

The Impact of Management Integrity on Audit Planning and Evidence

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ABSTRACT: This study uses archival working paper data from 60 clients of a Big 5 audit firm to directly examine the influence of auditor assessed management integrity on auditor's assessments of misstatement risk, planned audit effort, and audit outcomes. We hypothesize that management integrity is related to preliminary risk assessments, and to the nature, timing and extent of audit procedures. Management integrity not only impacts the auditor's assessment of the risk of financial statement error, it also impacts the auditor's evaluation of source credibility when examining audit evidence provided by management (Beaulieu 2001). Based on this link to evidence, we hypothesize that the integrity assessment influences audit procedures beyond its influence via risk assessments. Finally, given the impact on misstatement risk and audit planning, we expect the auditor assessment of management integrity to be associated with the discovery of client misstatements.

Our findings clearly link the auditor's assessment of management integrity to preliminary risk assessments and the nature, timing and extent of audit evidence gathered. After controlling for preliminary risk assessments, management integrity provides incremental explanatory power in predicting the nature of audit procedures. These results suggest that auditors seek external validation of data when source credibility is suspect. Finally, our findings indicate that management integrity is related to a continuous measure of absolute detected audit differences.

Key Words: Audit Risk Model, Management Integrity, Evidence

1. Introduction

This study uses archival data from 60 audits conducted by a Big 5 accounting firm to examine the association between the external auditor's assessment of management integrity, and the auditor's assessment of misstatement risk, audit planning and the discovery of financial statement misstatements. Prior archival research provides mixed support for the linkage between risk assessments and audit-related judgments (Mock and Wright 1993, 1999). Our study is a more direct test than prior archival studies because we use data taken directly from the working papers, employ a key internal control characteristic (i.e. management integrity) and focus on a combined measure of audit risk.¹ We also go a step further than prior archival research by linking the management integrity assessment through the audit process to the discovery of financial statement misstatements.

Experimental research generally indicates a linkage between risk assessment and audit planning (for an excellent summary see Mock and Wright 1999). Experimental research also suggests auditors adjust their decisions based on evidence concerning management integrity (Beaulieu 2001; Ayers and Kaplan 1998; Schaub 1996). The experimental literature benefits from the direct implementation of the key research constructs. In this paper we implement more direct empirical constructs than prior archival studies in an attempt to triangulate the findings provided by the experimental literature.

The linkage of an auditor's assessment of management integrity to auditor assessed misstatement risk (MR), audit planning and to misstatement detection is important for three reasons. First, management integrity is a key determinant of the client's risk structure. It is at the foundation of internal control. Without management integrity, or the "tone-at-the-top," it is unlikely even the most proficient internal controls will be effective in reducing financial statement error. Hence it is important to evaluate evidence that auditor's incorporate this risk

¹ This combined measure is consistent with the AICPA Exposure Draft - Proposed Statements on Auditing Standards, December 2, 2002.

component into their audit judgments. Second, auditors rely on management to provide a great deal of evidence during the course of the audit. The auditor must carefully evaluate management integrity to assess source credibility relating to client-supplied evidence. We look for evidence that auditors adjust the source of evidence in response to lower management integrity. Finally, the recent enactment of Sarbanes-Oxley and related section 404 requirement that auditors evaluate and report on client internal controls increase the need for us to understand the linkages between management integrity and audit risk and evidence even more important.

Based on the audit risk model we hypothesize that the auditor's assessment of management integrity directly impacts the auditor's assessment of misstatement risk (MR). Misstatement risk is the combination of inherent (IR) and control risk (CR). We do not attempt to separate IR and CR as management integrity is expected to influence both.² After establishing a link between management integrity and MR, we extend further to see if management integrity impacts audit planning. Specifically, we test whether management integrity impacts the nature, timing and extent of audit testing. Management integrity also impacts the reliability of evidence gathered from management which can result in changes in the nature of evidence gathered beyond the impact caused by increased MR. Finally, we extend our analysis to the final audit outcome – the identification of auditor-identified financial statement misstatements. An association between management integrity and misstatement discovery is consistent with both auditors accurately assessing management integrity and the increased MR assessment.

Our findings appear to support our hypotheses. Auditor-assessed management integrity is negatively related to the auditor's MR assessment (i.e. high integrity is related to low risk). The auditor's management integrity assessment is also negatively related to the nature, timing and extent of audit evidence gathered. After controlling for MR, it appears the management integrity assessment incrementally influences the nature of audit evidence. It appears that auditors factor

² It is not uncommon in the literature to combine both IR and CR into a single measure. See Rittenberg and Schwieger (2003) for example.

in the reliability of client supplied evidence by substituting more external evidence when management integrity is low. Finally, we find that the magnitude of errors is higher for clients with low auditor assessed integrity.

The paper proceeds as follows. Section two outlines our hypotheses. Section three describes the data and the empirical tests. Section four provides results and section five summarizes our findings.

2. Hypotheses

We use the audit risk model to link the auditor's assessment of management integrity to MR then link the auditor's MR assessment to the nature, timing and extent of audit procedures. We then hypothesize that the impact of management integrity on the reliability of management supplied evidence leads to an impact on audit planning beyond its impact on MR. Finally, we look at whether the auditor's management integrity assessment associated with the magnitude of audit differences discovered.

2.1 Management integrity and Risk Assessments

The auditors in our study arrive at a management integrity measure by investigating factors relating to management's attitude toward reporting, controls, and the external audit, as well as their reputation in the business community. The firm's guidance states: "Our evaluation [of management integrity and control consciousness] provides an indication of whether management is reliable and reputable, and therefore, whether representations and disclosure may reasonably be expected to be meaningful."³

The Committee of Sponsoring Organizations (COSO) frames the tone-at-the-top as arguably the most important component of an internal control structure (COSO 1999, 1987). Without management's willingness to lead and conduct follow-up procedures to ensure

³ The firm refers to their assessment as management tone. We use the more descriptive management integrity label throughout the paper.

compliance with a strong internal control structure it is unlikely that even the most proficient internal controls will be effective in detecting and preventing financial statement misstatements.

