity Ownership for BIO Groups

Board Insider Own %	Mean Insider % of Total Equity	Board Independent Own %	Mean Independent % of Total Equity
0-29	.86	71-100	7.48
30-49	1.38	51-70	2.21
50-100	7.76	0-50	.67

Table 5 - Descriptive Statistics for BIO Groups

Panel C: Breakdown of BIO Groups By SIC Code

SIC Code	0 to 29%	% of Total	30 to 49%	% of Total	50 to 100%	% of Total	Total	% of Total	
13	2	6%	1	5%	28	6%	31	6%	
28	7	21%	2	16%	71	16%	80	16%	
35	4	12%	10	27%	59	13%	73	15%	
36	6	18%	4	22%	93	21%	103	21%	
37	1	3%	1	7%	33	7%	35	7%	
38	8	24%	2	5%	62	15%	72	14%	
73	5	15%	4	18%	96	22%	105	21%	
Total	33	100%	24	100%	442	100%	499	100%	

Panel D: Breakdown of BIO Groups by Index

Index	Firm Type	0 to 29%	% of Total	30 to 59%	% of Total	60 to 100%	% of Total	Total	% of Total
S&P 500	Large Cap	15	46%	15	27%	150	37%	180	36%
S&P 400	Mid Cap	9	27%	14	25%	102	25%	125	25%
S&P 600	Small Cap	9	27%	27	48%	158	38%	194	39%
Total		33	100%	56	100%	372	100%	499	100%

Variable definitions:

Board Insider Ownership (BIO) = proportion of employee and affiliated board members' stock ownership to total board stock ownership as determined by SEC independence guidelines;

Independent Ownership = proportion of independent board members' stock ownership to total board stock ownership;

|SEE| = absolute value of standardized estimation errors found in accruals using the Dechow and Dichev Model(2002)

Hypothesis Testing

H1 – H3

Panel A in Table 5 shows the relationships between BIO and |SEE| for the sample firms. The lack of a significant relationship between BIO and |SEE| when insiders had a low relative ownership proportion of board stock (0 – 29 percent; below entrenchment) was consistent with agency theory. In this range, insiders' absolute equity (.86 percent) and relative equity ownership (0 to 29 percent) were low indicating that their interests were not aligned with owners but that they did not have the power to act in their own self-interest. Independent board members relative ownership in this range was from 71 to 100 percent and their absolute equity ownership was higher (7.48 percent) than in any other range and also exceeded insider ownership (.86 percent). The relative levels of ownership

indicated that independent board members could control insiders and that they had more incentive to monitor in this range than in any other ownership range. These test results provided support for hypothesis H1, that earnings quality is not correlated with levels of board insider ownership when insider ownership is low. These results show evidence of convergence-of-interests for *independent board members.*

When insider relative board equity levels were high (50 to 100 percent; above entrenchment), total absolute insider equity ownership was also higher than in any other range (7.76 percent). Insiders had equity control of the board and more incentive to protect shareholder interests. We did not find a significant effect for BIO on earnings quality, as expected. The results at this level of insider ownership provided support for hypothesis H2, that earnings quality is not correlated with insider ownership when relative insider ownership is high.

We did find a significant relationship between BIO and |SEE| in the ownership range of 30 to 49 percent. The relationship was linear, with a positive slope, significant at the .05 level. A positive slope indicated that estimation errors rose (earnings quality fell) as board insider ownership rose within the range. This result was *inconsistent* with convergence-of-interests for both insider ownership and independent board ownership and provides support for hypothesis H3 as follows.

Insiders did not have a majority relative ownership position in this range. Both insiders and independent board members had very low absolute ownership (1.38 percent and 2.21 percent, respectively; see Table 5, panel B), indicating that neither group had the incentive to act in shareholders' interests. Insiders' entrenchment is evidenced by the deterioration of earnings quality; independents' entrenchment is evidenced by the lack of control of insiders' actions even though they held the dominant board ownership position.

The negative effect of insider ownership on earnings quality indicated that neither group was acting in the owners' interests i.e., both groups were entrenched. These findings are consistent with Morck et al. (1988), who found that independent and grey board members with stock holdings responded to financial incentives in a similar fashion to management and could also become entrenched. The results provide support for hypothesis H3 that earnings quality is negatively correlated with relative board insider ownership in the entrenchment range.

H4

Hypothesis 4 posits that the effectiveness of governance is positively correlated with earnings quality. To test this premise, we modeled the relationship between GI and |SEE| using SPSS curve estimation. The curve estimation procedure produces curve estimation statistics and related plots for eleven different curve estimation regression models, such as linear, logarithmic, quadratic, inverse, etc…, to model |SEE| as a function of GI. The best fitting model, as determined by the highest R^2, showed a logarithmic relationship between the variables, significant at the .0510 level (Table 6, Panel A). The log model regresses the log of |SEE| on GI. The coefficient for GI was negative, as expected, and significant (p=.0510). These results provided support for H4, that

governance is positively correlated with earnings quality. However, the explanatory power of the model was low (R^2 = .00764, the percent of variation in the log of |SEE| that can be explained by GI) indicating that governance does not explain very much of the variation in |SEE| when considering all firms.

