

Internal Control Weakness, Remediation Failure, and Audit Opinions: Evidence from the US Listed Firms

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Abstract: This study investigates the impact of internal control weakness and failure of remediation on audit opinions in the US-listed firms under the Sarbanes-Oxley Act (SOX) Section 404. The analysis is based on the US non-financial listed firms for the period 2010-2018. The data were analysed using logit regressions and a propensity score matching method. The results of this study document that firms with internal control weaknesses disclosed are more likely to be issued modified audit opinions. Similarly, last year's modified audit opinion or going-concern opinion also contributes to receiving modified audit opinion in the current year. Furthermore, firms that failed to remediate the previous year's internal control weakness are more exposed to getting a modified audit opinion. However, there is no evidence that suggests successful remediation of the prior year's internal control weakness contributes to reducing the likelihood of receiving a modified audit opinion in the current year. The finding of this study is important as the negative impact of internal control weaknesses and unremedied weaknesses are of interest to firms, regulators, auditors, and users of financial statements in making informed risk management and investment decisions.

Keywords: Internal control weakness; remediation failure; remediation success; audit opinion; US; Sarbanes-Oxley Act Section 404.

1. INTRODUCTION

The accounting scandal in the early 2000s led to a crisis of confidence in the financial market as investors found it hard to trust the outcome of a company's financial reporting process (Nanda, 2003). The Sarbanes-Oxley Act (SOX) was passed in 2002 for restoring investors' confidence in the financial reporting system and to protect shareholders from fraudulent financial reporting. The SOX significantly changed the legal and regulatory audit environment (Czerney *et al.*, 2014). In the post-SOX era, external auditors take greater risks when auditing listed firms, as they face significant legal consequences for any violation of SOX. Section 404 of the Act requires auditors to report on a firm's assessment of the effectiveness of its internal control system that is designed to prevent or detect errors or frauds that may lead to material misstatement of the financial statements. Auditors are better able to evaluate the risk of material misstatements, as they gain greater insights into their client's operations and internal controls over the financial reporting process.

The board of directors, the audit committee and the internal audit function represent the internal monitoring mechanism within a company, whereas the external auditors serve as an

external monitoring mechanism providing independent verification of the quality of a company's financial reporting (Kharuddin and Basioudis, 2022). A high-quality internal control system is considered an effective process to support corporate governance (Leung *et al.*, 2006; Qamhan *et al.*, 2018; Farazdaghi *et al.*, 2020). It is essential to have in place a strong system of internal controls to constrain the manipulation of financial information and ensure high-quality financial reporting. The reliability of financial reports is one of the main objectives of an adequate internal control system that is expected to provide reasonable assurance that financial reports are accurate and reliable. In other words, a strong internal control system can improve the transparency and reliability of financial reports (Doyle *et al.*, 2007). An effective internal control system should prevent any potential errors, mistakes, or fraud that may occur during the preparation of financial reports. Empirical evidence stresses that there is a positive relationship between the quality of internal control and the quality of financial information and that effective internal control improves the quality of financial reporting (Doyle *et al.*, 2007; Ashbaugh-Skaife *et al.*, 2008). Also, prior studies on corporate governance suggest that the quality of the internal control system is linked to lowering audit fees. This is because the external auditor takes into consideration that firms with adequate internal control systems will have a lower audit risk. Hence, external audits are part of a corporate governance structure that serves as monitoring tools by ensuring the reliability of financial statements, constraining opportunistic earnings management and reducing

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agency conflict between management, and shareholders (Habib, 2013).

Since the SOX has made substantial improvements in controlling the risk level of a firm's internal control system, auditors can take candidly a more cautious response, including raising audit fees and issuing modified opinions and resignations (Elder *et al.*, 2009). Auditors are conscious when they issue a qualified or unqualified audit opinion because their audit opinions reflect the auditor's assessment of whether the financial statements have material misstatement or not. The modified opinions (e.g. qualified reports, adverse reports, disclaimer of opinion reports, or unqualified reports with explanatory paragraphs) also remind the users of the financial statements regarding the impending problems in the financial reports (DeFond *et al.*, 2000). On the other hand, the modified opinion can protect the auditor from litigation damages (Kaplan and Williams, 2012; Chen and Chen, 2019).

For listed firms, the identification of internal control weaknesses (ICWs) and their remediation are important issues that all firms must pay attention to since they are of great significance to firms in improving the internal governance environment. Dashtbayaz *et al.* (2022) document significant positive effect of internal control weakness on different types of auditor opinions in both fraudulent and non-fraudulent firms. The remediation of internal control weaknesses is necessary because many practices have proved that it can improve the reliability of financial reports and then enhance investor confidence by sending out more reliable signals of financial statements (Ashbaugh-Skaife *et al.*, 2007). Firms may suffer adverse consequences for non-remediation of previously disclosed material weakness, such as a decrease in perceived creditworthiness and increased interest costs (Hammersley *et al.*, 2012). Wu *et al.* (2011) examine the impact of remediating internal control weaknesses and report increases in firms' value and decreases in earnings management after internal control weaknesses remediation. Similarly, Brown *et al.* (2014) suggest that greater effectiveness of internal control could increase earnings quality after the correction of internal control weakness.

