![PCAOB - Public Company Accounting Oversight Board]

Staff White Paper

The Impact of Quality Control System Remediation on Audit Performance and Financial Reporting Quality

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I.   EXECUTIVE SUMMARY

The PCAOB is committed to robust economic analysis of new or amended PCAOB rules and standards. As part of that commitment, Office of Economic and Risk Analysis (OERA) staff has performed an economic analysis of the PCAOB's proposed new quality control (QC) standard.[2] The economic analysis suggests that the proposed new QC standard could lead to: (1) greater compliance with professional standards; and (2) improved financial reporting quality. This staff white paper tests these hypotheses by quantifying, for triennial firms,[3] the historical associations between satisfactory remediation of PCAOB Part II QC deficiencies[4] and (1) subsequent Part I.A deficiencies, and (2) subsequent material restatements of firms' issuer clients' audited financial statements.

In lieu of direct historical experience with the proposed new QC standard, we use historical satisfactory remediation efforts as our proxy for a more effective QC system. We use Part I.A deficiencies as our proxy for compliance with professional standards because they represent deficiencies in issuer audits selected for inspection that were of such significance that the Board believes that the firm, at the time it issued its audit report, had not obtained sufficient appropriate audit evidence to support its opinion on the issuer's financial statements and/or internal control over financial reporting. We use material restatements as our proxy for financial reporting quality because they indicate that the audited financial statements were materially misstated. We limit our analysis to triennial firms because annual firms may be undergoing remediation efforts every year, and it would be difficult to distinguish between the immediate effect of one remediation effort and the lagging effect of another.

Key Findings

- <u>Compliance with professional standards</u>: Using several different statistical approaches, we find that satisfactory remediation of PCAOB Part II QC deficiencies is consistently significantly negatively associated with Part I.A deficiencies, our proxy for compliance with professional standards.

  - Our comparison of means analysis [**Figure 1** and **Table 1**, p. 7] finds that firms that satisfactorily remediated PCAOB Part II QC deficiencies have a 31.5 percentage point lower subsequent Part I.A deficiency rate than firms that did not satisfactorily remediate.[5] This difference is statistically significant.

  - After controlling for factors that may influence the incidence of Part I.A deficiencies (e.g., issuer characteristics, audit firm industry expertise), our econometric models [**Table 2**, p. 10] indicate that satisfactory remediation is associated with a highly statistically significant

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[2] *See* PCAOB Release No. 2022-006 (Nov. 18, 2022) ("proposing release") at Section VI, available at https://pcaobus.org/about/rules-rulemaking/rulemaking-dockets/docket-046-quality-control.

[3] Firms that provide 100 or fewer audit opinions ("triennial firms") must be inspected at least once every three years. Firms that provide more than 100 audit opinions ("annual firms") must be inspected annually.

[4] Deficiencies presented in Part II of a firm's inspection report include criticisms of, and potential defects in, a firm's QC system. If a firm does not address to the Board's satisfaction the deficiencies presented in Part II of the report within 12 months of the issuance date, Part II of the firm's inspection report are made public. *See* Section 104(g)(2) of the Sarbanes-Oxley Act of 2002 as amended.

[5] We calculate Part I.A deficiency rates by dividing the number of reviewed issuer audits which had at least one Part I.A deficiency by the number of reviewed issuer audits.

decrease in the probability of subsequently having at least one Part I.A deficiency, which ranges between 20.4 and 26.4 percentage points.

- o Our difference-in-differences ("DiD") model [**Table 3**, p. 12] indicates that satisfactorily remediating firms reduce their subsequent Part I.A deficiency rate by a statistically significant 9.1 percentage points, of which 6.6 percentage points may be attributable to the satisfactory remediation effort.

- Financial reporting quality: We find that satisfactory remediation of PCAOB Part II QC deficiencies is significantly associated with fewer subsequent issuer client restatements, our proxy for financial reporting quality, for some statistical approaches but not for others.

- o Our comparison of means analysis [**Figure 2** and **Table 4**, p. 13] finds that issuer clients of firms that satisfactorily remediated PCAOB Part II QC deficiencies have a 3.3 percentage point lower subsequent restatement rate than issuer clients of firms that did not satisfactorily remediate.[6] This difference is statistically significant.

- o After controlling for factors that may influence the incidence of issuer restatement (e.g., issuer characteristics, audit firm industry expertise), our econometric models [**Table 5**, p. 15] indicate that satisfactory remediation is associated with statistically significant decreases in the probability of subsequent issuer client restatement, which ranges between 4.1 and 6.4 percentage points.

- o Our DiD model [**Table 6**, p. 15] indicates that issuers audited by satisfactorily remediating firms reduce their subsequent restatement rate by a statistically insignificant 0.6 percentage points, of which 0.5 percentage points may be attributable to the satisfactory remediation effort.

II. BACKGROUND

The PCAOB Inspection Process

The PCAOB inspects registered public accounting firms to assess compliance with PCAOB standards and rules, as well as other regulatory and professional requirements that are applicable to the firm's system of quality control and to the portions of a firm's issuer audits selected for review during a PCAOB inspection. Any deficiencies identified through a PCAOB inspection are evaluated for inclusion in the firm's inspection report. Part I.A of the inspection report includes deficiencies in reviewed issuer audits that were of such significance that the Board believes that the firm, at the time it issued its audit report, had not obtained sufficient appropriate audit evidence to support its opinion on the issuer's financial statements and/or internal control over financial reporting. If a PCAOB inspection identifies a quality control problem of significance, the deficiencies will be discussed with the firm and will appear in Part II of the final inspection report.[7] Part II of the report will remain non-public as long as the firm remediates the deficiencies to the

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[6] We calculate restatement rates by dividing the number of reviewed issuer audits for which the issuer subsequently materially restated its financial statements by the number of reviewed issuer audits. We exclude from the calculations reviewed audits of foreign private issuers, benefit plans, funds, and referred work engagements because, in these cases, data on restatements are either not readily accessible or a less useful proxy for financial reporting quality.