Table 6 – Panel A – All Firms				
Descriptive Statistics for Governance Index (GI)				
Panel A: SPSS Curve Estimation of GI on |SEE|				
Coefficient on GI	Significance T	F Stat	R^2	Model
-.265869	.0510	3.82806	.00764	Logarithmic

Although entrenchment was found in the board insider ownership range of 30 to 49 percent, a closer examination of the descriptive statistics in Table 5, Panel A shows that the mean value of |SEE| is not significantly different across the ownership ranges. Although there was a significant slope change for BIO on |SEE| within the entrenchment range, parametric ANOVA tests and nonparametric Kruskal-Wallis tests (not shown) failed to show any differences in |SEE| across the three different ownership ranges. These results could occur if governance was effective and able to overcome the negative effect of entrenched board members on earnings quality.

To examine whether GI differed across ownership groups, we conducted an ANOVA test of means of GI for below entrenchment, entrenchment, and above entrenchment groups. Results, show the mean GI for firms below the entrenchment range (27.7879) was significantly higher than the GI for firms above the entrenchment range (25.5181). There were no significant differences between entrenched firms and non-entrenched firms although the mean for entrenched firms (27.4167) was closer in size to the below entrenchment group (Descriptive statistics in Table 6, Panel B; ANOVA test results in Panel C and D). These results indicate that as BIO rises, insiders are able to resist imposition of additional governance mechanisms.

Table 6 – Panel B – Descriptive Statistics – By Group						
BIO Groups	N	Mean	Std. Deviation	Std. Error	Min	Max
0 to 30	33	27.7879	5.49294	.95620	18.00	41.00
31 to 49%	24	27.4167	5.09831	1.04069	17.00	35.00
50 to 100%	442	25.5181	5.28000	.25114	13.00	41.00
Total	499	25.7595	5.31822	.23808	13.00	41.00

Table 6- Panel C - ANOVA					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	227.439	2	113.719	4.070	.018
Within Groups	13857.704	496	27.939		
Total	14085.142	498			

Variable definitions:

|SEE| = absolute value of standardized estimation errors found in accruals using theDechow and Dichev Model(2002);

BIO = proportion of insider (management and affiliated directors) equity to total board equity;

GI = a continuous governance index variable indicating the effectiveness of a composite of governance mechanisms

Table : Panel D – Differences Between Groups				
BIO	BIO Groups	Mean Difference	Std. Error	Sig.
< 30%	> or = 30 % & < 50%	.37121	1.41801	1.000
	> or = 50%	2.26978(*)	.95386	.053
> or = 30 % & < 50%	< 30%	-.37121	1.41801	1.000
.	> or = 50%	.1.89857	1.10785	.262
> or = 50%	< 30%	-2.26978(*)	.95386	.053
	> or = 30 % & < 50%	-1.89857	1.10785	.262

* The mean difference is significant at the .05 level.
Variables as defined in Panel C

To examine the impact of governance on entrenchment, we divided the firms in the entrenchment range into high and low governance groups based on the median governance index. ANOVA tests of differences in means for governance between the above median and below median groups, shown in Table 7, were significant (F=35.267, p=.000). Tests for differences in BIO between the above and below median governance groups also showed significant differences (F=14.438, p=.000). Examination of the group differences showed that entrenched firms with lower governance had significantly higher relative board insider ownership.

This implied that as relative board insider ownership rose to higher levels within the entrenchment range, insiders were able to resist imposition of additional governance constraints. This result, however, did not address whether GI was effective at reducing |SEE| (improving earnings quality) in the entrenchment range.

Table 7" ANOVA on Above and Below Median GI for Entrenched Firms

Panel A: GI Within the Entrenchment Range For Firms Above and Below Median GI

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	368.167	1	368.167	35.267	.000*
Within Groups	229.667	22	10.439		
Total	597.833	23			

* Indicates significant differences in the means of GI between low and high governance within the entrenchment group

Panel B: BIO Within the Entrenchment Range For Firms Above and Below Median GI

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	763.904	1	763.904	14.438	.000*
Within Groups	2857.043	54	52.908		
Total	3620.947	55			

* Indicates significant differences in the mean BIO between high and low governance firms within entrenchment

To examine this possibility, we ran a univariate regression of GI on |SEE| for entrenched firms. The coefficient on GI was -.051 indicating that as governance rose, estimation errors fell (See Table 8; Panel A). The relationship was statistically significant (F=5.083, p=.034, R^2=.188) indicating that governance did significantly impact earnings quality for entrenched firms. This evidence is consistent with the results from the full sample and provides support for hypothesis H4 that effective governance is positively correlated with earnings quality.

H5

Hypothesis 5 tests the relationship of earnings quality in entrenched firms to board insider ownership and predicts that they are negatively correlated, irrespective of all other governance mechanisms. In univariate tests of entrenched firms, BIO had a significant negative effect on earnings quality and GI had a significant positive effect on earnings quality. Results of a multivariate regression of BIO and GI on |SEE|, shown in Table 8, Panel B, showed a more significant model (F=4.654, p=.021, adjusted R^2 = .241) than the univariate results.

The signs on both coefficients were consistent with the univariate results but the size and significance of both coefficients was smaller indicating that the presence of each variable had a moderating effect on the other (BIO = .035, t=1.903, p=.071; GI = -.042, t=-1.936, p=.066). When considered together, more of the variation in earnings quality is explained and while both factors have less of an effect individually, governance has a stronger effect on earnings quality than BIO.

These results may explain why there were no significant differences in earnings quality among ownership groups, even though earnings quality declined in the entrenchment range. This finding *did not* provide support for hypothesis H5, that earnings quality is negatively correlated with relative board insider ownership in the entrenchment range, irrespective of all other governance mechanisms. The effectiveness of governance was able to moderate the negative effect of entrenchment.