The purpose of this study is to examine the impact of internal control weakness and failure of remediation on audit opinions, i.e. whether the audit opinions issued to the US listed firms are associated with the presence of Section 404 of the SOX material weakness and failure of material weakness remediation. In other words, whether auditors are more likely to issue modified audit opinions to firms with ICWs to manage control risks, and whether auditors will issue modified audit opinions if firms failed to remediate their ICWs. The existing literature on the relationship between internal control weakness and audit opinion is quite scarce so far and lacks reliable support for empirical analysis. Most of the prior studies mainly focused on the association between audit fees and internal control weakness and concluded that there is a positive relationship between them. However, only a few studies examined the impact of internal control weaknesses and failure of remediation on audit opinions. Based on a handful of prior studies on internal control weakness and audit opinions, this study analyses the relationship between internal control weakness and modified audit opin-

ions, as well as the relationship between the failure of internal control weakness remediation and modified audit opinions. This paper, thus, contributes to the vastly unexplored area of research in the US context under SOX Section 404. It provides some new and supplementary shreds of evidence to the current dearth of literature on internal control weakness and audit opinion relationships.

The remainder of the paper is structured as follows: Section 2 provides the literature review and hypotheses development. Section 3 explains the research methodology and data while Section 4 describes the empirical results and robustness tests. Section 5 reports additional test and Section 6 presents the concluding remarks.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Internal Control Weakness and Remediation

According to the Committee of Sponsoring Organizations (COSO) framework, internal control is defined as a process effected by an entity's board of directors, management, and others that is intended to provide reasonable assurance that objectives will be achieved. The main role of internal control is not only to provide reasonable assurance for the reliability of financial reporting but also to prepare financial statements in accordance with generally accepted accounting principles (GAAP) for external purposes (PCAOB, 2004). Effective internal controls are critical to the reliability of reports achieved (Kinney *et al.*, 1990) and are also the fundamental driver of earnings quality (Doyle *et al.*, 2007a). The more complete the internal control, the higher the credibility of the accounting information and financial statements.

With the introduction of the SOX Section 404 in 2002, the study of internal control was intensified. A group of studies examined the characteristics of firms reporting internal control deficiencies. According to these studies, firms with more complex operations and a wider range of operations are more likely to encounter internal control problems (Ashbaugh-Skaife *et al.*, 2007). Nevertheless, study also reported that firms that are smaller in scale, lower in profits, fast-growing, younger, or undergoing restructuring are also more likely to have weak internal controls (Ge and McVay, 2005) as they are less likely to have the staff and expertise to maintain internal control systems, coupled with the financial constraints that these companies are facing. On the other hand, large firms are more likely to have an internal audit section that can reduce the occurrence of errors in financial reports and they in general have higher internal control quality (Kinney and McDaniel, 1989).

Ashbaugh-Skaife *et al.* (2009) found that firms with internal control defects have higher idiosyncratic risks, systematic risks, and cost of equity. The higher the idiosyncratic risk, the more likely the company is to experience a sharp drop in its share price. Positive correlation was also reported between weak internal control, corporate risks, and the cost of equity capital (Ogneva *et al.*, 2007; Ashbaugh-Skaife *et al.*, 2009). The reason is that ineffective internal controls lead to less reliable financial reporting, thus increasing the information risk faced by investors, which means a higher cost of equity (Ashbaugh-Skaife *et al.*, 2009). ICWs can also be a

symptom of poor management control in general, which can increase business risk and cost of equity (Ogneva *et al.*, 2007).

Moreover, Doyle *et al.* (2007b) found that the accruals quality of firms with internal control deficiencies was lower than that of the samples of firms that did not report internal control deficiencies. Firms reporting ICWs show greater noise in accruals and larger abnormal accruals than firms that do not report ICWs (Ashbaugh-Skaife *et al.*, 2008). Because the effectiveness of internal controls reflects the level of corporate governance, ineffective internal control may show the lack of ability and credibility of the management. Moreover, Feng *et al.* (2009) found that the quality of internal control not only influences reported earnings but also affects the internal reports used by management to form forecasts such as earnings expectations. In firms with internal control weaknesses, management forecast accuracy is significantly lower.

Reporting on the internal control system should provide early warning signals to users of financial statements, such as investors, of potential problems that may result from weak internal controls (PCAOB, 2004). Ineffective internal controls can make investors lose their confidence in firms and cause them to react negatively because they are concerned about the quality of financial information (Ashbaugh-Skaife *et al.*, 2008). Disclosure of material weaknesses may lead investors to question the reliability of financial reports, and investors may consider the possibility of material misstatement and non-compliance with GAAP (Doyle *et al.*, 2007a). For a company that received an unqualified opinion on the financial statements, an adverse internal control opinion still can impair the reliability of the financial statements (Schneider and Church, 2008). As a result, investors are more likely to make negative investment decisions. The disclosure of deficiencies in internal controls has a significant negative correlation with the stock price, which indicates that investors revise their expectations about firm value after disclosure of weak internal control (Hammersley *et al.*, 2007).