The audit risk model includes consideration of management integrity. Integrity and control consciousness are key attributes to which auditors are attentive (SAS 47, 53, 55, 82, 96). SAS 47 discusses the association between management integrity and IR and CR in more detail. SAS 47 defines inherent risk as the “susceptibility of an assertion to a material misstatement, assuming that there are no related controls.” The assessment of inherent risk considers the client’s operations, industry, the engagement, and characteristics of management. The inherent risk assessment takes management integrity and ethical values into consideration as they pertain to the full and fair disclosure of financial information. When management integrity is assessed as high (i.e. high integrity), then we expect inherent risk to be assessed at a lower level.

SAS 47 defines control risk as “the risk that a material misstatement that could occur in an assertion will not be prevented or detected on a timely basis by internal controls.” Factors considered in the assessment of the internal control environment include the degree of competence of personnel, levels of oversight (i.e. board of directors and audit committee activities), the assignment of authority and responsibility, and management’s commitment to the process of providing accurate financial information.⁴ The control environment promoted by management sets the tone of an organization, influencing the control consciousness of the entity’s employees, and is the foundation for all other components of internal control (AICPA 2000). Therefore, control risk should be negatively related to management integrity.

⁴ Internal control consists of five interrelated components for which management is responsible: the control environment, risk assessment, control activities, information and communication, and monitoring (SAS 78, 1995).

Based on our review of SAS 47, it appears MI should impact both IR and CR.

We examine a combined measure called MR (misstatement risk). This discussion leads to hypothesis one stated in alternative form:

H1: *The auditor's assessment of management integrity will be negatively related to the misstatement risk assessment.*

2.2 *Audit Planning*

The audit risk model is presented below. It is used to direct the auditor's audit planning.

$$AR = MR * DR \quad \text{(ARM model)}$$

Where

AR = Audit Risk – the risk the auditor may unknowingly fail to modify his opinion on financial statements that are materially misstated (AU 312.02).

MR = Misstatement Risk – IR*CR, IR is inherent risk and CR is control risk.

DR = Detection Risk – risk the auditor will not detect a material misstatement.

The ARM (SAS 47) suggests that assessed misstatement risk should directly affect the nature, timing, and extent of audit evidence gathered by the auditor to achieve a desired DR.

Given an assessed MR and a target AR, the auditor plans the nature, timing and extent of audit procedures to achieve the necessary DR. The ARM theoretically guides the selection of audit procedures, producing an effective and efficient risk-focused evidential plan that assists auditors in the opinion formulation process. The auditor's evidential plans respond to broad information sets (e.g., SAS No's. 53-61), however this linkage is not clearly delineated in authoritative guidance.

The auditor changes the nature, timing and extent of evidence gathered to alter the persuasiveness of evidence enabling the auditor to obtain a specified DR. The nature of audit procedures employed relates to the persuasiveness of the evidence required (AICPA 2000). A client with a high MR might require the collection of more independent evidence and more direct observation than a client with a low assessed MR. The timing of evidence collection reflects the auditor's reliance on the client's internal control structure, such that evidence gathered prior to

year-end is expected to reasonably reflect the results and processes in place at year-end. The auditor can use more preliminary procedures when the client has strong internal controls. Finally, the connection between MR and the extent of testing is direct. As MR increases the auditor will need to collect more evidence to achieve a low enough DR to achieve a given level of AR. In summary, we expect management integrity to impact the nature, timing and extent of audit procedures. We test the following hypotheses:

H2 n: *The auditor's assessment of management integrity will be negatively related to the **nature** of audit procedures.*

H2 t: *The auditor's assessment of management integrity will be negatively related to the **timing** of audit procedures.*

H2 e: *The auditor's assessment of management integrity will be negatively related to the **extent** of audit procedures.*

2.3 Source Credibility

We use prior research to argue that the auditor's assessment of management integrity is also an assessment of source credibility for evidence provided by management. The auditor must consider the credibility of management supplied information and adjust the audit plan accordingly when management is deemed to have low credibility. Therefore, client integrity should be related to the confidence placed on management representations (Beaulieu 2001, 1994).

The nature, timing and extent of audit evidence gathered changes when source credibility is perceived to be low (i.e., more evidence that is more persuasive, and gathered at year-end). The auditor's management integrity assessment is a key indicator of source credibility. Schaub (1996) indicates the auditor must trust the client to tell the truth with respect to transactions not investigated. If management integrity is assessed as low, the auditor should increase the quantity and quality of evidence collection, which is consistent with a high misstatement risk assessment.

H2 examines whether management integrity impacts the nature, timing and extent of audit procedures. However, H2 does not consider whether the impact is direct or via the linkage to misstatement risk tested by H1. The effect of the management integrity assessment is

theoretically included in the MR assessment. Given that the management integrity assessment is a significant consideration in the planning phase, we further examine whether MR wholly captures this pertinent planning information. We want to explore whether management integrity has a dual effect on audit testing both through its impact on the auditors' assessment of misstatement risk and through its impact on the credibility of evidence supplied by management. We test the following hypotheses:

H3 n: *The auditor's assessment of management integrity will be negatively related to the **nature** of audit procedures incremental to the misstatement risk assessment.*

H3 t: *The auditor's assessment of management integrity will be negatively related to the **timing** of audit procedures incremental to the misstatement risk assessment.*

H3 e: *The auditor's assessment of management integrity will be negatively related to the **extent** of audit procedures incremental to the misstatement risk assessment.*

2.4 *Misstatements*

We trace the management integrity assessment through the audit process to address our final question – is management integrity associated with the discovery of material misstatements? We expect management integrity to be associated with misstatements for two reasons. First, the assessment of management integrity is designed for the purpose of evaluating the likelihood of misstatements. We expect, accordingly, that there would indeed be more misstatements when the auditor believes management to be of low integrity. Second, as the result of the assessed low management integrity the auditor assesses MR higher, adjusts the audit plan accordingly, and therefore is more likely to find errors. In other words, the auditor is testing more transactions for errors or using more powerful audit tests and as a result finds more errors. The predictions from each of these explanations are the same, potentially compounding the effect. This leads to hypothesis four:

H4: *The auditor's assessment of management integrity will be negatively associated to the **magnitude** of detected misstatements.*

Figure 1 shows the linkages between the assessment of management integrity and risk assessments, the audit plan, and audit outcomes.