Table 8: Regression Results for Entrenched Firms N = 24		
Panel A: GI on |SEE|		
Variable	Expected Sign	Coefficient (p-value)
Intercept		2.125 (.003)
GI	-	-.051 (.034)
Panel B: GI and BIO on |SEE|		
Variable	Expected Sign	Coefficient (p-value)
Intercept		.445 (.680)
GI	-	-.042 (.066)
BIO	0	.035 (.071)
All variables as defined in Table 4		

SUMMARY AND CONCLUSIONS

In this study, we examined the incentive and power effects of the equity ownership of board groups on earnings quality. Agency conflicts are shown for both groups and the relative equity ownership of both groups is relevant, first to their incentive to act in owners' interests and second, to their ability to exert control. We found that all board members, both independents and insiders, can become entrenched if they have low incentives to act in owners' interests, as reflected by the varying levels of power and incentives. When relative ownership for independent board members was high (power) but absolute ownership was low (incentive), we found a negative correlation with earnings quality. In the entrenchment range, independent board members had the power to act in owners' interests, but neither independent nor insider board members had the incentive to do so. The negative effect on earnings quality indicated that both groups were entrenched. Conversely, when relative board ownership was high (for either group) in conjunction with absolute equity ownership, we found no effect for ownership on earnings quality. Our findings supported an agency relationship between independent board members and owners, consistent with the research results of Beasley (1996) and Dechow et al., (1996). This is significant in two ways: 1) we provided evidence of entrenchment related to *earnings quality*, not just for extreme forms of earnings management such as fraud, and 2) we showed that earnings quality was directly affected by

entrenched board members, both independent and insider board members. Our findings implied that relying on the independence of the board, or board committees, to ensure high quality earnings and/or high levels of internal control may be inadequate if board members are entrenched.

We also examined the effect of governance on earnings quality to determine if entrenched board members could overcome governance constraints. Test results showed that as relative insider board ownership rose, governance was lower indicating that insiders were able to avoid the imposition of additional governance mechanisms. Governance, however, still had a positive effect on earnings quality, even on entrenched firms. When insider ownership and governance were considered together for entrenched firms, we found that negative entrenchment effects could be moderated by effective governance structures. These results were inconsistent with Dunn (2004) who found that entrenched insiders could overcome governance constraints in fraud firms. However, Dunn limited the governance mechanisms considered in his study to board and audit committee characteristics while our study incorporated a broader measure of the governance structure as a whole. These results implied that stakeholders should consider the relative level of board ownership and the total governance structure in tandem when assessing risk.

There are several caveats to consider when interpreting these results that suggest areas for future research. First, because our research design was cross sectional, we were forced to use industry measures of earnings quality (as opposed to firm-specific measures), which are less precise and may contain more measurement error. We also eliminated many industries from the sample because there were not enough observations to apply the Dechow and Dichev Model (2002). As a result, the ability to generalize these results to other years and other industries is constrained.

Second, we did not consider the composition of the board, except as it related to independence. It is possible that certain board members represent blockholders and/or institutional investors, groups that can have interests that differ from both management and owners, which may have affected the results. We did not consider the selection of board members and management's role in the selection process, which may also impact the results.

Finally, we did not identify which specific combinations of governance variables were effective in controlling earnings quality. There were no significant differences in independent boards or audit committees between groups indicating that other governance variables, in combination with these, are important in designing an effective governance structure. Future research, aimed at identifying the best combination of governance factors, would significantly add to the literature.

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APPENDIX

Appendix 1: Strength of Governance Structure Rating Criteria and Percent of Sample Firms That Meet Minimum Governance Standards

ISS compiles 61 different factors encompassing the eight corporate governance categories shown below. We omitted four provisions of poison pills and six provisions related to the state of incorporation. Poison pills require shareholder approval. The specific provisions were not considered. We assumed that shareholders in the approval process considered these items and that shareholder approval implied that they deemed them in their best interests. As to the state of incorporation, the only consideration is whether the firm is incorporated in a state with or without stakeholder laws. The specific laws are not necessary for this evaluation and only served to subdivide the sample needlessly. We eliminated the provision that measures officer and director ownership as "at least 1 percent but not over 30 percent of total shares outstanding" because we used a specific measure of ownership for each director in the testing.

Consistent with Brown and Caylor (2004), we separated one provision into two components: poison pill and blank check preferred stock. All these adjustments resulted in consideration of 51 separate provisions of governance.

We determined whether or not a firm's governance was acceptable (coded 1) or unacceptable (coded 0) by comparing the data for each firm with governance best practices as provided in the *ISS Corporate Governance: Best Practices User Guide and Glossary* (2003) and with empirical research results (similar to Brown and Caylor, 2004). The factors for minimally acceptable governance standards, by category, and the percentage of firms meeting those standards follow. The chart includes the percentages for all firms, firms below entrenchment ("Below E"), firms that are entrenched ("E"), and firms above entrenchment ("Above E") that meet the minimum governance standards.