Regulators and public media pay attention to the remediation of internal control defects because it can improve the reliability of financial reporting. Weakness in a company's internal control will increase the company's control risk and reduce the credibility of its accounting information. Scholars agreed that for firms, remediation is important and suggested improving investor confidence by sending signals that a company's financial statements are more reliable (Ashbaugh-Skaife *et al.*, 2007).

2.2. Audit Opinions

An audit report is an informed assessment of a company's financial position and future. The information presented by the audit report has a significant influence on the decision of the investors. Auditors can express different types of opinions on financial statements that reflect the different credibility levels of financial reports. The common unqualified opinion means that the auditor believes that the financial statements fairly reflect the conditions of the company as well as financial results in all significant aspects, indicating that the financial statements are credible and are deemed to be free from material misstatement (Hammersley *et al.*,

2012). However, auditors also issue modified audit reports, which are any other than an unqualified report, including qualified reports, adverse reports, or disclaimer of opinion reports (American Institute of Certified Public Accountants [AICPA], 2011). The auditor will issue a qualified opinion to a firm when financial records of the firm are not maintained in accordance with GAAP but no misrepresentations are found. The worst financial reports to firms are adverse opinions, which indicate that a company's financial records do not conform to GAAP. An adverse opinion is often an indicator of fraud. If the auditor is unable to complete an accurate audit report, such as without appropriate financial records, they will issue a disclaimer of opinion, stating that an opinion on the company's financial status cannot be determined. There are also unqualified reports with explanatory paragraphs, which may indicate potential misstatements in the future (Czerney *et al.*, 2014).

Although providing a modified audit opinion does not always mean that the financial report is not credible, modified audit opinions will adversely affect the judgment of stakeholders on the business performance of the enterprise. Compared with an unqualified opinion, modified opinions are more likely to be related to lower quality financial reports, including a higher risk of financial statement misstatement, higher risk of a future financial statement restatement, lower sustainability of earnings, lower predictability of earnings, and lower transparency of financial statements (Lopez *et al.*, 2009). A modified opinion is a hint that auditors have doubts about the continued operation of the company's business. Evidence provided by Asare and Wright (2012) shows that adverse audit opinions damaged users' confidence in financial statements, thus affecting their investment decisions. Schneider and Church (2008) found that adverse audit opinions reduced loan officers' confidence in the fair presentation of financial statements in accordance with GAAP.

2.3. Hypotheses Development

Under the SOX, since 2002, the management of listed firms must report their evaluation of the effectiveness of internal controls over financial reporting. Section 404(a) requires management to provide internal control assessments, while Section 404(b) requires external auditors to provide audit opinions on the effectiveness of these controls.

According to previous literature, auditors will take some actions to avoid control risks. In addition to charging firms with ICWs higher audit fees or withdrawing from these clients, auditors can also respond to customers' internal control risks by taking a more cautious approach and issuing modified opinions to such firms. Previous literature has found that modified audit opinions are more likely to occur in firms with high litigation risks (Krishnan and Krishnan, 1996). Chen and Chen (2019) find that auditors are more likely to issue adverse opinions for client firms with higher ex ante litigation risk. Kinney and McDaniel (1989) also suggest that weak internal controls can increase the probability of material errors in accounting disclosures. The possibility of material misstatement in the financial statements will increase when the enterprise has ICWs, which will increase the operating risk of the enterprise. If listed firms have weaknesses in internal control, auditors are more likely to issue modified

audit opinions to improve audit quality and avoid litigation and reputation risks.

On the one hand, firms with higher litigation risk are more likely to receive modified audit opinions. On the other hand, earnings management is also a critical factor influencing audit opinion (Francis and Krishnan, 1999). Previous research has shown that firms with weaknesses in internal controls tend to have more earnings management. Farazdaghi *et al.* (2020) find a negative effect of the internal control weakness on the accruals' quality. They also report moderating effect of a number of corporate governance variables in both directions on the relationship between the internal control weakness and accruals' quality in the listed firms. Butler *et al.* (2004) argue that the relationship between modified opinions and abnormal accruals only exists in firms under financial distress. According to Ge and McVay (2005), firms with internal control weaknesses tend to be smaller and more prone to financial distress. Apart from the above, Dashtbayaz *et al.* (2022) evaluate the relationship between internal control weakness and different types of auditor opinions in fraudulent and non-fraudulent firms, and find significant positive relationship between them in both groups of firms. Considering the above context and discussion, our first hypothesis is developed as follows:

H1: The listed firms with internal control weaknesses (ICWs) are more likely to be issued modified audit opinions than those without such weaknesses.

Again, if the un-remediated ICWs increase auditors' attention to the management's commitment to effective internal control, financial reporting, and integrity, failure to remediate may lead to a greater possibility of modified audit opinions (Hammersley *et al.*, 2012). Therefore, it is expected that these firms that fail to remediate their ICWs are more likely to receive modified opinions. In other words, audit opinions are more likely not to be unqualified when customers fail to remedy. Accordingly, our second hypothesis is developed as follows:

H2: The listed firms that do not remediate internal control weaknesses (ICWs) are more likely to be issued a modified audit opinion.