[7] PCAOB inspections are not designed to review all aspects of a firm's quality control system. Not every PCAOB inspection identifies deficiencies with the firm's quality control system and nothing in Part I of the inspection report should be interpreted to imply the Board has reached a conclusion about a firm's quality control policies, procedures, or practices.

Board's satisfaction within 12 months from the date of the inspection report ("remediation period").[8] During the remediation period, firms have the opportunity to discuss their remediation effort with PCAOB staff and may submit evidence to the Board pursuant to PCAOB Rule 4009 regarding the ways in which the firm has addressed its QC deficiencies presented in Part II of the firm's inspection report ("Rule 4009 Submission"). Failure to submit a timely Rule 4009 submission constitutes a failure to address the firm's QC deficiencies. In deciding whether the Board is satisfied with a firm's remediation effort, the Board typically looks for a demonstration of "substantial, good faith progress toward achieving the relevant quality control objectives, sufficient to merit the result that the criticisms remain nonpublic."[9] The Board's approach to remediation avoids prescribing specific remediation approaches. Instead, the Board's approach allows each firm to craft effective remedies based on the firm's particular organizational structure and operations. A favorable determination does not imply that the firm has completely and permanently cured any particular QC deficiency.

Prior Research

Several academic studies point to the potential impacts of satisfactory remediation on financial reporting quality using a variety of approaches.[10] Buslepp and Victoravich (2014) and Carlisle (2020) use restatements as their proxy for financial reporting quality and infer remediation outcomes upon reviewing the public portions of firms' PCAOB inspection reports. Aobdia (2018, 2019b) also uses restatements, but utilizes non-public information regarding Part II of firms' inspection reports. Drake et al. (2016) study the financial reporting impacts of Deloitte's actions to remediate QC deficiencies related to its auditing of income tax accounts upon reviewing the public Part II portions of the firm's 2007 and 2008 inspection reports. Overall, these studies suggest that satisfactory remediation of QC deficiencies is associated with improved financial reporting quality.

Other research examines market reactions to public disclosure of QC deficiencies. Since publicly disclosed QC deficiencies were not satisfactorily remediated, this research can provide an indication of the value that markets place on satisfactory remediation of QC deficiencies. Dee et al. (2011) find that the public disclosure of Deloitte's QC system problems and Deloitte's representation of their attempts to address those problems led Deloitte's publicly traded clients to experience negative stock market effects. Buslepp et al. (2018) find that firms with unremediated QC deficiencies related to audit performance lose market share during the year after the release of Part I.A of the inspection report and firms with unremediated QC deficiencies related to firm management lose market share during the year after the remediation period has ended. Overall, these studies suggest that unremediated QC deficiencies are associated with negative market reactions.

We supplement the academic literature by (1) presenting issuer-level analysis of the impact of satisfactory remediation on Part I.A deficiencies and (2) using more refined information regarding remediation outcomes.[11] We also perform an analysis of financial reporting quality that builds upon the empirical methodologies already described in the academic literature.

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[8] *See* Section 104(g)(2) of the Sarbanes-Oxley Act of 2002 as amended.

[9] *See The Process of Board Determinations Regarding Firms' Efforts to Address Quality Control Criticisms in Inspection Reports,* PCAOB Release No. 104-2006-077 (Mar. 21, 2006) at 6, available at https://pcaobus.org/Inspections/Documents/2006_03-21_Release_104-2006-077.pdf.

[10] *See* **Appendix A** for a more in-depth discussion of academic research related to remediation of QC deficiencies.

[11] *See* Section VI.A.1.a of the proposing release for caveats pertaining to the use of the Part I.A deficiency rate as a proxy for a firm's overall audit deficiency rate.

III. DATA

We obtain from the PCAOB's Division of Registration and Inspections (DRI) a list of outcomes of all remediation efforts made by any firm in response to Part II QC deficiencies issued between 2004 and 2015.[12] After removing remediation efforts corresponding to inspections that occurred one year after the firm's prior inspection, we are left with 1195 remediation efforts.[13] We supplement each remediation effort with information on the audits reviewed during the preceding and subsequent firm inspection including: (1) the identities of the issuer audits selected for review, (2) whether at least one deficiency appeared in Part I.A of the firm's inspection report, and (3) whether the audited issuer restated its audited financial statements.

IV. ANALYSIS

In this section, we analyze the relationship between remediation outcomes and subsequent Part I.A deficiencies and restatements.

Part I.A Deficiencies

Figure 1 compares the mean subsequent Part I.A deficiency rates across remediation outcomes.[14] 34.9% of all subsequently reviewed audits had at least one Part I.A deficiency. However, the subsequent Part I.A deficiency rate varies significantly depending on the remediation outcome. For example, firms that satisfactorily remediated all QC deficiencies have a much lower subsequent Part I.A deficiency rate (31.2%) than those that had an unsatisfactory remediation outcome (64.2%), did not respond during the remediation period (63.2%), partially remediated (62.3%), or withdrew their registration (57.1%).