Minimum Governance Standard	All Firms	Below E	E	Above E
Category 1: Board of Directors				
Board is controlled by more than 50 % independent directors	89.6%	93.9%	85.1%	86.0%
Compensation committee is composed solely of independent directors	82.6%	78.8%	86.2%	82.0%
Nominating committee is composed solely of independent directors	61.7%	57.6%	71.3%	59.7%
Governance committee exists and meets at least once during the year	70.1%	66.7%	74.5%	69.4%
Size of the board is at least six but not greater than fifteen members	94.6%	90.9%	93.6%	95.2%
Shareholder approval is required to change board size	12.8%	12.1%	10.6%	13.4%
Shareholders have cumulative voting rights to elect directors	10%	12.1%	9.6%	9.9%
Board members are elected annually	39.5%	33.3%	39.4%	40.1%
CEO serves on no more than two other boards of public companies	92.6%	90.9%	94.7%	92.2%
Outside directors serve on no more than five addn'l boards of public companies	4%	6.1%	3.2%	4.0%
No former CEO's sit on the board	76.2%	81.8%	80.9%	74.5%
The CEO and chairman duties are separated and a lead director is specified	56.5%	54.5%	61.7%	55.4%
Board guidelines are published in the firm proxy statement	36.3%	39.4%	31.9%	37.1%
Managers respond to all shareholder proposals within twelve months of the last shareholder meeting	98.2%	97.0%	98.9%	98.1%

Minimum Governance Standard	All Firms	Below E	E	Above E
Directors attend at least 75 % of board meetings or have a valid excuse for non-attendance	97.8%	93.9%	98.9%	97.8%
Shareholders vote on directors selected to fill vacancies	39.9%	30.3%	31.9%	42.7%
CEO is not listed as having a related party transaction in the proxy statement	84.2%	97.0%	90.4%	81.5%
Category 2: Audit				
Audit committee consists solely of independent outside directors	83.8%	93.9%	87.2%	82.0%
Consulting fees paid to auditors are less than audit fees paid to auditors	77.2%	87.9%	76.6%	76.3%
Company has a formal policy of audit rotation	18.6%	18.2%	23.4%	17.5%
Auditors were ratified at the most recent shareholder meeting	60.9%	63.6%	55.3%	62.1%
Category 3: Charter/Bylaws				
Company either has no poison pill or a pill that has shareholder approval	33.7%	36.4%	27.7%%	34.9%
A simple majority is required to approve a merger (not a supermajority)	64.1%	57.6%	68.1%	63.7%
A majority vote is required to amend charter/bylaws (not a supermajority)	4.4%	36.4%	33.0%	43.0%
Shareholders are allowed to call special meetings	37.7%	36.4%	30.9%	39.5%
Shareholders may act by written consent and the consent is non-unanimous	24.8%	24.2%	21.3%	25.8%
Company is not authorized to issue blank check preferred stock (stock over which the board has broad authority to determine voting, dividend, conversion and other rights)	10.2%	15.2%	10.6%	9.7%
Board cannot amend bylaws without shareholder approval or can only do so under limited circumstances	40.7%	6.1%	5.3%	4.0%
Company has a single class of common stock	92.8%	100%	94.7%	91.7%
Category 4: Director Education				
One or more directors have participated in an ISS-accredited director education program	13.6%	15.2%	13.8%	13.4%
Category 5: Executive and Director Compensation				
No interlocks exist among directors on the compensation committee	98.8%	97.0%	98.9%	98.9%
Non-employees do not participate in the company pension plans	97.00	100%	98.9%	96.2%
Option re-pricing did not occur within the last three years	93.8%	97.0%	95.7%	93.0%
Stock incentive plans were adopted with shareholder approval	80.4%	84.8%	84.0%	79.1%
Directors receive all or a portion of their fees in stock	94.4%	84.8%	97.9%	94.4%
Company does not provide any loans to executives for exercising options	90.2%	90.9%	90.4%	90.1%
The last time shareholders voted on a pay plan, ISS did not deem its costs to be excessive	58.3%	69.7%	54.3%	58.3%
The average options granted in the past three years as a %age of basic shares outstanding did not exceed 3 % (option burn rate)	11.0%	15.2%	9.6%	11.0%
Option re-pricing is prohibited	44.5%	48.5%	41.5%	44.9%
Company expenses stock options	5.8%	12.1%	3.2%	5.9%
Category 6: Ownership				
All directors with more than one year of service own stock	91.8%	87.9%	92.6%	91.9%
Executives are subject to stock ownership guidelines	25.3%	33.3%	24.5%	24.7%
Directors are subject to stock ownership guidelines	21.0%	24.2%	21.3%	20.7%

Minimum Governance Standard	All Firms	Below E	E	Above E
Category 7: Progressive Practices				
Mandatory retirement age for directors exists	31.3%	33.3%	23.4%	33.1%
Performance of the board is reviewed regularly	36.9%	36.4%	35.1%	37.4%
A board-approved CEO succession plan is in place	31.5%	36.4%	28.7%	31.7%
Board has outside advisors	29.9%	33.3%	25.5%	30.6%
Directors are required to submit their resignation upon a change in job status	21.4%	30.3%	21.3%	20.7%
Outside directors meet without the CEO and disclose the number of times they meet	36.7%	45.5%	35.1%	36.3%
Director term limits exist	4.0%	3.0%	5.3%	3.8%
Category 8: State of Incorporation				
Incorporation in a state without any anti-takeover provisions	2.6%	0%	2.1%	3.0%

UNDERWRITER'S PRESTIGE AND PRE-IPO OPERATING PERFORMANCES

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ABSTRACT

This paper presents an empirical test on the relationship between underwriter's prestige and issuing firm's pre-IPO operating performances during the Internet bubble period. Sales growth rate is a significant factor for prestigious underwriters when selecting Internet firm, whereas cash flow per share and sales per share are significant factors when selecting non-Internet firms. Overall, prestigious underwriters select larger and more profitable firms compared to their counterparts. This study also provides explanation for underwriting large amounts of small and young firms by prestigious underwriters, which was unusual in the 1980s and early 1990s.

KEYWORDS: IPO, Underwriter, Prestige, and Operating Performance.