3. DATA AND METHODOLOGY

3.1. Sample Selection

The study is based on a large sample of the US listed firms from 2010 to 2018. Our sample period starts in 2010 and ends in 2018, which is sufficiently after the Global financial crisis and before the COVID-19 pandemic. To achieve the objectives of this study, we collected data from the Wharton Research Data Services system. The variables that contain financial data are obtained from COMPUSTAT Fundamentals Annual Database. In line with audit opinions research, unaudited firms are excluded from the sample. Firms in the finance, insurance, and real estate industry (defined as those with SIC codes 6000 through 6799) are removed because they operate under different regulations and have different nature and classification of financial statement items. The final sample consists of 19,236 observations after excluding observations with missing values.

3.2. Regression Model Specification and Measurement of Variables

To test the hypotheses of this study, we employ the following two regression models to empirically evaluate the impact of ICWs and the failure of remediation on audit opinions. Given the nature of the dependent variable, this study uses two logit regression models, following Elder *et al.* (2009), with some changes to test the relationship between modified audit opinion and internal control weaknesses.

$$OPINION_t = \beta_0 + \beta_1 ICW_t + \beta_2 SIZE_t + \beta_3 LEV_t + \beta_4 ROA_t + \beta_5 BIG4_t + \beta_6 LOSS_t +$$

$$\beta_7 GROWTH_t + \beta_8 Z-SCORE_t + e_t \quad (1)$$

$$OPINION_t = \beta_0 + \beta_1 ICW-NONRE_t + \beta_2 SIZE_t + \beta_3 LEV_t + \beta_4 ROA_t + \beta_5 BIG4_t +$$

$$\beta_6 LOSS_t + \beta_7 GROWTH_t + \beta_8 Z-SCORE_t + e_t \quad (2)$$

Following Bradshaw *et al.* (2001), the dependent variable, modified audit opinion (OPINION), is an indicator variable. The standard unqualified opinion value is 0, and the value of any other modified opinions, including qualified opinion, adverse opinion, disclaimer of opinion reports, or unqualified opinion with explanatory language is 1. As for the independent variables, ICW is measured as to whether there are material weaknesses that exist in a firm in the current year (Elder *et al.*, 2009). It is equal to 1 if there is at least one material weakness exists in a firm in the current year. Otherwise, it is equal to 0. Again, ICW-NONRE is measured as whether a company remediated its ICW disclosed in the previous year, i.e. whether a firm disclosed material weaknesses for two consecutive years. It is equal to 1 if a company disclosed material weaknesses in internal control in Year 0 (previous year), and failed to remediate them during Year 1 (current year); otherwise, it is equal to 0 (Hammersley *et al.*, 2012).

Following the relevant literature, we include several variables to control for the client firm's business risk. Larger firms are less likely to receive modified audit opinions (Chen and Church, 1992), so it is expected that SIZE has a negative coefficient. SIZE is measured as the natural logarithm of total assets. Firms with better performance have a higher return on assets and less risk and are expected to be less likely to be issued modified audit opinions (Hammersley *et al.*, 2012). Therefore, it is expected that there is a negative coefficient on ROA. ROA is equal to income before extraordinary items divided by average total assets (Elder *et al.*, 2009). Again, this study expects that firms with higher leverage, poor profitability, and high bankruptcy possibility are riskier and auditors are more likely to issue modified audit opinions for these firms. Thus, it is expected that the coefficients of LEV and LOSS are positive, and the coefficient of Z-SCORE is negative. LEV is the ratio of total debts to total assets (Elder *et al.*, 2009). LOSS is regarded as an indicator of financial distress and measured as a dummy variable that is equal to 1 if there is a loss in the current year and 0 otherwise. Z-SCORE is used to measure financial distress with a lower Z-Score indicating greater distress risk (Altman, 1968). Furthermore, this study controls sales growth (GROWTH) and auditor size (BIG4), as these are related to audit opinions (Habib, 2013). Sales growth (GROWTH) is equal to the change in sales divided by the sales in the previ-

ous year (Elder *et al.*, 2009). BIG4 is a dummy variable, indicating whether a firm is audited by a Big 4 audit firm. It is equal to 1 if a Big 4 auditor audits the company; otherwise, it is equal to 0.

4. EMPIRICAL ANALYSES

4.1. Descriptive Statistics of Variables

From the final sample (N=19,236), there are 4.01% of companies (772 firm-year observations) with at least one material weakness in their internal controls. While 95.99% of the sample comprised companies with effective internal controls. From 2010 to 2018, a total of 2822 modified audit opinions were issued to firms in the sample.

Table 1. Comparison of Means of ICW Firms and non-ICW Firms.

Variables	Non-ICW			ICW			Mean Diff.
	N	Mean1	Sd	N	Mean2	Sd	
OPINION	18464	0.141	0.348	772	0.291	0.455	-0.151***
ICW-NONRE	18464	0.000	0.000	772	0.33	0.471	-0.330***
SIZE	18464	7.283	1.783	772	6.54	1.581	0.743***
LEV	18464	0.252	0.225	772	0.275	0.240	-0.023***
ROA	18464	0.041	0.177	772	-0.007	0.204	0.048***
BIG4	18464	0.847	0.360	772	0.72	0.449	0.126***
LOSS	18464	0.276	0.447	772	0.466	0.499	-0.190***
GROWTH	18464	0.111	0.357	772	0.108	0.440	0.003
*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.							