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[12] The remediation outcomes are defined as follows. "Satisfactory" indicates that the Board determined the firm satisfactorily addressed all of its QC deficiencies, for purposes of Section 104(g)(2) of the Sarbanes-Oxley Act of 2002. Such a Board determination is not a determination that the firm has completely, and permanently, cured any particular QC deficiency, nor is it a general endorsement of any aspect of the firm's QC system. "Partial" indicates that the Board determined the firm addressed satisfactorily certain QC deficiencies and failed to address satisfactorily certain other QC deficiencies. "Unsatisfactory" indicates that the Board determined the firm failed to satisfactorily address all of its QC deficiencies. The portions of a firm's report that deal with the QC deficiencies that were not satisfactorily addressed are made public. "No response" indicates that the firm did not file a Rule 4009 submission and the QC deficiencies were made public under Rule 4009 (d)(1). "Withdrawal" indicates that the firm filed a Form 1-WD – Request for Leave to Withdraw from Registration ("Form 1-WD") prior to the remediation period end. In filing the Form 1-WD, the firm has asserted that it is not, and will not during the pendency of its request for leave to withdraw, engage in the preparation or issuance of, or play a substantial role in the preparation or furnishing of, an audit report (related to issuer or broker-dealer audits). Withdrawal appears in our sample because, in certain instances, if the PCAOB received Form 1-WD after the subsequent inspection cycle had begun, the PCAOB staff discontinues its evaluation of the firm's Rule 4009 submission, the QC deficiencies are not made public, and the PCAOB staff proceeds to issue the subsequent inspection report.

[13] More specifically, we drop: (1) all U.S. GNF inspections; (2) all annual NAF inspections; and (3) triennial inspections that occurred one year after the firms' prior inspection.

[14] We calculate the subsequent Part I.A deficiency rate by dividing the number of subsequently reviewed issuer audits that had at least one Part I.A deficiency by the number of subsequently reviewed issuer audits. We calculate subsequent Part I.A deficiency rates by remediation outcome by limiting the numerators and denominators to the reviewed audits performed subsequently to each remediation outcome separately.

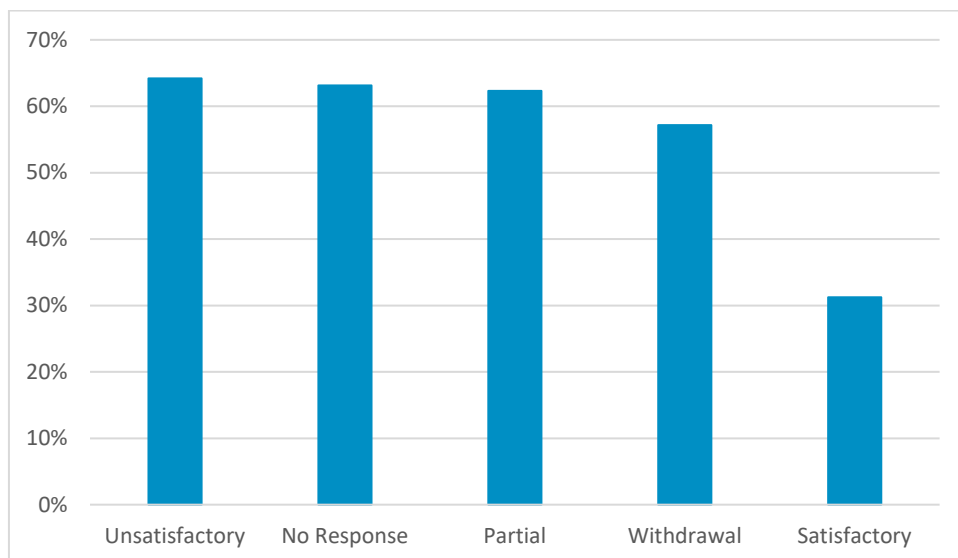## Figure 1 Mean Subsequent Part I.A Deficiency Rates by Remediation Outcome

Table 1 compares the mean subsequent Part I.A deficiency rates for each of the remediation outcomes (t-statistics reported in parentheses).[15] The results suggest that firms that satisfactorily remediated have a significantly lower subsequent Part I.A deficiency rate than firms with any other remediation outcome. The results also suggest that the other remediation outcomes (unsatisfactory, no response, partial and withdrawal) are insignificantly different from one another. Therefore, for the remainder of the analysis, we group all the remediation outcomes besides the satisfactory remediation outcome into a single non-satisfactory remediation outcome group. In untabulated analysis, we find that the mean subsequent Part I.A deficiency rate for firms that did not satisfactorily remediate is 62.7%, a statistically significant −31.5 percentage point difference vis-à-vis firms that did satisfactorily remediate.

Table 1 Difference in Mean Subsequent Part I.A Deficiency Rates for Each Remediation Outcome

	No Response	Partial	Withdrawal	Satisfactory
Unsatisfactory	−1.1	−1.9	−7.1	−33.0***
	(−0.14)	(−0.33)	(−0.51)	(−6.81)
No Response		0.1	−6.0	−31.9***
		(0.13)	(−0.42)	(−5.92)
Partial			−5.2	−31.1***
			(−0.39)	(−10.71)
Withdrawal				−25.9**
				(−2.09)

*Note: Differences are equal to the Part I.A deficiency rates for the column remediation outcomes minus the Part I.A deficiency rates for the row remediation outcomes. The units are percentage points. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. t-statistics are in parentheses.*

Though **Figure 1** and **Table 1** indicate that firms that satisfactorily remediated are significantly less likely to have at least one subsequent Part I.A deficiency than firms that did not satisfactorily remediate, the difference may not necessarily reflect the causal effect of their remedial actions. Other issuer- or firm-