INTRODUCTION

Investment banks play important roles for firms going public, including marketing, pricing, share distribution, analyst coverage, and price support. A large block of literature has investigated the relationship between the underwriter's prestige and the issuer's first-day market performance (Beatty & Ritter, 1986; Tinic, 1988; Johnson & Miller, 1988; Carter & Manaster, 1990; Michaely & Shaw, 1994; Carter, Dark & Singh, 1998, McLaughlin, Safieddline & Vasudevan, 2000; and Hoberg, 2007).

Well-known studies have indicated that high-quality underwriters, using Carter-Manaster's (1990) or Ritter's (published at his website) rankings, seemed to leave less money on the table for investors in the 1980s. However, the situation was reversed during the years 1999 to 2000, commonly referred to as the Internet bubble period, when high quality underwriters underpriced their issues more severely than other underwriters (Beatty & Welch, 1996; Ritter & Welch 2002; and Loughran & Ritter, 2004). Instead of ranking underwriter quality by market share as did Carter-Manster and Ritter, Hoberg (2007) used past underpricing as a measure of underwriters' quality and found persistent initial return differences between highest and lowest quartile underwriters. Thus, several researchers investigated the correlation of initial underpricing and underwriters' reputation from various aspects, such as analyst coverage, share allocation, price support, and asymmetric

information. However, few studies have tried to explore the area of underwriter and issuing firm's self-selection process.

Instead of focusing on underwriter-issuing firm relationships, Gonzalez and James (2007) investigated the commercial bank lending relations of high technology and non-technology firms. Their results support the view that banks function efficiently as screeners to finance older and more profitable firms, which are also more likely to receive funding from venture capitalists. These findings sparked research investigations on underwriters' and issuing firms' selection practices, such as (1) what characteristics of issuing firms are preferred by high-reputation underwriters and (2) what are the differences in characteristics of issuing firms underwritten by high- and low-reputation underwriters.

The most common recognized roles of the underwriters' reputation are to reduce information asymmetries and to mitigate the adverse selection faced by outside investors (McLaughlin, Safieddine & Vasudevan, 2000). The well-known Myers and Majluf (1984), Miller and Rock (1985), and Rock (1986) models proposed that asymmetric information between issuing firms and outside investors creates negative market reaction to equity issue announcements. Choosing high-quality underwriters conveys favorable signals to less-informed investors regarding the superior quality of issuing firms, since high quality underwriters are assumed to have strict standards which thereby act as a certification of an issuing firm's values. From the view of underwriters, selecting large and high-quality issuing clients has benefits, too. By doing this, prestigious underwriters can maintain their reputation and charge a high fee (Carter & Manaster, 1990). Non-prestigious underwriters must take on those issuers who are unfavorable to prestigious underwriters.

Tinic (1988) examined underwriters' selection and found that both issue size and risk are very important. More prestigious underwriters avoid smaller and more speculative firms since those issuers are more likely to fail—and incur greater legal liabilities under the due diligence requirement—than undertaking larger and less speculative firms. Wolfe et al. (1994) utilized total registration of the issue and the standard deviation of excess return on the IPO during the first 20 days to measure size and risk; they found that prestigious underwriters emphasized larger and less risky issues, which is consistent with the legal liability hypothesis proposed by Tinic.

Previous researchers generally agreed that prestigious underwriters are associated with low risk and large offerings, but Ritter and Welch (2002) proposed that in the Internet bubble period, prestigious underwriters lowered their issuing standards and took public a large number of very young and small firms with negative earnings. Ritter and Welch noted that it was unusual for a prestigious investment banker in the 1960s and 1970s to take a firm public that did not have at least four years of positive earnings.

Based on this assertion, this study investigates (1) how all underwriters behaved in the Internet bubble period and (2) how high-quality and low-quality underwriters acted during the Internet bubble period. Unlike previous research, this article uses a broad range of variables regarding pre-IPO operating performance information to measure the issuing firm's quality.

Moreover, Internet and non-Internet firms are investigated separately to capture the behavior differences in the optimistic environment of the Internet bubble period.

This study's results show that prestigious underwriters (with a Jay Ritter's ranking 9.1) account for around 60 percent of total issues, almost evenly split between Internet and non-Internet firms. Since most Internet firms are very young and small, it is expected that prestigious underwriters have lowered their selection criteria for Internet firms. We found that prestigious underwriters concentrate more on sales growth rates for Internet firms than for non-Internet firms. Traditional measures, such as sales per share and cash flow per share before IPO, are still significant factors for prestigious underwriters when choosing non-Internet firms. Bartov, Mohanram & Seethamraju (2002) stated that the valuation of Internet stocks is difficult because not only do Internet firms invest large amounts in intangible assets but also attempt to transform the way in which business is transacted. Because of short time frames and small size, precise firm value estimation for Internet firms is very difficult. Moreover, under the "overconfident" market condition for Internet industries, growth opportunities instead of assets-in-place become more critical for firm valuation. Growth opportunity then becomes a significant criterion for prestigious underwriters in selecting issuing firms.

During the Internet bubble period, large numbers of Internet firms (376 Internet and 368 non-Internet firms) and large numbers of firms with negative cash flows (83.78 percent for Internet firms and 53.8 percent for non-Internet firms) went public. Prestigious underwriters may have felt they could not afford to lose such a huge part of their market, especially for Internet firms, if they were to stick to their criteria from the 1980s and early 1990s. Chen and Mohan (2002) suggested that underwriters' revenue is derived from both underwriters' spread and issuers' underpricing. In other words, underwriters can be compensated by either charging a higher fee or underpricing their issuers to a greater extent. Findings from this study are consistent with Chen and Mohan's (2002) proposition in that initial returns are much higher for firms underwritten by prestigious underwriters than by non-prestigious counterparts. Further, results also show that Internet firms experience higher initial returns than non-Internet firms. These findings help to explain why prestigious underwriters are willing to underwrite these small and young firms.