Table 1 shows the comparison of means of ICW firms and non-ICW firms. About 29.1% of the ICW firms received modified audit opinions, compared to 14.1% of the non-ICW firms. The difference between the mean OPINION of these two groups is significant at the 1% level, implying that firms with an ICW are more likely to receive a modified audit opinion, which is consistent with hypothesis 1 of this study. Regarding remediation, only 33% of ICW firms successfully remediated their prior year’s internal control weaknesses. The comparison of other control variables between ICW firms and non-ICW firms indicates a significant difference between these two groups of firms with the exception of sales growth (GROWTH), where ICW firms appear to have lower mean values, compared to non-ICW firms.

Further, Table 2 presents the comparison of means of sample firms with unqualified opinions and modified opinions. It is evident that firms with a modified opinion are significantly different from firms with unqualified opinions with respect to all variables except for sales growth (GROWTH). Firms that are issued modified audit opinions have a lower Z-score, higher leverage, and poorer profitability, consistent with previous literature.

Table 2. Comparison of Means of Firms with Unqualified and Modified Opinion.

Variables	OPINION 0			OPINION 1			Mean Diff.
	N	Mean1	Sd	N	Mean2	Sd	
ICW	16414	0.033	0.179	2822	0.08	0.271	-0.046***
ICW-NONRE	16414	0.011	0.104	2822	0.026	0.160	-0.015***
SIZE	16414	7.231	1.767	2822	7.383	1.858	-0.152***
LEV	16414	0.244	0.221	2822	0.305	0.244	-0.060***
ROA	16414	0.047	0.165	2822	-0.004	0.236	0.051***
BIG4	16414	0.837	0.369	2822	0.865	0.342	-0.028***
LOSS	16414	0.272	0.445	2822	0.351	0.477	-0.079***
GROWTH	16414	0.111	0.355	2822	0.11	0.388	0.000
Z-SCORE	16414	3.999	5.241	2822	2.225	5.277	1.774***
*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.							

Table 3. Summary Statistics of Variables.

Variable	N	Mean	Sd	Min	Median	Max
OPINION	19236	0.147	0.354	0.000	0.000	1.000
ICW	19236	0.040	0.196	0.000	0.000	1.000
ICW-NONRE	19236	0.013	0.114	0.000	0.000	1.000
SIZE	19236	7.253	1.781	3.277	7.191	11.511
LEV	19236	0.253	0.226	0.000	0.226	1.061
ROA	19236	0.039	0.178	-0.912	0.070	0.348
BIG4	19236	0.841	0.365	0.000	1.000	1.000
LOSS	19236	0.284	0.451	0.000	0.000	1.000
GROWTH	19236	0.111	0.360	-0.684	0.059	2.384
Z-SCORE	19236	3.739	5.283	-13.506	2.946	29.023

Finally, Table 3 demonstrates the summary statistics of the variables used for empirical analyses. The mean of audit opinion (OPINION) is 0.147, which indicates that auditors issue unqualified audit opinions to most selected firms. The mean of firms with internal control weakness (ICW) is 0.04, suggesting that most firms do not have a material weakness in their internal control. Again, the mean of remediation (ICW-NONRE) is 0.013, indicating that only a few firms did not remediate their previous internal control weakness. From the perspective of control variables, the average value of firm size is 7.25 with a minimum of 3.28 and a maximum of 11.51. The mean value of LEV, ROA, LOSS, and GROWTH are, respectively, 0.25, 0.04, 0.28, and 0.11. The mean value of BIG4 is 0.841, which indicates that most listed firms in the US are audited by big-4 audit firms. In addition, the average value of Z-SCORE is 3.74, with a minimum of -13.51, a maximum of 29.02, and a very large standard deviation of 5.283, signifying huge variations in the sample firms’ probability of bankruptcy.

Table 4. Correlation Matrix of Variables.

	OPINION	ICW	ICW-NONRE	SIZE	LEV	ROA	BIG4	LOSS	GROWTH	Z-SCORE
OPINION	1.000									
ICW	0.084***	1.000								
ICW-NONRE	0.047***	0.567***	1.000							
SIZE	0.030***	-0.082***	-0.056***	1.000						
LEV	0.095***	0.020***	0.022***	0.295***	1.000					
ROA	-0.102***	-0.053***	-0.034***	0.377***	-0.027***	1.000				
BIG4	0.027***	-0.068***	-0.053***	0.403***	0.121***	0.147***	1.000			
LOSS	0.062***	0.083***	0.058***	-0.316***	0.091***	-0.587***	-0.107***	1.000		
GROWTH	0.0001	-0.002	0.011	-0.076***	-0.026***	-0.027***	-0.041***	0.003	1.000	
Z-SCORE	-0.119***	-0.048***	-0.042***	-0.088***	-0.440***	0.382***	-0.059***	-0.254***	0.081***	1.000

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

4.2. Correlation Matrix

Table 4 shows the correlation matrix for all variables included in the main regression models. As shown in the table, the variables of interest ICW and ICW-NONRE and most of the control variables are found to have a significant correlation with the dependent variable OPINION. While the majority of the correlations are statistically significant, there is no sign of a multicollinearity problem. Moreover, we tested the explanatory variables using the Variance Inflation Factors (VIF) to avoid the invalidity of the estimator caused by multicollinearity and find the maximum value of VIF is 1.9, and the average VIF is 1.46, far less than 10, indicating no serious multicollinearity problems between the independent variables.