3. Proprietary Data, Variable Measurement and Model Specification

3.1 Proprietary Data

The financial statement audit documentation used in this study was acquired from a Big 5 firm.⁵ The firm granted access to its archived audit working paper records for a given practice office that has a primarily technology client base.⁶ Sample audits were selected from the list of archived engagements using a random number generator. The archives contain audit files from 1996 to 1999. The accounting firm provided audit data for 78 audit engagements from 78 different clients. The firm did not evaluate management integrity on 18 of the clients, which resulted in a final sample of 60 clients used in our tests.⁷ Within the sample, 54 clients are publicly traded. The audit firm has been auditing these clients for an average of 7 years. The data set does not contain any first-year audits. All sampled engagements received unqualified opinions, none of the clients in the sample has failed, and there were no restatements or known allegation of audit failure as of 2001. The assurances firm assisted in the coding of variables used in this study, and provided a subsequent multi-level review to facilitate consistent coding of the data.⁸

The data-granting firm considers revenue to be a “significant account.”⁹ Partners of the data-granting firm perceive the revenue portion of the audit to be a more risky audit area, warranting a higher degree of scrutiny. Given these characteristics, revenue is a primary area in

⁵ The big 5 have since consolidated into the big 4. This data is from a firm that is a member of the Big 4.

⁶ As a condition to accessing this data we agreed not to disclose the identity of this firm. We retained all rights to publish our findings without any review or approval from the supplying firm.

⁷ All of the clients included in our sample obtained a detailed control risk assessment evaluation that included an analysis of management integrity. The 18 clients who did not receive a detailed control risk assessment also did not include a management integrity evaluation. There may have been an informal evaluation, but it was not documented in the working papers we examined.

⁸ We did not perform any tests for inter-rater reliability. Instead we relied on the assurances firms help in coding the variables to insure they measure accurately the constructs we examine.

⁹ The data-granting firm considers an account or cycle to be significant if it is critical to the prevention of audit failure, or if its examination will significantly decrease audit firm risk. Several sources corroborate the perceived higher risk of errors and irregularities within the revenue cycle of the audit (e.g., COSO Report 1999).

which risk assessment and related audit testing can vary, and therefore provides a more powerful setting to study management integrity decisions. Assessed risk and audit planning measures are drawn from the revenue cycle audit programs.

3.2 Variable Measurement and Model Specification

To test Hypothesis 1, we employ the following equation:

$$MR_i = \beta_{0i} + \beta_1 MI_i + \beta_2 REV_i + \beta_3 TENURE_i + \beta_4 PUB_i + \beta_5 IND_i + e_i \quad [1]$$

The dependent variable, misstatement risk (MR), is the multiplicative combination of ranked auditor-assessed revenue cycle inherent and control risks (SAS 47). The data-granting firm measures and documents inherent and control risk assessments as “low,” “medium,” or “high.” The risks are coded 1 for low, 2 for medium, or 3 for high. Utilizing a multiplicative combination would result in MR values of 1, 2, 3, 4, 6, and 9.¹⁰ For purposes of interpretation, we use a ranking mechanism to create an MR metric that facilitates the use of OLS as follows:¹¹

		<i>IR</i>		
		Low	Medium	High
<i>CR</i>	Low	1	2	3
	Medium	2	3	4
	High	3	4	5

The test variable, management integrity (MI), is assessed and documented as “strong,” “moderate,” or “weak.” This assessment is coded two for strong, one for moderate, and zero for weak. The data-granting firm’s management integrity assessment is made prior to the assessment of control risk and inherent risk. The assessment attempts to capture management’s integrity and control consciousness. Auditors arrive at a management integrity measure by investigating factors related to management’s attitude toward reporting, controls, and the external audit, as well as their reputation in the business community. The data-granting firm’s guidance states “the

¹⁰ The multiplicative MR metric is not measured on a continuous scale, thus it would seem that multinomial logit would be a more fitting methodology. However, the marginal effects of the regressors on the probabilities are not equal to the coefficients, rendering coefficient interpretation to be difficult, and the model will fail to account for the ordinal nature of the dependent variable (Greene 1997).

¹¹ We thank William Waller and Mark Zimbelman for suggesting the combination approach.

reputation, character, and integrity of senior management and the tone set for the overall control environment provides us with an indication of whether they are responsible and reputable, and whether meaningful representations and full disclosure can be reasonably expected during the engagement.” Where MR is the dependent variable, we expect the coefficient on MI to be negative, indicating that higher integrity assessments contribute to a lower preliminary risk assessment.

We include several controls to mitigate the potential for a correlated omitted variable problem. Prior literature has noted that the length of the auditor-client relationship may affect risk assessments due to learning over time (O’Keefe, Simunic and Stein 1994; Ashton 1991). We control for this by including the number of years the auditor has been auditing the client (TENURE). As a result of the potential for learning over time, we expect the coefficient on TENURE to obtain a negative coefficient.

To control for client size, we include the natural log of total client revenue (REV) for the year under audit. Risk and audit effort measures used in this study are revenue cycle-specific, rendering the inclusion of REV to be a fitting size control. While larger firms (firms with more revenue) may have greater oversight, leading to potentially lower control risk assessments, they may have more complex control structures and greater decentralization, potentially increasing CR. Prior literature has shown that the relationship between auditor effort and client size is nonlinear (O’Keefe et al 1994). To address this issue, we utilize the natural log of revenue. It is unclear how these effects will aggregate and affect the MR - REV relationship. Accordingly, we do not have an expectation of the sign on REV.

Prior research suggests the auditor is more likely to be sued if the client is publicly held (e.g., St. Pierre and Anderson 1982). Additionally, incentives to overstate financial standing and results of operations are suggested to be greater for managers of public firms due to (partially) market driven compensation (O’Keefe et al 1994). We control for this by including an indicator

variable (PUB) that takes on a value of 1 for firms that are publicly traded. We expect PUB to obtain a positive association with MR.

To control for potential systematic differences in the manner in which audits were conducted between industry groups as identified by the data-granting firm, we include an indicator variable representing the two industry categories in our sample (IND). Because we do not have any evidence concerning major changes in audit approach by the data-granting firm between industry groups, there is no expectation for the coefficient on IND.