The rest of this article (1) describes the sampling method and data resources, (2) reports the analysis of the relationship between underwriters' prestige and pre-IPO operating performance, and (3) gives a summary and conclusions.

SAMPLE SELECTION AND DATA SOURCES

The sample is composed of 744 initial public offerings from January 1, 1999 to January 1, 2001, which is commonly referred to as the "Internet bubble period" (Loughran and Ritter, 2004). Sample firms are identified, and data are collected from Edgar-online for firms priced between January 1, 1999 and January 1, 2001. Based on this time frame, 1117 firms are selected. Several criteria are set to narrow the final sample:

- *The offering could not be an ADR (American Depository Receipts), which excluded 145 firms from the study;*
- *Shares must have been traded on the NYSE, AMEX, and NASDAQ, which excluded another 88 firms;*
- *The company must have been included in the CRSP daily database, which excluded another 13 firm;,*
- *The offering could not be a financial company and must be common stock only, which excluded 81 close end funds, REITs, unit offerings, and other types of financial companies;*
- *The IPO must have had complete data (including offer price, date, amount, and shares offered), which excluded 16 more firms;*
- *An offering must have had an offer price of $5 or more, which excluded three more firms;*
- *The IPO is not combined with warrants or rights, which excluded 10 firms;*
- *The offering could be found in COMPUSTAT, which excluded 16 more firms*.

Additionally, one firm was mislabeled as an IPO. Consequently, after refining the sample by these criteria, 744 firms are included in the final sample. See Table 1.

Internet companies are also identified as "Internet –related" by Edgar-online. This identification is necessary because SIC codes for Internet firms varied widely. Numerous two-digit SIC codes make it nearly impossible to identify Internet stocks from SIC listings (Schultz & Zaman 2001). In our study's sample, most Internet firms carry 73, 59, 48, 36, and 35 as the first two digits of their SIC code. Thus, our final sample includes 376 Internet firms and 368 non-Internet firms.

All firms' pre-offering operating performances are relative to year –1, which is the year prior to IPO, and includes (1) total sales (COMPUSTAT data item 12), (2) net income (COMPUSTAT data item 18), (3) operating cash flow (calculated as income after all expenses plus depreciation and amortization), (4) total debt (sum of total long-term debt plus debt in current liabilities), and (5) total assets (COMPUSTAT item 6).

These operating performance variables are categorized into three groups: (1) operating performance on total assets (including sales on assets, net income on assets, cash flow on assets, and total debt on assets); (2) operating performance on shares outstanding (including sales per share, net income per share, cash flow per share, and total debt per share); and (3) sales growth rates, which is measured as the change of sales between year –1 and year –2 then divided by sales in year –2. Since Internet firms are commonly viewed as young and high growth potential companies, we expect non-Internet firms have better pre-IPO operating performance measures scaled by total assets and shares outstanding, but they have less sales growth rates than Internet firms.

Table 1: Sample Selection Criteria
The IPO firms are identified from Edgar-online.com

Criteria	Number of firms	Total left
Total public issues (January 1, 1999 to January 1, 2001)	1117	
(1) Country of origin (outside the USA)	145	972
(2) Issues from OTCBB, SWX, VANCOUV, MA	88	884
(3) Not found in CRSP (no Permno number)	13	871
(4) Financial companies (including unit offering, REIT, closed-end fund)	81	790
(5) Companies with missing data		
Companies whose offer price was not found	9	781
Companies with missing shares offering data	5	776
Companies with only the first trading return in CRSP	2	774
(6) Companies with offer prices below $5	3	771
(7) Companies issued with warrant or right	10	761
(8) Companies that cannot be located in COMPUSTAT according to their CUSIP	16	745
Companies mislabeled as an IPO	1	744
Total firms used in the study		744

The results in Table 2 show that overall Internet firms have worse pre-IPO operating performances—as measured by net income to total assets, cash flow to total assets, sales per share, net income per share, and cash flow per share. Moreover, there are larger numbers of Internet firms that have negative earnings and cash flows from operations before IPO. For instance, from the sample, 338 out of 376 Internet firms and 235 out of 368 non-Internet firms have negative pre-IPO earnings.

Underwriters' ranking—from Jay Ritter's personal database— is divided into nine categories. To distinguish from Carter-Manaster's ranking, Ritter's ranking is integers followed by a 0.1. Therefore, ranking in this system ranges from 1.1 to 9.1, where 9.1 represents the most prestigious underwriters and 1.1 represents the least prestigious underwriters. Table 3 shows the descriptive statistics among underwriters of all rankings. In addition, Table 3 indicates that the most prestigious underwriters are responsible for 59.87 percent of the market, while underwriters in the other eight categories (non-prestigious underwriters) are responsible for only 40.13 percent of the market.

Table 2: Descriptive Characteristics of Issue Firm's Pre-IPO Operating Performance

Table values are mean pre-IPO operating measures for 744 IPOs in the years 1999 and 2000: 376 firms are Internet-related and 368 are non-Internet related. All firms' operating performance data are relative to year –1, which is one year before firm's IPO and are collected from COMPUSTAT. Sales growth rate is measured as [sales(-1)-sales(-2)]/sales(-2).