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[15] A t-statistic is a standard measure of statistical significance.

level factors may explain all or part of the difference. For example, the subsequently reviewed audits performed by auditors who satisfactorily remediated may be, on average, less complex than the subsequently reviewed audits performed by auditors who did not satisfactorily remediate. If that were the case, then part of the difference in the subsequent Part I.A deficiency rate could be attributable to the complexity of their audits rather than the remedial actions themselves. To help control for such potential bias, we perform an econometric analysis that controls for several issuer- and firm-level factors that may explain all or part of the difference in the subsequent Part I.A deficiency rates between firms that satisfactorily remediated and firms that did not.[16]

Following PCAOB (2018) and academic literature as reviewed by DeFond and Zhang (2014), we include three categories of control variables in our econometric models.[17] Our first category includes issuer characteristics. *Log Total Assets* serves as a proxy for the issuer client's negotiating power, the issuer client's complexity, and the potential litigation or reputational risks to the auditor. Issuer negotiating power may compromise audit quality because the auditor may be less willing to challenge the issuer's financial reporting decisions in order to maintain the client relationship. Likewise, the complexity of the issuer may also lead to a risk of lower audit quality. On the other hand, the potential litigation and reputational damage that could follow the audit failure of a large issuer client may motivate the auditor to provide higher audit quality to help mitigate that risk. *Leverage Ratio* serves as a proxy for the presence of lenders with a financial interest in the issuer's ability to repay their loan. Shareholders may be more likely to accept lower audit quality from their auditor if they can rely instead on lenders' strong incentives to monitor company management. High leverage firms may also be under financial distress and more willing to engage in aggressive earnings management. This may lead to a risk that auditors fail to gather sufficient appropriate audit evidence. *CFO Scaled by Total Assets* serves as a proxy for agency costs within the issuer. Agency costs may arise because internally generated cash flow reduces management's dependence on external lenders who would have an incentive to monitor management. Shareholders may respond to these agency costs by increasing their demand for audit quality. *Loss Indicator, December Year-End Indicator*, *Multinational Corporation Indicator*, and *Restructuring Indicator* serve as proxies for audit difficulty. Issuers reporting a loss may be under financial distress, and their auditors may face additional challenges in obtaining sufficient audit evidence. The fieldwork for an audit of an issuer with a December year end occurs during the auditor's busy season. This leads to a risk that the auditor may have insufficient resources to gather sufficient appropriate audit evidence. Issuer clients who are multinational or reported restructuring expenses may face especially complex accounting or internal control challenges. These challenges may in turn lead to a risk that auditors fail to gather sufficient appropriate audit evidence.[18]

Our second category of control variables includes variables that characterize the relationship between the issuer client and the auditor. *New Client Indicator* and *Audit Tenure* serve as proxies for potential loss of auditor independence associated with the length of the auditor's relationship with the client. Auditors may be willing to perform a lower-quality audit to avoid disturbing their relationship with a long-time issuer client. Likewise, auditors may be lenient to new issuer clients in a bid to establish a favorable

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[16] We exclude subsequently reviewed audits of funds and benefit plans from our econometric models of Part I.A deficiencies because their financial reporting requirements are substantially different from the other issuers in our sample. We also limit our sample to subsequently reviewed audits for which we can obtain corresponding control variables from Compustat and Audit Analytics.

[17] PCAOB (2018) presents several econometric models of Part I.A deficiencies in triennial firms. DeFond and Zhang (2014) review the academic literature on audit quality.

[18] We winsorize the Compustat data for *Log Total Assets, Leverage Ratio,* and *CFO Scaled by Total Assets* at the 1% and 99% levels. Winsorization is a common technique used to minimize any undue influence of extreme outliers. Winsorizing at the 1% and 99% levels implies setting data values that fall below the 1-percentile equal to the 1-percentile value and data values that fall above the 99-percentile value equal to the 99-percentile value.

relationship. Together, these hypotheses suggest a non-linear association between audit tenure and audit quality. At the same time, *New Client Indicator* and *Audit Tenure* also serve as proxies for issuer client-specific knowledge. As such, audits of new issuer clients may exhibit lower audit quality while audits of long-time issuer clients may exhibit higher audit quality.

Our third category of control variables includes *Audit Firm Market Share*, an auditor characteristic that serves as a proxy for the auditor's expertise and market power in the issuer client's industry. Auditor industry expertise may lead to higher audit quality while market power may lead to higher or lower audit quality depending on the issuer client's demand for audit quality.

We also include inspection year and issuer industry fixed effects to control for potential unobserved factors that affect a specific inspection year or industry (e.g., litigation risk).[19] Estimated coefficient p-values are calculated based on standard errors clustered by audit firm.

Table 2 summarizes the results of three alternative model specifications. Model (1) includes only inspection year fixed effects and therefore corresponds most closely to the comparison of means analysis presented in **Table 1**. Model (1) indicates that the marginal effect of satisfactory remediation is −23.9 percentage points.[20] Model (2) includes several issuer- and firm-level control variables potentially related to the probability of having at least one Part I.A deficiency. The marginal effect of satisfactory remediation changes from −23.9 percentage points to −26.4, suggesting that the control variables explain part of the impact of satisfactory remediation suggested by model (1) and the comparison of means analysis.[21]

Even though model (2) controls for several issuer- and firm-level characteristics, it may not completely control for pre-existing differences between firms that satisfactorily remediated and firms that did not. In other words, a portion of the −26.4 percentage point satisfactory remediation effect identified by model (2) may have been present prior to the remediation effort and therefore not attributable to the remedial actions. Model (3) attempts to control for this potential bias by including as an additional control variable each firm's Part I.A deficiency rate from its prior inspection.[22] The estimated coefficient is positive and highly statistically significant, reducing the marginal effect from −26.4 percentage points to −20.4. This result suggests that, prior to their remediation efforts, firms that satisfactorily remediated already had a lower propensity to have at least one Part I.A deficiency than firms that did not satisfactorily remediate but that this gap subsequently widens after their remediation efforts.