4.3. Regression Results and Discussion

Table 5 reports the results of the logistic regression analysis for regression Model 1, i.e. testing the association between internal control weakness (ICW) and modified audit opinions (OPINION). The coefficients of ICW (0.892), odds ratio (2.441), and marginal effect (0.109) are positive and significantly associated with modified audit opinions (OPINION) at a 1% level of significance. A significant and positive relationship exists between material weaknesses in internal controls (ICW) and modified audit opinion (OPINION), which supports the first hypothesis (H1). The odds ratio shows that when ICW is equal to 1, the probability of a modified audit opinion is 2.441 times as high as when ICW is equal to 0. The marginal effect indicates that an ICW has a 10.9% increase in the likelihood of a firm’s receiving a modified opinion, given all other variables remain unchanged.

Table 5. Logit Regression Result for Model 1.

VARIABLES	Coef.	Odds ratio	Margin
ICW	0.892***	2.441***	0.109***
	[0.0847]	[0.207]	[0.0103]

SIZE	0.0728***	1.076***	0.00887***
	[0.0170]	[0.0182]	[0.00205]
LEV	0.497***	1.644***	0.0605***
	[0.0945]	[0.155]	[0.0115]
ROA	-0.383	0.682	-0.0466
	[0.298]	[0.204]	[0.0362]
BIG4	0.183***	1.201***	0.0223***
	[0.0658]	[0.0790]	[0.00800]
LOSS	0.223***	1.250***	0.0272***
	[0.0718]	[0.0898]	[0.00879]
GROWTH	0.000366***	1.000***	4.45e-05***
	[0.000111]	[0.000111]	[1.35e-05]
ZSCORE	-0.0214***	0.979***	-0.00260***
	[0.00650]	[0.00637]	[0.000791]
Constant	-2.634***	0.0718***	
	[0.125]	[0.00901]	
Observations	19,236	19,236	19,236
R ²	0.0283	0.0283	

t statistics are in brackets;
*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

As far as control variables are concerned, the coefficient of SIZE, LEV, BIG4, LOSS, and GROWTH are 0.073, 0.497, 0.183, 0.223, and 0.0004, respectively, and all of them are positive significant at a 1% level. While these indicate that they have significantly positive effects on OPINION, the results of SIZE and GROWTH are contrary to expectation.

The result of BIG4 supports the view of Keasey *et al.* (1988) and Habib (2013) that Big 4 audit firms are more likely to issue modified audit opinions. Similarly, high leverage is aligned to receiving modified audit opinions. Also, less profitable firms are more likely to be issued a modified audit opinion, which confirms that the existence of a loss has become an important driver in audit opinion, consistent with Dopuch *et al.* (1987). Finally, Z-SCORE has a negative significant coefficient at a 1% level, which indicates that it would reduce the likelihood that the company will be issued a modified audit opinion. The result of Z-SCORE supports the view of Kirkos *et al.* (2007) that firms that show low profitability and financial distress are more likely to be issued modified opinions.

Table 6. Logit Regression Result for Model 2.

VARIABLES	Coef.	Odds ratio	Margin
ICW-NONRE	0.821***	2.274***	0.100***
	[0.145]	[0.331]	[0.0178]
SIZE	0.0686***	1.071***	0.00839***
	[0.0168]	[0.0180]	[0.00205]
LEV	0.496***	1.642***	0.0606***
	[0.0930]	[0.153]	[0.0114]
ROA	-0.368	0.692	-0.045
	[0.297]	[0.205]	[0.0362]
BIG4	0.166**	1.181**	0.0204**
	[0.0655]	[0.0774]	[0.00801]
LOSS	0.242***	1.274***	0.0296***
	[0.0714]	[0.0910]	[0.00878]
GROWTH	0.000361***	1.000***	4.41e-05***
	[0.000107]	[0.000108]	[1.32e-05]
ZSCORE	-0.0222***	0.978***	-0.00271***
	[0.00648]	[0.00634]	[0.000792]
Constant	-2.559***	0.0774***	
	[0.124]	[0.00962]	
Observations	19,236	19,236	19,236
R ²	0.0239	0.0239	
<i>t</i> statistics are in brackets; *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.			