An auditor may address specific client characteristics by adjusting the evidential plan. This can be accomplished by altering the nature of evidence collected, the timing of evidence collection, and the extent of audit procedures conducted. To test Hypothesis 2 we examine independent equations for each of these effort measures in the following form using OLS:¹²

$$\text{NATURE}_i = \beta_{0i} + \beta_1 \text{MI}_i + \beta_2 \text{REV}_i + \beta_3 \text{TENURE}_i + \beta_4 \text{PUB}_i + \beta_5 \text{IND}_i + e_i \quad [2]$$

$$\text{TIMING}_i = \beta_{0i} + \beta_1 \text{MI}_i + \beta_2 \text{REV}_i + \beta_3 \text{TENURE}_i + \beta_4 \text{PUB}_i + \beta_5 \text{IND}_i + e_i \quad [3]$$

$$\text{EXTENT}_i = \beta_{0i} + \beta_1 \text{MI}_i + \beta_2 \text{REV}_i + \beta_3 \text{TENURE}_i + \beta_4 \text{PUB}_i + \beta_5 \text{IND}_i + e_i \quad [4]$$

The dependent variable NATURE is measured using the following classes of evidence validity and persuasiveness: outside, outside/inside, and inside. We categorize audit procedures listed in the revenue cycle of the audit program using a three-point scale (outside evidence equals 3, outside/inside equals 2, and inside equals 1). “Outside” evidence is obtained, inspected, or observed completely independent of management. This is considered to be the strongest form of evidence. An example of outside evidence is a cash confirmation sent directly from a bank to the auditor. “Outside/inside” evidence originated from a third party outside of the influence of management but has the potential to be manipulated by management. An example of outside/inside evidence is a bank statement sent by the bank to the client. This bank statement

¹² Because client characteristics may simultaneously affect each dependent variable, the residuals from these three regressions may also be correlated, implying that Seemingly Unrelated Regression (SUR) should be utilized to improve the efficiency of the coefficient estimation. However, the SUR estimator reduces to OLS when the independent variables are identical for all equations (Amemiya [1985, p. 187]).

originated from the bank but passed through the hands of the client, and thus had the potential to be manipulated by the client. “Inside” evidence is obtained directly from the client. An example is a bank reconciliation prepared by the client. NATURE is the average of these rankings for all procedures listed in the revenue cycle audit program. Where NATURE is the dependent variable, we expect the coefficient on MI to obtain a negative value, indicating the auditor requires less persuasive evidence in the presence of strong management integrity.

The dependent variable TIMING equals the proportion of substantive testing hours conducted at the client’s fiscal year-end relative to total audit substantive testing.¹³ Total substantive testing includes interim work as well as joint tests conducted during internal controls evaluation. If, for a given audit, 60 percent of substantive hours were conducted at the client’s fiscal year-end, and 40 percent during interim work, then the observation receives a TIMING score of 60. When TIMING is a dependent variable, we expect the coefficient on MI to obtain a negative value, indicating the auditor requires less evidence collected at year-end in the presence of strong management integrity.

The dependent variable EXTENT equals total revenue cycle audit hours. When EXTENT is a dependent variable, we expect the coefficient on MI to obtain a negative value, indicating the audit requires less evidential effort in the presence of strong management integrity.

To test Hypothesis 3, we examine the impact of MI incremental to MR on nature, timing, and extent independently by employing OLS analysis in the following form:

$$\text{NATURE}_i = \beta_{0i} + \beta_1\text{MI}_i + \beta_2\text{MR}_i + \beta_3\text{REV}_i + \beta_4\text{TENURE}_i + \beta_5\text{PUB}_i + \beta_6\text{IND}_i + e_i \quad [5]$$

$$\text{TIMING}_i = \beta_{0i} + \beta_1\text{MI}_i + \beta_2\text{MR}_i + \beta_3\text{REV}_i + \beta_4\text{TENURE}_i + \beta_5\text{PUB}_i + \beta_6\text{IND}_i + e_i \quad [6]$$

$$\text{EXTENT}_i = \beta_{0i} + \beta_1\text{MI}_i + \beta_2\text{MR}_i + \beta_3\text{REV}_i + \beta_4\text{TENURE}_i + \beta_5\text{PUB}_i + \beta_6\text{IND}_i + e_i \quad [7]$$

Similar to Hypothesis 2, we expect a negative coefficient on MI in all three regressions.

To test Hypothesis 4, we employ OLS regressions in the following form:

¹³ The data set does not contain audits that changed the proximity of the year-end engagement relative to the client’s fiscal year-end.

$$\text{DIFFS}_i = \beta_{0i} + \beta_1 \text{MI}_i + \beta_2 \text{MR}_i + \beta_3 \text{REV}_i + \beta_4 \text{TENURE}_i + \beta_5 \text{PUB}_i + \beta_6 \text{IND}_i + e_i \quad [8]$$

$$\text{DIFFS}_i = \beta_{0i} + \beta_1 \text{MI}_i + \beta_2 \text{MR}_i + \beta_3 \text{REV}_i + \beta_4 \text{TENURE}_i + \beta_5 \text{PUB}_i + \beta_6 \text{IND}_i + \beta_7 \text{EXTENT}_i + e_i \quad [9]$$

The dependent variable DIFFS is the absolute value of total dollar amount of audit differences discovered by the auditors during the evidential process. The DIFFS measure is for revenue cycle related audit differences only. These audit differences represent potential misstatements that should be adjusted or investigated further, not necessarily errors in the financial statements. These were the actual differences the auditor discussed with client management. When DIFFS is a dependent variable, we expect the coefficient on MI to obtain a negative value, suggesting that a weak MI assessment is associated with more audit differences.

4. Results

4.1 Descriptive Statistics

Table 1 provides descriptive statistics on our dependent and independent variables. Mean MI is 1.40 suggesting auditors assessed their clients in our sample to have high integrity. This result is consistent with findings from the client acceptance literature that suggests auditors screen out very high risk clients (Johnstone and Bedard 2003). The mean MR of 1.5 also suggests that auditors assessed the misstatement risk of these clients as low.

The mean of Nature (1.62) suggests that on average auditors sought information from a mix of internal and external sources, but relied more heavily on internal sources. On average a majority of the procedures were performed at year-end as suggested by the mean of Timing (79.67). Auditors identified an average of 180,973 in audit differences, but over half the clients did not have any audit differences.