	Total (n= 744)	Internet-related (n= 376)	Non-Internet related (n=368)	Difference (t-value) @
A: Scaled by total asset				
Sales/assets	1.1517	1.0305	1.2759	0.588
Income/assets	-0.6739	-0.9871	-0.3538	-5.161**
Cash flow/assets	-0.6199	-0.8964	-0.3386	-4.655**
Debt/assets	0.3365	0.331	0.3421	-0.253
B: Scaled by shares outstanding				
Sales per share	3.4781	0.8865	6.1332	-5.503**
Income per share	-0.3171	-0.4628	-0.1683	-3.370**
Cash flow per share	-0.1064	-0.3893	0.1813	-5.517**
Debt per share	1.8298	0.4808	3.2194	-6.211**
C: Growth rate				
Sales growth rate	4.248	5.3911	3.105	3.41**
D: Number of firms withEarnings<=0	573	338 (89.89%)	235 (63.86%)	
Earnings>0	171	38 (10.11%)	133 (36.14%)	
Cash flow<=0	513	315 (83.78%)	198 (53.8%)	
Cash flow>0	207	48 (12.77%)	159 (43.21%)	

@The differences are based on two-tail tests.
** Significant at .01 level
* Significant at .05 level

Overall, prestigious underwriters set higher offering prices and make monetarily larger offering amounts than less prestigious underwriters. Concerning initial returns, firms taken public by prestigious underwriters experience higher initial returns for both Internet and non-Internet firms than firms taken public by non-prestigious underwriters.

Table 3: Descriptive Characteristics Among Underwriters' Ranking Group

The rankings of underwriters' reputations are from Jay Ritter's IPO data sources. Ranking with 9.1 represents the most prestigious underwriters while 1.1 represents the underwriters with the least reputation. Initial return is defined as the percentage difference between first day closing price and the offering price. Offering size is measured as the amount of shares outstanding multiplied by the offer price.

	Underwriters' ranking	9.1	8.1	7.1	6.1	5.1	4.1	3.1	2.1	1.1
Internet	%age of firms underwritten	30.07%	14.15%	1.9%	1.5%	1.36%	0.95%	0.68%	0.27%	0.14%
	Offer price	15.93	13.86	12.82	11.5	12.8	10.07	8.4	8	8
	Offer amount ($million)	99.87	66.02	50.08	48.71	44.5	26.1	16.24	5.67	8
	Initial return	1.0987	0.6926	0.4162	0.251	0.3603	0.7041	0.1329	0.062	0.1719
Non-Internet	%age of firms underwritten	29.8%	11.02%	2.31%	2.18%	0.95%	0.68%	1.5%	0.41%	0.14%
	Offer price	16.42	13.62	12.79	10.24	10	10	8.14	26.6	7
	Offer amount ($million)	236.37	73.67	51.89	47.64	28.51	28.12	10.68	7.83	14
	Initial return	0.5173	0.4562	0.3337	0.4482	0.1111	0.1456	0.024	0.089	0.063
Total	%age of firms underwritten	59.87%	25.17%	4.21%	3.68%	2.31%	1.63%	2.18%	0.68%	0.28%

RESULTS

Table 4 represents the results of underwriters' self-selection according to pre-IPO performance between prestigious and non-prestigious underwriters. Overall, we want to examine whether prestigious underwriters still select large and less risky (or high performance) firms in the overheated market conditions of 1999 and 2000. Moreover, we want to determine which characteristics prestigious underwriters view when underwriting Internet firms.

For the total firms (Panel A), prestigious underwriters pick firms having significantly lower loss to total assets, lower cash outflow to total assets, higher sales per share, higher sales growth rate, and lower debt to total assets. These results are consistent with the hypothesis that prestigious underwriters take public better-performing firms than non-prestigious underwriters do. Panel B and Panel C state the results for Internet firms and non-Internet firms, respectively. It is interesting to note that there exists a divergence in underwriters' self-selection tastes for Internet firms and for non-Internet firms (see Panel B).

Prestigious underwriters are apparently more concerned with sales growth rates, sales to total assets, and debt to total assets regarding Internet firms, while they consider cash flow to total assets, cash flow per share, sales per share, and debt per share for non-Internet firms. The vast majority of Internet companies are young growth firms with little or even negative earnings. Based on these characteristics of Internet firms, it is reasonable to assume prestigious underwriters focus more on sales growth potential rather than assets-in-place when choosing Internet firms.

The only commonality found between Internet and non-Internet firms is that prestigious underwriters tend to select larger firms. Firms taken public by prestigious underwriters are large in size compared to those taken public by non-prestigious underwriters, which is consistent with previous research. The mean size for Internet and non-Internet firms undertaken by prestigious underwriters is significantly larger than the size of those firms undertaken by non-prestigious underwriters ($658.22 vs. $281.55 million for Internet firms and $1054.93 vs. $251.15 million for non-Internet firms).

The overall results from Table 4 show that prestigious underwriters appear to select large and better-performing firms for both groups. The non-Internet firms selected have better pre-IPO performance than Internet firms selected. Prestigious underwriters may have taken public large numbers of small and young Internet firms based on great growth potential.

Table 5 represents Probit regression results with "underwriter's reputation" as the dependent variable. If the underwriter is prestigious with a ranking of 9.1, the dependent variable equals 1; otherwise, it equals 0. Age (years existing before IPO) is calculated by determining the number of years between the IPO year and the founding year. The months in the founding year and IPO year are not considered. For example, ACLARA BIOSCIENCES INC went public on March 21, 2000 and its founding year was 1995, giving five years of existence before IPO.