Further, Table 6 presents the results of the logistic regression analysis for regression Model 2, i.e. the relationship between the firms that fail to remediate their previous weakness in internal control (ICW-NONRE) and the audit opinion (OPINION) they received. Consistent with expectation, the variable ICW-NONRE is positive and significant at a 1%

level, which indicates that ICW-NONRE is a contributor to increasing the possibility of modified audit opinion. The positive significant coefficients of ICW-NONRE (0.821), odds ratio (2.274), and marginal effect (0.10) imply that firms that have material weakness last year and failed to remediate last-year internal control weakness are more likely to receive a modified audit opinion, which supports the second hypothesis (H2). Regarding control variables, the findings are exactly similar to the ones found in Table 4.

4.4. Robustness test: Winsorising and Propensity Score matching (PSM)

To test the robustness of our findings, firstly, we have winsorised all the variables at the 1% and 99% levels to minimize the impact of extreme values, and the regression results of both Models 1 and 2 are re-evaluated. The untabulated results indicate that the signs and significance of the variable coefficients remain unchanged with the exception of ROA showing a negative significant effect, as expected, while LOSS and GROWTH are no longer revealing significant effects. These findings indicate that the regression results are robust, which further confirmed hypothesis 1 (H1) and hypothesis 2 (H2) of the study.

Table 7. PSM Regression Result for Model 1.

VARIABLES	Coef.	Odds ratio	Margin
ICW	0.896***	2.451***	0.142***
	[0.134]	[0.329]	[0.0205]
SIZE	0.102**	1.108**	0.0162**
	[0.0518]	[0.0574]	[0.00817]
LEV	0.212	1.237	0.0336
	[0.279]	[0.345]	[0.0441]
ROA	-1.765***	0.171***	-0.279***
	[0.396]	[0.0678]	[0.0614]
BIG4	0.0765	1.08	0.0121
	[0.166]	[0.179]	[0.0263]
LOSS	0.0724	1.075	0.0115
	[0.150]	[0.161]	[0.0237]
GROWTH	-0.0913	0.913	-0.0144
	[0.159]	[0.145]	[0.0251]
ZSCORE	-0.0423**	0.959**	-0.00670***
	[0.0165]	[0.0158]	[0.00259]
Constant	-2.541***	0.0788***	
	[0.341]	[0.0269]	
Observations	1,516	1,516	1,516
R ²	0.0749	0.0749	.
<i>t</i> statistics are in brackets;			

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Next, in order to avoid endogeneity problems, we have used Propensity Score Matching (PSM) to test hypothesis 1 (H1) and hypothesis 2 (H2). Following Donelson et al. (2017), firms are matched on observable characteristics for comparing the ‘treatment’ firms to the most similar ‘control’ firms. Those firms with material internal control weaknesses are taken as ‘treatment’ firms and those without material internal control weaknesses are taken as ‘control’ firms. The sample firms that did not match were eliminated, and 1,516 observations were retained.

Table 8. PSM Regression Result for Model 2

VARIABLES	Coef.	Odds ratio	Margin
ICW-NONRE	0.445***	1.560***	0.0723***
	[0.160]	[0.250]	[0.0259]
SIZE	0.119**	1.126**	0.0193**
	[0.0507]	[0.0570]	[0.00819]
LEV	0.174	1.191	0.0283
	[0.277]	[0.329]	[0.0450]
ROA	-1.740***	0.175***	-0.283***
	[0.394]	[0.0692]	[0.0628]
BIG4	0.0573	1.059	0.0093
	[0.162]	[0.171]	[0.0263]
LOSS	0.09	1.094	0.0146
	[0.149]	[0.163]	[0.0242]
GROWTH	-0.0721	0.93	-0.0117
	[0.163]	[0.152]	[0.0265]
ZSCORE	-0.0399**	0.961**	-0.00648**
	[0.0167]	[0.0160]	[0.00269]
Constant	-2.207***	0.110***	
	[0.328]	[0.0361]	
Observations	1,516	1,516	1,516
R ²	0.0505	0.0505	.
t statistics are in brackets;			
*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.			

Table 7 shows the results of the PSM regression analysis of regression Model 1. The coefficients of ICW (0.896) exhibit a positive significant relationship with modified audit opinions (OPINION) at a 1% level of significance, consistent with the finding in Table 5. Both the odds ratio (2.451) and marginal effect (14.2%) are also significant and increased in

Table 7 compared to Table 5. It can be concluded that firms with ICW are more likely to receive modified audit opinions. Again, Table 8 illustrates the results of the PSM regression analysis for regression Model 2. The coefficients of ICW-NONRE (0.445) display a positive significant relationship with modified audit opinions (OPINION) at a 1% level of significance, consistent with the previous conclusion reported in Table 6. Both the odds ratio (1.56) and marginal effect (7.23%) are also significant in Table 8. These findings imply that firms that failed to remediate previous material weaknesses in internal control are more likely to receive modified audit opinions. Overall, the PSM regression results confirm that both ICW and ICW-NONRE can significantly affect OPINION, hence hypothesis 1 (H1) and hypothesis 2 (H2) are accepted.

4.5. Additional Test: Prior Year Audit Opinions and Remediated Internal Control Weakness

Tables 5 and 6 of the main findings reported that firms having material internal control weakness (ICW) and/or failing to remediate their previous weakness in internal control (ICW-NONRE) are more likely to receive a modified audit opinion (OPINION) in the current year. Here, we further examine whether the modified audit opinion (OPINION).