Table 2 presents the correlation between all the variables. The significant correlation between MI and MR supports H1. The significant correlation between MI and Nature and Timing support H2n and H2t, but there is no correlation between MI and Extent suggesting no evidence to support H2e. Interestingly, the correlations between either Nature or Timing and

Extent are also weak. Finally, as expected the negative correlation between MI and Diff supports H4.

4.2 *Management integrity and Auditor Effort*

Table 3 presents OLS regression results for Equation 1 through 4. In equation 1, MI (-0.5066, $p=0.0005$) is significant with MR as a dependent variable. This result supports H1. It indicates that strong management integrity is related to lower preliminary audit risk assessments. Equations 2-4 indicate that MI is significantly, negatively related to NATURE (-0.2358, $p<0.0001$), TIMING (-4.9268, $p=0.0037$), and EXTENT (-40.6237, $p=0.0309$). This evidence supports the hypotheses that the management integrity assessment is a significant consideration in audit planning decisions. Specifically these results indicate that when the client is assessed to have high management integrity the auditor requires less persuasive evidence (H2 n), less year-end evidence (H2 t), and less *overall* evidence (H2 e).¹⁴

Table 4 presents OLS results examining H3. When NATURE is the dependent variable MI is significantly negative (-0.1114, $p=0.0061$), however when TIMING (-1.7252, $p=0.1566$) and EXTENT (-11.1973, $p=0.3056$) are the dependent variables the coefficient on MI is not significant. This finding indicates that when MI is strong the auditor relies more on management supplied evidence, and conversely when MI is weak the auditor does not rely on management supplied evidence. The auditor responds to low MI by varying the *nature* of audit tests requiring more independent (persuasive) evidence. Due to the source credibility issue, the auditor makes a change in the audit program that will increase the cost of the audit (i.e. more independent information is generally more costly to collect) by going outside the client for data verification instead of simply increasing the analysis of the clients information.

¹⁴ VIFs are well below 10 in all of our regression analysis. Marquandt (1980) argues that a multicollinearity problem exists if VIF values exceed 10. Equations 1-4 were also run including two additional control variables YR (the year of the observation) and ROA (return on assets included as a profitability measure). The results are robust to the inclusion of these variables. The variables are not significant in the regressions and therefore are not included in the primary analysis.

4.2 *Management integrity and Audit Differences*

Table 5 presents OLS regression results testing H4. The coefficient on MI is significant and negative in Equation 8 (-471,415, $p < 0.0001$) providing evidence indicating that MI is associated with the magnitude of audit differences discovered. As discussed earlier this finding may be the by-product of more diligent testing for low integrity assessments, so we attempt to control for the extent of testing to isolate the relationship between error discovery and integrity assessments. Equation 9 includes EXTENT scaled by total revenue as an independent variable to control for the potential effect of increased audit effort on error discovery. This variable goes beyond a simple size measure, and captures testing intensity per dollar unit. In this equation MI is still significant (-479072, $p < 0.0001$).

4.3 *Sensitivity Analysis*

We examine the sensitivity of our results to 1) our use of a combined risk measure, 2) the use of a different metric for Nature, 3) a scaled measure of Extent, and 4) a scaled measure of audit differences.

Misstatement Risk (MR) used in the prior tests is a combination of both Inherent Risk (IR) and Control Risk (CR). We rerun all of our empirical tests separately using each of these risk measures in place of MR. For tests of H1, and H2 the results are consistent with those presented in Table 6 with either measure of risk included in the model instead of MR.

However, results differ for tests of H3 when CR is used instead of MR as a control variable in the preliminary risk assessment equations. MI (-3.1012, $p < 0.0336$) becomes significant in the Timing regression (see Table 6) with CR instead of MR included in the model. We hypothesize that MI acts as a proxy for IR, and subsequently provides additional explanatory power beyond CR in this regression. When IR is used as the risk control variable MI returns to the insignificant levels previously documented in our test of H3t.

Mock and Wright (1993, 1999) use the Number of Tests conducted as a measure of Nature. When we use this measure we obtain results that are similar to our tests of H2n

documented in Table 3, but differ from those presented in Table 4 in tests of H3 n. Consistent with H2n, when a MR is not included in the regression, Table 6 shows MI is significant (-0.9679, $p < 0.0277$). However, when MR is included as a control variable, MI is insignificant (-0.6261, $p < 0.1065$) in contrast to our early test of H3n.¹⁵ It appears that this difference is because the Number of Tests measure is a better proxy for the extent of procedures rather than the nature of procedures. In support of this conjecture, both Tables 3 and 4 show that when our measure of nature was the dependent variable the size control variable (REV) was insignificant, but REV obtains significance in the Number of Tests specification of nature in Table 6 (1.5440, $p < 0.0001$). In Table 6 we also show the results of the Extent regression to demonstrate the similarities in the results between the Extent and Number of Tests measures. We point to the high correlation between the Number of Tests and the Extent (0.73) measures and also with REV (0.43). In sum it appears the Number of Tests measure is a better indicator of Extent than it is of Nature.

We also tested a metric of audit testing intensity by scaling the Extent measure by total revenue. In its scaled form, this variable captures testing intensity per dollar of revenue. This provides us with a variable that still represents the extent of testing, without having a direct size effect. The results presented in Tables 3, 4 and 5 are consistent with those found using this audit testing intensity measure for extent.

When the dependent variable DIFF is scaled by total revenue, the results are consistent with those presented in Table 5. Further, when different risk measures are used as controls with the scaled DIFF the results are still consistent with Table 5.

5. Summary and Conclusions

In light of recent management induced business failures (e.g., Enron) and the impending Sarbanes- Oxley related section 404 requirement that auditors certify internal controls, the importance of recognizing and considering the integrity of client management has taken on new

¹⁵ The result presented in the table uses CR as the risk measure, however the combined risk measure and IR both provide similar results.

importance. This study examines the influence of the auditor's assessment of management integrity on preliminary risk assessments and the allocation of audit effort. Our findings suggest that clients with higher assessed levels of integrity have lower preliminary risk assessments. This finding indicates the management integrity assessment represents a viable auditor consideration. Our findings also indicate that management integrity is related to audit planning on the allocation of audit effort as measured by the nature, timing and extent of audit evidence collected. Because this result may be due to the relationship between assessed risk and audit effort delineated in the ARM, we control for preliminary risk assessments. Management integrity exhibits incremental explanatory power beyond MR for the nature of audit evidence collected. This result indicates that when the client's information is not trustworthy the auditor seeks external validation of the data, not continued scrutiny of the client prepared data. It also suggests that prescribed risk assessments may not fully capture information utilized by the auditor in making planning decisions.