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[19] **Appendix B. Data Definitions** provides definitions for all variables used in our models. Several PCAOB and academic studies (PCAOB (2018), Aobdia (2019a), Aobdia et al. (2021), and Gipper (2019)) perform econometric analyses of Part I.A deficiencies among annual firms and include a broader set of control variables (e.g., sales growth and the standard deviation of sales growth). We concluded that these control variables would not be appropriate to include in our study because it would result in an unacceptable reduction of our sample that is limited to triennial firms.

[20] The marginal effect is the change to the predicted probability of having at least one subsequent Part I.A deficiency attributable to the satisfactory remediation outcome assuming that all control variables are at their means. The marginal effects and their corresponding p-values are given in the grey rows of **Table 2**.

[21] In untabulated analyses, we consider alternative definitions of some control variables. Specifically, we redefine issuer size as the natural log of the market capitalization, leverage ratio as debt-to-equity ratio, and market share of the auditor as the market share of the audit office (instead of the firm). The results regarding the effect of satisfactory remediation remain similar.

[22] We calculate prior Part I.A deficiency rate by dividing the number of reviewed issuer audits from the firm's prior inspection which had at least one Part I.A deficiency by the number of reviewed issuer audits from the firm's prior inspection.

Table 2 Regression Models for Probability of Subsequent Part I.A Deficiency

	(1)	(2)	(3)
Satisfactory Remediation	−1.096***	−1.232***	−0.955***
	(0.000)	(0.000)	(0.001)
Marginal Effect	−0.239***	−0.264***	−0.204***
	0.000	0.000	0.001
Previous Part I.A Rate			1.041***
			(0.000)
Log Total Assets		0.055	0.044
		(0.211)	(0.318)
Leverage Ratio		0.393	0.385
		(0.120)	(0.132)
CFO Scaled by Total Assets		−0.032	0.079
		(0.939)	(0.854)
Loss Indicator		0.136	0.162
		(0.423)	(0.334)
December Year-End Indicator		−0.313*	−0.299*
		(0.053)	(0.060)
Multinational Corporation Indicator		0.579***	0.595***
		(0.002)	(0.001)
Restructuring Indicator		−0.533**	−0.486**
		(0.012)	(0.024)
New Client Indicator		0.141	0.082
		(0.660)	(0.801)
Auditor Tenure		−0.050	−0.058
		(0.674)	(0.621)
Firm Market Share		−1.014*	−1.135**
		(0.061)	(0.034)
Intercept	−1.272**	−1.243*	−2.022***
	(0.023)	(0.059)	(0.002)
Inspection Year FE	Yes	Yes	Yes
Issuer Industry FE	No	Yes	Yes
Observations	1,166	1,166	1,166
Firm Clusters	Yes	Yes	Yes
Pseudo R^2	0.047	0.080	0.096
Specification	Logit	Logit	Logit

*Note: p-values are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.*

The estimated coefficients for the remaining control variables provide additional noteworthy insights on the underlying drivers of Part I.A deficiencies in our sample. The estimated coefficient for *Log Total Assets* is positive and marginally insignificant. This suggests that there may be some loss of issuer client independence associated with the size of the issuer client that may be offset by additional compensatory auditor effort. The estimated coefficient for *Leverage* is positive and marginally insignificant in models (2) and (3). This may suggest that highly leveraged issuers may be more difficult to audit or that shareholders accept less audit quality because they have an active lender monitor.[23] The estimated coefficient for *CFO Scaled by Total Assets* is insignificant. This suggests that the presence of lender monitoring does not play a significant role in shareholder demand for audit quality. The estimated coefficient for *Loss Indicator* is also insignificant. This suggests that issuers reporting a loss do not present significant additional auditing

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[23] We note that previous econometric models of Part I.A deficiencies show mixed results for *Leverage*, likely driven by differences in sample. For example, PCAOB (2018) finds a significant negative effect for U.S. triennial NAF firms but an insignificant effect for U.S. Big 8 firms. Aobdia (2019a) and Aobdia (2021) find a positive and significant effect. Gipper (2021) finds an insignificant effect.

challenges. The estimated coefficient for *December Year-End Indicator* is negative and significant. This runs counter to theoretical predictions yet is consistent with several other academic and PCAOB studies.[24] Unobserved issuer-level information may be driving an omitted variable bias. For example, issuers with non-standard fiscal years may be riskier and more difficult to audit. The estimated coefficient for *Multinational Corporation Indicator* is positive and highly significant. This is consistent with theoretical predictions that multinational issuers are more difficult to audit as described in academic literature.[25] By contrast, running counter to theoretical predictions, the estimated coefficient for *Restructuring Indicator* is negative and highly significant. Unobserved issuer-level information may be driving an omitted variable bias.[26] The estimated coefficients for both *New Client Indicator* and *Audit Tenure* are statistically insignificant. This suggests that the length of the relationship between issuer and auditor either does not play a significant role for the firms in our sample or that the countervailing effects of client-specific expertise and potential compromises to auditor independence are offsetting. Finally, the estimated coefficient for *Firm Market Share* is negative and statistically significant. This suggests that industry-specific expertise may improve audit quality.[27]