Table 4: Pre-IPO Financial Performances Among Prestigious and Non-Prestigious Underwriters

Prestigious underwriters have a ranking 9.1 and non-prestigious underwriters have a ranking 8.1 or below. All financial performance data are obtained from COMPUSTAT and related to year -1, which is one year before IPO. Offer size is measured as the amount of shares outstanding multiplied by the offer price.

	Offer size	Sales/ assets	Net income/ assets	Cash flow/ assets	Debt/ assets	Sales per share	Earnings per share	Cash flow per share	Debt per share	Growth
Panel A: Total Firms										
Prestigious	855.67	0.7484	-0.5564	-0.5041	0.2982	4.1689	-0.3326	-0.0469	2.5436	5.0598
Non-prestigious	267.02	1.7496	-0.8699	-0.8163	0.398	1.6593	-0.2787	-0.2078	0.5863	3.1492
Difference (t-value)	7.09**	-1.92	2.27*	2.37*	-1.99*	3.29**	-0.752	1.831	5.2**	3.18**
Panel B: Internet firms										
Prestigious	658.22	0.7235	-0.8096	-0.7545	0.2354	0.9971	-0.5024	-0.4157	0.6275	6.6615
Non-prestigious	281.55	1.468	-1.2486	-1.1085	0.4704	0.7106	-0.4096	-0.3554	0.2733	3.705
Difference (t-value)	7.45**	-3.12**	1.86	1.52	-2.81**	0.72	-1.22	-0.91	1.47	3.18**
Panel C: Non-Internet-firms										
Prestigious	1054.93	0.7736	-0.3008	-0.2536	0.3615	7.3843	-0.1613	0.322	4.4772	3.5419
Non-prestigious	251.15	2.0572	-0.4564	-0.4959	0.3172	2.6954	-0.1357	-0.046	0.9355	2.518
Difference (t-value)	5.09**	-1.21	1.23	2.31*	0.9	3.19**	-0.18	2.28*	5.09**	1.36

The differences are based on two-tail tests.
** Significant at 1% level;
* Significant at 5% level;

Three regressions were run with different pre-IPO performance variables as independent variables, since some variables are correlated and cannot be put in one regression. Among the pre-IPO operating performance variables, sales per share and cash flow per share are significantly positive—with coefficients of 0.0542 and 0.1997, respectively. The logarithmic size is significantly positive in every regression—with coefficients exceeding 0.70. These are strong indications that prestigious underwriters tend to choose firms with better performances and larger size than non-prestigious underwriters.

When comparing their coefficients, size contributes the most prominently to the explanation of dependent variables. Unlike Cooper, Dimitrov & Rau's (2001) finding, the Internet dummy variable is not significant and provides evidence that the name of "Internet" is not special when examining their operating performances. Overall, prestigious underwriters consider the pre-IPO operating performance for both Internet and non-Internet firms, even though Internet firms are smaller in size and less profitable compared to non-Internet firms.

Table 5: Probit Regression Results for Prestigious and Non-Prestigious Underwriters

If the underwriter is prestigious with a ranking 9.1, the dependent variable equals 1; otherwise, it equals 0. Sales growth rate, debt to total assets, sales per share, and EPS are pre-IPO financial data. Age refers to the existing years before IPO. Offer size is measured as the offer price times shares outstanding at the initial trading day.

	1		2		3	
Constant	-4.5285	(-8.32)***	-4.0161	(-8.36)***	-4.1011	(-8.16)***
LOG (sales growth rate)	0.1084	-1.39	0.0845	-1.11	0.0977	-1.27
Debt to total assets	-0.1194	(-0.87)				
Sales per share	0.0542	(3.55)***				
Earnings per share			-0.0429	(-0.59)		
Cash flow per share					0.1997	(2.19)**
AGE	-0.0025	(-0.48)	0.0036	-0.76	0.0007	-0.13
LOG (offer size)	0.8206	(8.93)***	0.7459	(8.91)***	0.7649	(8.73)***
Internet dummy	-0.04	(-0.30)	-0.1435	(-1.11)	-0.0683	(-0.52)

*** Significant at 1% level;
** Significant at 5% level;
* Significant at 10% level;

SUMMARY AND CONCLUSIONS

This article has presented an empirical test on the relationship between underwriters' prestige and issuing firms' pre-IPO operating performance during the Internet bubble period, when large numbers of young and small Internet firms with negative earnings and cash flows went public.

Prestigious underwriters did not avoid these firms and actually took about 60 percent of the total IPO market in the years 1999 and 2000.

When dividing the sample into two groups, Internet and non-Internet firms, we find prestigious underwriters show divergent underwriting criteria. Sales growth rate is an important factor for Internet firms, while cash flow per share and sales per share are important for non-Internet firms. Probit regression shows that, overall, prestigious underwriters select larger and more profitable firms as compared to their counterparts.

Why do prestigious underwriters choose large numbers of young and small Internet firms? Several explanations are plausible. First, during these two years studied, 50 percent of total IPOs were Internet firms and 84 percent of those Internet firms had negative cash flows. Prestigious underwriters may not have wanted to lose this large market. Second, in the overconfident bubble period, growth potential outweighed other factors such as earnings or cash flows and most Internet firms were viewed as superior, growing firms. Third, underwriters are compensated not just from issue spreads but also are compensated by the huge initial underpricing. The results of this study confirm that prestigious underwriters underpriced their issuing firms more than non-prestigious underwriters. These underwriting gave them incentives to lower their criteria, which had been stricter in the 1980s and early 1990s.

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