Prior literature has not examined the direct linkage between client characteristics and audit differences discovered in the course of the audit. This study examines the effectiveness of the management integrity assessment as an indicator of documented audit differences. Our results indicate that after controlling for overall audit effort, management integrity, when assessed high, is related to a lower magnitude of discovered audit differences.

The results of this study also have implications to future research regarding the relationship between client characteristics and audit effort. This relationship in current practice follows the guidelines in the ARM. This study indicates the prescribed risk assessments in this model do not fully capture all client characteristics considered by the auditor. Future research may look into a more disaggregated form of the ARM that utilizes management integrity measures similar to those presented in this study. Perhaps the role of preliminary risk assessments has become too broad. The aggregation of client risks in the current ARM may mitigate its usefulness. The results of this study would seem to suggest that preliminary risk

assessments are one of the inputs that should be considered in audit decisions; however the set of inputs use for nature, timing and extent decisions may not be the same.

The nature of the data utilized in this study brings with it certain limitations for generalizability of the results. The data was drawn from a single big five firm's practice office that audits predominantly technology-oriented clients. The measurement utilized for NATURE is unique to this study. However, we feel this measure more accurately captures the true nature of audit evidence as compared to measures used in prior literature.

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Figure 1
Linkages between Assessed Management Integrity through to Audit Outcome

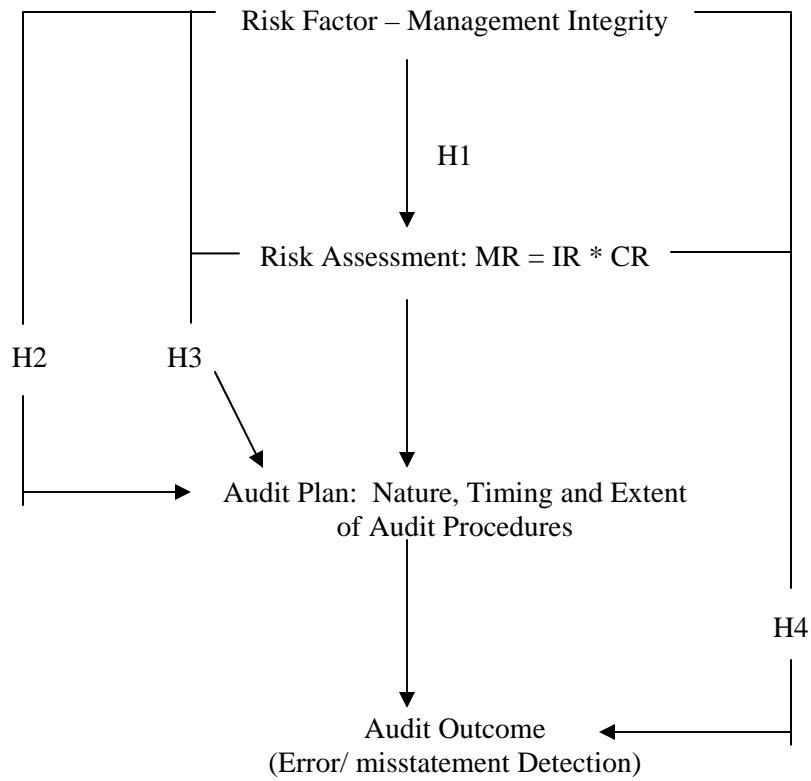


Table 1
Descriptive Statistics
N=60

Panel A: Descriptive Statistics:

	MEAN	STANDARD DEVIATION	QUARTILE		QUARTILE
			#1	MEDIAN	#2
MI	1.40	0.74	1	2	2
MR	1.50	0.89	1	1	2
NATURE	1.62	0.32	1.40	1.54	1.93
TIMING	79.67	13.94	70	80	90
EXTENT	85.93	125.53	18	33	77
DIFF	180,973	550,854	0	0	35,000
REV	17.92	1.95	16.31	17.81	18.99
TOTALREV	441,124,554	1,186,191,750	12,167,500	54,557,000	177,326,538
TENURE	6.85	4.30	4	6	8
PUB	0.90	0.30	1	1	1
IND	0.63	0.49	0	1	1

MI is an auditor assessment of management's integrity and commitment to full and fair disclosure of financial information measured on a three level categorical scale where MI takes on a value of 2, 1, or 0, where 2 represents high levels of integrity. Misstatement Risk (MR) is a metric measured on a scale from 1-5 where 1 is low risk and 5 is high risk (see section 3.2). NATURE is the average persuasiveness score given to audit procedures in the revenue cycle (the persuasiveness score is given on a three level scale: 3 for outside information, 2 for outside/inside information, and 1 for inside information). TIMING is the percentage of substantive tests conducted at the end of the fiscal year of the client. EXTENT is the total hours spent performing test of controls and substantive testing in the revenue cycle during the audit. DIFF is the sum of documented audit differences within the audit work papers. The control variables are: natural log of revenue (REV), public or private ownership (PUB), and industry categorization (IND). TOTALREV is total revenue, and is included for descriptive purposes only.