Table 3 summarizes our DiD model of Part I.A deficiencies, an alternative approach for identifying the impact of satisfactory remediation. It shows Part I.A deficiency rates for four different sets of reviewed audits: (1) audits reviewed by satisfactorily remediating firms subsequently to their remediation effort, (2) audits reviewed by satisfactorily remediating firms prior to their remediation effort, (3) audits reviewed by non-satisfactorily remediating firms subsequently to their remediation effort, and (4) audits reviewed by non-satisfactorily remediating firms prior to their remediation effort.[28]

Consistent with the comparison of means analysis, **Table 3** indicates that, among audits reviewed subsequently to their remediation efforts, satisfactorily remediating firms have a 31.5 percentage point lower Part I.A deficiency rate than non-satisfactorily remediating firms. As we discussed above, this suggests that satisfactory remediation may reduce the prevalence of Part I.A deficiencies; however, part of the difference could be driven by pre-existing differences between satisfactorily remediating and non-satisfactorily remediating firms that are not associated with the satisfactory remediation effort. For example, satisfactorily remediating firms may have already had stronger QC systems in place. Confirming this intuition and consistent with our econometric models, **Table 3** indicates that satisfactorily remediating firms already had a 24.9 percentage point lower Part I.A deficiency rate prior to their

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[24] Aobdia (2019a) finds that *December Year-End* is negatively but insignificantly associated with Part I.A deficiencies and negatively and significantly associated with firms' internal inspection ratings among all PCAOB-registered firms. Aobdia et al. (2021) find that *December Year-End* is consistently negatively associated with Part I.A deficiencies among U.S. Big 8 firms. Certain of their models indicate marginal significance while others indicate marginal insignificance. PCAOB (2018) finds that *December Year-End* is negatively and significantly associated with Part I.A deficiencies among U.S. Big 8 firms and negatively and insignificantly associated with Part I.A deficiencies among U.S. triennial NAFs.

[25] *See*, e.g., Sutherland and Trompeter (2017).

[26] Related prior literature generally finds an insignificant effect. PCAOB (2018) finds a negative but statistically insignificant *Restructuring Indicator* effect for U.S. triennial NAF firms and a positive and insignificant effect among U.S. Big 8 firms.

[27] Five of the control variables (*Log Total Assets*, *Loss Indicator*, *CFO Scaled by Total Assets*, *New Client Indicator,* and *Audit Tenure*) are statistically insignificant. The presence of insignificant control variables is not unusual in empirical audit quality research (*see*, e.g., Aobdia (2019a) at Table 5). A Wald test, a standard measure of the statistical significance of a set of control variables, indicates that these control variables are also jointly statistically insignificant. As a sensitivity test, we ran a restricted model that drops the five insignificant control variables. We find that the results regarding the effect of satisfactory remediation remain similar. We note that the R^2 values are consistent with other Part I.A regression models in the academic literature.

[28] The Part I.A deficiency rates presented in **Table 3** are calculated as in **Table 1** except (1) the rates appearing in the "Prior" column use the prior reviewed audits rather than the subsequently reviewed audits, and (2) the rates appearing in the "Non-satisfactory" row combine all of the non-satisfactory outcomes. **Table 3** does not account for the control variables from **Table 2**.

remediation efforts, before the satisfactory remediation effort could have had an impact. The statistically significant DiD effect, −6.6 percentage points, explicitly subtracts out the pre-existing difference and thus provides a potentially more accurate estimate of the impact of satisfactory remediation.[29]

Table 3 also indicates that satisfactorily remediating firms reduce their Part I.A deficiency rate by a statistically significant 9.1 percentage points subsequent to their satisfactory remediation efforts. This provides additional evidence that satisfactory remediation may reduce the prevalence of Part I.A deficiencies. However, this difference could be partly due to factors correlated with time that are unrelated to the satisfactory remediation effort. For example, other PCAOB policies, aside from its remediation program, may be driving secular trends in firms' compliance with auditing standards. Indeed, **Table 3** indicates that non-satisfactorily remediating firms reduced their Part I.A deficiency rate by a statistically insignificant 2.5 percentage points. The statistically significant DiD effect, 6.6 percentage points, helps control for this potential bias by explicitly subtracting out the improvement of non-satisfactorily remediating firms.[30]

Table 3 Difference-in-Differences Model for Part I.A Deficiencies

	Prior	Subsequent	Difference
Non-satisfactory	65.2	62.7	−2.5
			(−0.70)
Satisfactory	40.4	31.2	−9.1***
			(6.15)
Difference	−24.9***	−31.5***	−6.6*
	(−9.23)	(−11.18)	(−1.69)

*Note: t-statistics are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The units are percentage points. Errors are due to rounding.*

Restatements

Figure 2 compares the mean subsequent restatement rates of the firms' issuer clients across remediation outcomes.[31] Firms' issuer clients restated 6.1% of financial statements audited subsequently to remediation. However, the subsequent restatement rate varies significantly depending on the remediation outcome. For example, issuer clients of firms that satisfactorily remediated all their QC deficiencies have a lower restatement rate (5.5%) than those that had an unsatisfactory outcome (14.6%) or that only partially remediated (8.0%).

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[29] −6.6 = −31.5 − −24.9

[30] −6.6 = −9.1 − −2.5

[31] We calculate the subsequent restatement rate by dividing the number of subsequently reviewed issuer audits for which the issuer subsequently materially restated their financial statements by the number of subsequently reviewed issuer audits. We calculate subsequent restatement rates by remediation outcome category by limiting the numerators and denominators to the reviewed audits performed subsequently to each remediation outcome separately. We exclude from our calculations subsequently reviewed audits of foreign private issuers, benefit plans, funds, and referred work engagements because, in these cases, data on restatements are either not readily accessible or a less useful proxy for financial reporting quality.