Table 9. Logit Regression Results with Prior Year Audit Opinions and Unremedied Internal Control Weakness.

VARIABLES	Test 1: Coef.	Test 2: Coef.	Test 3: Coef.
ICW	0.129***		
	[9.540]		
ICW-NONRE		0.076***	
		[3.404]	
ICWRE			-0.004
			[-0.212]
GCO	0.286***	0.286***	0.287***
	[12.598]	[12.533]	[12.597]
IOPINION	0.280***	0.281***	0.282***
	[37.319]	[37.286]	[37.431]
SIZE	0.011***	0.010***	0.010***
	[5.550]	[5.154]	[5.002]
BIG4	0.011	0.010	0.008
	[1.445]	[1.193]	[1.064]
LEV	0.056***	0.058***	0.059***
	[3.982]	[4.121]	[4.186]
ROA	-0.167***	-0.171***	-0.172***
	[-8.612]	[-8.837]	[-8.880]
LOSS	-0.015	-0.019	-0.020

	[-1.043]	[-1.288]	[-1.404]
GROWTH	-0.008	-0.009	-0.008
	[-1.202]	[-1.280]	[-1.268]
Z-SCORE	-0.001**	-0.002***	-0.002***
	[-2.489]	[-2.626]	[-2.707]
Constant	0.005	0.017	0.021
	[0.376]	[1.209]	[1.494]
Observations	15,262	15,262	15,262
R ²	0.139	0.134	0.133
<i>t</i> statistics are in brackets;			
*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.			

received in the current year is also affected by the modified audit opinion or going-concern opinion that the firm has received last year, as highlighted in some academic literature (Habib, 2013). As shown in Table 9, we rerun the regression models by including prior year going-concern (GCO) and prior year modified audit opinion (IOPINION) dummy variables. Results from Test 1 in Table 9 (Column 2) confirm that, along with ICW, both GCO and IOPINION are significantly and positively associated with current year modified audit opinion (OPINION). Similarly, results from Test 2 in Table 9 (Column 3) affirm that, along with ICW-NONRE, both GCO and IOPINION have significant positive impacts on current year modified audit opinion (OPINION).

Next, we further test whether firms that remediate their last year's material internal control weakness (ICWRE) have a lower likelihood of receiving a modified audit opinion (OPINION). The results shown for Test 3 in Table 9 (Column 4) reveal that ICWRE has no significant relationship, *albeit* having a negative sign, with the current year modified audit opinion (OPINION), although both GCO and IOPINION indicate a positive significant association with modified audit opinion (OPINION). These findings are interesting to note and suggest that successful remediation of the previous year's internal control weaknesses (ICWRE) is not a contributor to reducing the possibility of receiving a modified audit opinion (OPINION) in the current year.

5. CONCLUSION

This study investigates whether the audit opinions issued to the US listed firms are associated with the presence of the SOX Section 404 material internal control weakness and failure of material weakness remediation. In other words, it explores the relationship between internal control weakness and modified audit opinions, as well as the relationship between the failure of internal control weakness remediation and modified audit opinions. Our baseline findings and robustness tests confirm that material weaknesses in internal controls are positively related to modified audit opinions. Firms with weak internal controls disclosed are more likely to be issued a modified audit opinion compared to firms with effective internal controls. In addition, firms that had a material internal control weakness in the past year and failed to

remediate are more likely to be issued modified audit opinions. Our additional tests also indicate that last year's modified audit opinion or going-concern opinion contribute to receiving a modified audit opinion in the current year. Interestingly, firms that successfully remediate their previous year's material internal control weakness are not immune to lowering the likelihood of receiving a modified audit opinion in the current year compared to firms that have not remediated their material weaknesses.

It is expected that the findings of the study are of interest to firms, regulators, and users of financial statements in considering the negative impact of internal control weaknesses and unremedied weaknesses on audit opinions for the financial statements. For auditors, the focus on client risk management makes sense in the post-SOX era, because auditors take on more risk in auditing public firms. Auditors should be more cautious in their response to risks. For listed firms, the discovery and remediation of ICWs will have an impact on the operating conditions of firms and the audit opinion they received, while the audit opinion will affect the behaviour of investors, so it is of great significance to pay attention to ICWs. The findings should also help managers who have to make cost-benefit decisions about whether to invest resources in ICWs remediation.

This study has certain limitations to be recognized with regard to our findings. First and foremost, we used data from one developed country only. Our sample might not be considered large enough although it is among the highest in cross-section studies. Future studies could increase the sample size by extending the time period or using a more robust dataset from multiple countries and regions in order to generalize findings in other settings. Secondly, we have not included other internal corporate governance variables in the regression analyses. Future researchers can consider other governance variables that might affect financial reporting quality and credibility. In addition, future scholars can also pay more attention to studying the characteristics of firms, causes of internal control weaknesses and remediation failure as well as the consequences therein. Despite these apparent limitations, we argue that our study is timely and relevant in the US context providing some insightful and new findings on the relationship between internal control weakness, remediation failure, and audit opinions.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflict of interest.

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