Table 2
Spearman Correlations
N=60

	MI	MR	NATURE	TIMING	EXTENT	logREV	REV	TENURE	PUB	IND	DIFF
MgtTONE	1.00000	-0.59614 <.0001	-0.57299 <.0001	-0.57246 <.0001	-0.00177 0.9893	0.43382 0.0005	0.43382 0.0005	0.37307 0.0033	0.22010 0.0911	0.14036 0.2848	-0.74711 <.0001
MR	-0.59614 <.0001	1.00000	0.74954 <.0001	0.75005 <.0001	0.15977 0.2227	-0.50866 <.0001	-0.50866 <.0001	-0.48597 <.0001	-0.08277 0.5295	-0.14943 0.2545	0.44488 0.0004
NATURE	-0.57299 <.0001	0.74954 <.0001	1.00000	0.56618 <.0001	0.22045 0.0905	-0.32717 0.0107	-0.32717 0.0107	-0.46954 0.0002	-0.03216 0.8073	-0.06107 0.6430	0.37023 0.0036
TIMING	-0.57246 <.0001	0.75005 <.0001	0.56618 <.0001	1.00000	-0.23055 0.0764	-0.70181 <.0001	-0.70181 <.0001	-0.68166 <.0001	-0.14999 0.2527	-0.30022 0.0198	0.24295 0.0614
EXTENT	-0.00177 0.9893	0.15977 0.2227	0.22045 0.0905	-0.23055 0.0764	1.00000	0.60307 <.0001	0.60307 <.0001	0.31012 0.0159	0.30972 0.0160	0.35965 0.0048	0.18197 0.1641
REV	0.43382 0.0005	-0.50866 <.0001	-0.32717 0.0107	-0.70181 <.0001	0.60307 <.0001	1.00000	1.00000 <.0001	0.60320 <.0001	0.30475 0.0179	0.52124 <.0001	-0.19198 0.1417
TOTALREV	0.43382 0.0005	-0.50866 <.0001	-0.32717 0.0107	-0.70181 <.0001	0.60307 <.0001	1.00000 <.0001	1.00000 <.0001	0.60320 <.0001	0.30475 0.0179	0.52124 <.0001	-0.19198 0.1417
TENURE	0.37307 0.0033	-0.48597 <.0001	-0.46954 0.0002	-0.68166 <.0001	0.31012 0.0159	0.60320 <.0001	0.60320 <.0001	1.00000	0.10390 0.4295	0.29007 0.0246	-0.16219 0.2157
PUBLIC	0.22010 0.0911	-0.08277 0.5295	-0.03216 0.8073	-0.14999 0.2527	0.30972 0.0160	0.30475 0.0179	0.30475 0.0179	0.10390 0.4295	1.00000	0.09223 0.4834	-0.23324 0.0729
IND	0.14036 0.2848	-0.14943 0.2545	-0.06107 0.6430	-0.30022 0.0198	0.35965 0.0048	0.52124 <.0001	0.52124 <.0001	0.29007 0.0246	0.09223 0.4834	1.00000	0.00000 1.0000
DIFF	-0.74711 <.0001	0.44488 0.0004	0.37023 0.0036	0.24295 0.0614	0.18197 0.1641	-0.19198 0.1417	-0.19198 0.1417	-0.16219 0.2157	-0.23324 0.0729	0.00000 1.0000	1.00000

Table 3

OLS Regression Analysis

Test of H1:	$MR_i = MI_i + REV_i + TENURE_i + PUB_i + IND_i + e_i$	[1]
Test of H2 n:	$NATURE_i = MI_i + REV_i + TENURE_i + PUB_i + IND_i + e_i$	[2]
Test of H2 t:	$TIMING_i = MI_i + REV_i + TENURE_i + PUB_i + IND_i + e_i$	[3]
Test of H2 e:	$EXTENT_i = MI_i + REV_i + TENURE_i + PUB_i + IND_i + e_i$	[4]

Dependent Variables

Independent Variables and Expected Signs	Misstatement Risk	Nature	Timing	Extent
Intercept	4.7026#### <0.0001	2.1370#### <0.0001	146.0382 #### <0.0001	-609.1080#### 0.0001
MI -	-0.5066*** 0.0005	-0.2358*** <0.0001	-4.9268*** 0.0037	-40.6237** 0.0309
REV ?	-0.1501## 0.0268	-0.0143 0.5515	-3.0949#### 0.0003	42.7537#### <0.0001
TENURE -	-0.0234 0.1782	-0.0132* 0.0773	-1.1715*** 0.0002	-6.5552** 0.0417
PUB +	0.2332 0.2402	0.1463 0.1116	3.5409 0.1912	22.7945 0.3198
IND ?	0.2336 0.3011	0.0512 0.5295	1.3238 0.6310	15.7203 0.6357
Adjusted R-squared	35.54%	34.93%	60.38%	29.13%

The dependent variables included in this table are defined as follows: Misstatement Risk (MR) is a metric measured on a scale from 1-5 where 1 is low risk and 5 is high risk (see section 3.2), NATURE is the average persuasiveness score given to audit procedures in the revenue cycle (the persuasiveness score is given on a three level scale: 3 for outside information, 2 for outside/inside information, and 1 for inside information), TIMING is the percentage of substantive tests conducted at the end of the fiscal year of the client, EXTENT is the total hours spent performing test of controls and substantive testing in the revenue cycle during the audit. The experimental variable, MI, is an auditor assessment of management's integrity and commitment to full and fair disclosure of financial information measured on a three level categorical scale where MI takes on a value of 2, 1, or 0, where 2 represents high levels of integrity. The control variables include: the natural log of revenue (REV), public or private ownership (PUB), and industry categorization (IND).

Statistical significance for parameter estimates are indicated at the 1% (***), 5% (**) and 10% (*) levels for one-tailed tests, and 1% (####), 5% (##) and 10% (#) levels for two-tailed tests.

Table 4

OLS Regression Analysis

Test of H3 n:	$NATURE_i = MI_i + MR_i + REV_i + TENURE_i + PUB_i + IND_i + e_i$	[5]
Test of H3 t:	$TIMING_i = MI_i + MR_i + REV_i + TENURE_i + PUB_i + IND_i + e_i$	[6]
Test of H3 e:	$EXTENT_i = MI_i + MR_i + REV_i + TENURE_i + PUB_i + IND_i + e_i$	[7]

Dependent Variables

Independent Variables and Expected Signs	Nature	Timing	Extent
Intercept	0.9817### 0.0031	116.3162### <0.0001	-882.2908### <0.0001
MI -	-0.1114** 0.0061	-1.7252 0.1566	-11.1973 0.3056
MR +	0.2457*** <0.0001	6.3203*** <0.0001	58.0917*** 0.0015
REV ?	0.0226 0.2278	-2.1461### 0.0049	51.4739### <0.0001
TENURE -	-0.0074 0.1409	-1.0233*** 0.0002	-5.1934* 0.0705
PUB +	0.0890 0.1908	2.06693 0.2782	9.2470 0.4192
IND ?	-0.0062 0.9195	-0.1526 0.9494	2.1504 0.9448
Adjusted R squared	64.26%	70.38%	39.00%