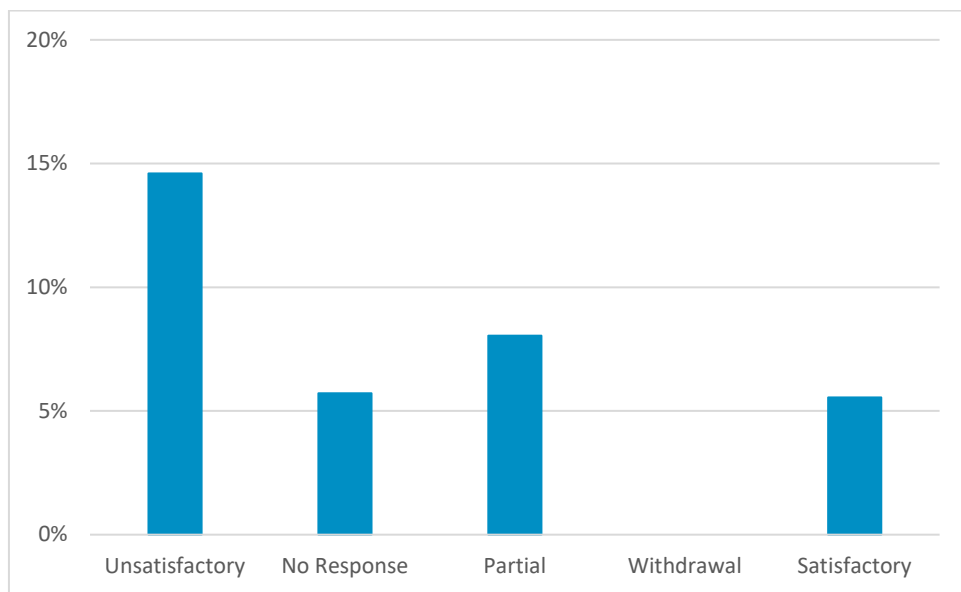Figure 2 Mean Subsequent Restatement Rates by Remediation Outcome

Figure 2 Mean Subsequent Restatement Rates by Remediation Outcome

Table 4 compares the mean subsequent restatement rates of issuer clients for each of the remediation outcomes (t-statistics reported in parentheses). The results suggest that issuer clients of firms that satisfactorily remediated have a significantly lower subsequent restatement rate than issuer clients of firms that unsatisfactorily remediated or partially satisfactorily remediated. The mean restatement rates for the unsatisfactory and partial remediation outcomes are insignificantly different from one another. As we did for the Part I.A analysis, we group all the remediation outcomes besides the satisfactory remediation outcome into a single non-satisfactory remediation outcome group. In untabulated analysis, we find that the mean subsequent restatement rate for firms that did not satisfactorily remediate is 8.8%, a statistically significant 3.3 percentage point difference vis-à-vis firms that did satisfactorily remediate.

Table 4 Difference in Mean Subsequent Restatement Rates for Each Prior Remediation Outcome

	No Response	Partial	Withdrawal	Satisfactory
Unsatisfactory	−8.9*	−6.6	−14.6***	−9.1***
	(−1.81)	(−1.59)	(−3.88)	(−2.38)
No Response		2.3	−5.7**	−0.2
		(0.65)	(−2.04)	(−0.06)
Partial			−8.1***	−2.5**
			(−4.77)	(−1.4)
Withdrawal				5.5***
				(10.49)

Note: Differences are equal to the restatement rates for the column remediation outcomes minus the restatement rates for the row remediation outcomes. The units are percentage points. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. t-statistics are in parentheses.

As we did in our Part I.A deficiency analysis, we estimate three alternative regression models and perform a DiD analysis to help control for potential omitted variable bias. **Table 5** presents the results of the

regression analysis.[32] The results are similar to **Table 2**; however, a comparison of model (2) between the respective tables indicates that the estimated coefficients for *Leverage Ratio* and *Audit Tenure* have stronger statistical significance in the restatement models, while the estimated coefficients for *December Year-End Indicator*, *Multinational Corporation, Restructuring,* and *Firm Market Share* become statistically insignificant. **Table 6** summarizes our DiD analysis of firms' issuer clients' restatement rates.[33] The results are similar to **Table 3**. However, unlike **Table 3**, **Table 6** indicates that (1) the reduction in the restatement rate for issuer clients of satisfactorily remediating firms (−0.6 percentage points) is statistically insignificant; and (2) the DiD effect (−0.5 percentage points) is statistically insignificant.

Differences between the Part I.A analysis and the restatement analysis are likely driven by inherent differences between compliance with professional standards and restatements. While compliance with professional standards and restatements are both proxies for audit quality, they capture different information.[34] In particular, restatements are a function of overall financial reporting quality, which is a joint product of the issuer and the auditor. As such, the differences we observe in statistical significance could reflect differences between the drivers of restatements and the drivers of compliance with professional standards. For example, the fact that the estimated coefficient for *Audit Tenure* becomes statistically significant in the restatement model could indicate that the auditor's familiarity with the issuer does improve overall financial reporting quality even though it does not improve the auditor's compliance with professional standards. By contrast, the fact that the estimated coefficient for *Firm Market Share* becomes statistically insignificant in the restatement model could indicate that the auditor's industry expertise does not improve overall financial reporting quality even though it does improve the auditor's compliance with professional standards.