The dependent variables included in this table are: NATURE-the average persuasiveness score given to audit procedures in the revenue cycle (the persuasiveness score is given on a three level scale: 3 for outside information, 2 for outside/inside information, and 1 for inside information), TIMING-the percentage of substantive tests conducted at the end of the fiscal year of the client, EXTENT is the total hours spent performing test of controls and substantive testing in the revenue cycle during the audit. The experimental variable, MI, is an auditor assessment of management's integrity and commitment to full and fair disclosure of financial information measured on a three level categorical scale where MI takes on a value of 2, 1, or 0, where 2 represents high levels of integrity. The control variables include: the natural log of revenue (REV), tenure as auditor (TENURE), public or private ownership (PUB), and industry categorization (IND). Misstatement Risk (MR) is a metric measured on a scale from 1-5 where 1 is low risk and 5 is high risk (see section 3.2).

Statistical significance for parameter estimates are indicated at the 1% (***), 5% (**) and 10% (*) levels for one-tailed tests, and 1% (###), 5% (##) and 10% (#) levels for two-tailed tests.

Table 5

OLS Regression Analysis

$$\text{Tests of H4: } \text{DIFF}_i = \text{MI}_i + \text{MR}_i + \text{REV}_i + \text{TENURE}_i + \text{PUB}_i + \text{IND}_i + e_i \quad [8]$$

$$\text{DIFF}_i = \text{MI}_i + \text{MR}_i + \text{REV}_i + \text{TENURE}_i + \text{PUB}_i + \text{IND}_i + \text{EXTENT}_i + e_i \quad [9]$$

Dependent Variable

Independent Variables and Expected Signs	Documented Audit Differences	
Intercept	301588 <i>0.7159</i>	-301814 <i>0.7707</i>
MI -	-471415*** <0.0001	-479072*** <0.0001
MR +	-189691* <i>0.0507</i>	-149962* <i>0.0762</i>
REV ?	33147 <i>0.4938</i>	68350 <i>0.1304</i>
TENURE -	14013 <i>0.4322</i>	10461 <i>0.2827</i>
PUB +	120308 <i>0.6028</i>	126633 <i>0.2922</i>
IND ?	40234 <i>0.7994</i>	41704 <i>0.7923</i>
EXTENT ?		-683.904 <i>0.3331</i>
Adjusted R squared	17.79%	17.72%

The dependent variable (DIFF) is the sum of documented audit differences within the audit work papers. The experimental variable, MI, is an auditor assessment of management's integrity and commitment to full and fair disclosure of financial information measured on a three level categorical scale where MI takes on a value of 2, 1, or 0, where 2 represents high levels of integrity. The control variables include: the natural log of revenue (REV), tenure as auditor (TENURE), public or private ownership (PUB), and industry categorization (IND). Misstatement Risk (MR) is a metric measured on a scale from 1-5 where 1 is low risk and 5 is high risk (see section 3.2), and EXTENT is the total hours spent performing test of controls and substantive testing in the revenue cycle during the audit.

Statistical significance for parameter estimates are indicated at the 1% (***), 5% (**) and 10% (*) levels for one-tailed tests, and 1% (###), 5% (##) and 10% (#) levels for two-tailed tests.

Table 6

Sensitivity Analysis

Test of H2 n:	$\text{NofTests}_i = \text{MI}_i + \text{REV}_i + \text{TENURE}_i + \text{PUB}_i + \text{IND}_i + e_i$
Test of H3 n:	$\text{NofTests}_i = \text{MI}_i + \text{CR}_i + \text{REV}_i + \text{TENURE}_i + \text{PUB}_i + \text{IND}_i + e_i$
Test of H3 t:	$\text{TIMING}_i = \text{MI}_i + \text{CR}_i + \text{REV}_i + \text{TENURE}_i + \text{PUB}_i + \text{IND}_i + e_i$
Test of H3 e:	$\text{EXTENT}_i = \text{MI}_i + \text{CR}_i + \text{REV}_i + \text{TENURE}_i + \text{PUB}_i + \text{IND}_i + e_i$

Dependent Variables

Independent Variables and Expected Signs		Timing	Number of Tests	Number of Tests	Extent
Intercept		117.5256 ### <0.0001	-16.3486### <0.0001	-21.6884### <0.0001	-936.1120### <0.0001
MI	-	-3.1012** 0.0336	-0.9679** 0.0277	-0.6261 0.1065	-19.6863 0.1675
CR	-	11.2606*** 0.0002		2.1089** 0.0113	129.1453*** 0.0009
REV	?	-2.3714### 0.0026	1.4085### <0.0001	1.5440### <0.0001	51.0514### <0.0001
TENURE	-	-1.0587*** 0.0002	-0.2006** 0.0119	-0.1795** 0.0179	-5.2620* 0.0636
PUB	+	2.6337 0.2347	1.1725 0.1506	1.0026 0.1791	12.3897 0.3898
IND	?	0.5652 0.8197	0.9624 0.2143	0.8203 0.2715	7.0196 0.8163
Adjusted R-squared		68.11%	51.67%	55.40%	41.55%

The dependent variables included in this table are: NATURE-the average persuasiveness score given to audit procedures in the revenue cycle (the persuasiveness score is given on a three level scale: 3 for outside information, 2 for outside/inside information, and 1 for inside information), TIMING-the percentage of substantive tests conducted at the end of the fiscal year of the client, EXTENT is the total hours spent performing test of controls and substantive testing in the revenue cycle during the audit. The experimental variable, MI, is an auditor assessment of management's integrity and commitment to full and fair disclosure of financial information measured on a three level categorical scale where MI takes on a value of 2, 1, or 0, where 2 represents high levels of integrity. The control variables include: the natural log of revenue (REV), tenure as auditor (TENURE), public or private ownership (PUB), and industry categorization (IND). Misstatement Risk (MR) is a metric measured on a scale from 1-5 where 1 is low risk and 5 is high risk (see section 3.2).

Statistical significance for parameter estimates are indicated at the 1% (***), 5% (**) and 10% (*) levels for one-tailed tests, and 1% (###), 5% (##) and 10% (#) levels for two-tailed tests.