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[32] We exclude from our econometric analysis subsequently reviewed audits of foreign private issuers, benefit plans, funds, and referred work engagements because, in these cases, data on restatements are either not readily accessible or a less useful proxy for financial reporting quality. We also limit our sample to subsequently reviewed audits for which we can obtain corresponding control variables from Compustat and Audit Analytics.

[33] The restatement rates presented in **Table 6** are calculated as in **Table 4** except (1) the rates appearing in the "Prior" column use the prior reviewed audits rather than the subsequently reviewed audits, and (2) rates appearing in the "Non-satisfactory" row combine all of the non-satisfactory outcomes. **Table 6** does not account for the control variables from **Table 5**.

[34] *See*, e.g., Aobdia (2019a) who finds that, though Part I.A deficiencies and restatements are significantly correlated, their correlation coefficient is relatively small (0.07), and each measure has different correlations to other audit quality measures.

Table 5. Regression Models for Probability of Subsequent Restatement

	(1)	(2)	(3)
Satisfactory Remediation	−1.549***	−1.610***	−1.384***
	(0.000)	(0.000)	(0.002)
Marginal Effect	−0.064***	−0.049***	−0.041***
	0.000	0.001	0.004
Previous Part I.A Rate			0.901**
			(0.039)
Log Total Assets		−0.032	−0.039
		(0.811)	(0.773)
Leverage Ratio		1.804***	1.844***
		(0.000)	(0.000)
CFO Scaled by Total Assets		0.814	0.994
		(0.439)	(0.355)
Loss Indicator		0.140	0.173
		(0.719)	(0.659)
December Year-End Indicator		0.252	0.273
		(0.552)	(0.527)
Multinational Corporation Indicator		−0.216	−0.216
		(0.561)	(0.570)
Restructuring Indicator		−0.559	−0.490
		(0.325)	(0.396)
New Client Indicator		−1.328*	−1.332*
		(0.058)	(0.057)
Auditor Tenure		−0.704**	−0.667**
		(0.035)	(0.044)
Firm Market Share		−2.819	−2.887
		(0.209)	(0.211)
Intercept	−1.235*	−0.291	−1.046
	(0.062)	(0.822)	(0.422)
Inspection Year FE	767	767	767
Issuer Industry FE	Yes	Yes	Yes
Observations	0.066	0.145	0.153
Firm Clusters	Yes	Yes	Yes
Pseudo R^2	0.020	0.145	0.153
Specification	Logit	Logit	Logit

Note: p-values are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 6 Difference-in-Differences Model for Restatements

	Prior	Subsequent	Difference
Non-satisfactory	8.6	8.5	−0.1
			(−0.08)
Satisfactory	5.9	5.3	−0.6
			(−0.77)
Difference	−2.8**	−3.2***	−0.5
	(−2.06)	(−2.71)	(−0.24)

Note: t-statistics are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The units are percentage points. Errors are due to rounding.

V. CONCLUSION

Our analysis of the impact of satisfactory remediation of Part II QC deficiencies on subsequent compliance with professional standards and financial reporting quality provides new data-driven insights on the impact of satisfactory remediation of Part II QC deficiencies.

First, we performed an analysis of subsequent Part I.A deficiencies. Overall, we found that satisfactory remediation is consistently significantly negatively associated with subsequent Part I.A deficiencies. Our comparison of means analysis found that firms that satisfactorily remediated have a statistically significant 31.5 percentage point lower subsequent Part I.A deficiency rate than firms that did not satisfactorily remediate. To help control for the possibility that other factors besides the satisfactory remediation effort could be driving this difference, we performed an econometric analysis and a DiD analysis. Our econometric analysis found that satisfactory remediation outcomes are associated with between 20.4 and 26.4 percentage point (all statistically significant) lower probability of having at least one subsequent Part I.A deficiency. Our DiD analysis found that satisfactory remediation is associated with between a 6.6 and 9.1 percentage point (both statistically significant) lower subsequent Part I.A deficiency rate.

Second, we performed an analysis of subsequent restatements. Consistent with prior academic studies, we found that satisfactory remediation is associated with a decrease in the subsequent restatement rate; however, several of our statistical effects are insignificant. Our comparison of means analysis found that issuers audited by firms that satisfactorily remediated have a statistically significant 3.3 percentage point lower subsequent restatement rate than the issuers audited by firms that did not satisfactorily remediate. As with the Part I.A analysis, to help control for the possibility that other factors besides the satisfactory remediation effort could be driving this difference, we performed an econometric analysis and a DiD analysis. Our econometric analysis found that satisfactory remediation outcomes are associated with between 4.1 and 6.4 percentage points lower probability of issuer restatements. All three econometric estimates are statistically significant. Our DiD model indicates that satisfactory remediation outcomes are associated with between 0.5 and 0.6 percentage points (both statistically insignificant) lower probability of subsequent issuer restatement.

Several factors limit our ability to make stronger conclusions. First, our data sample is smaller than other empirical studies of audit quality due to our deliberate research design, which focuses on reviewed audits performed by triennial firms that had a QC deficiency in a prior inspection report. While this research design choice allows us to better focus on the impact of remediation, it also reduces the statistical significance of our estimates. This is especially true for the restatement analysis because restatements occur much less frequently than Part I.A deficiencies. Second, our econometric analyses compare satisfactorily remediating firms to non-satisfactorily remediating firms while controlling for a set of firm- and issuer-level factors. It is possible that, even after controlling for these factors, the association between satisfactory remediation and subsequent Part I.A deficiency or restatement may be partially driven by differences between satisfactorily remediating firms and non-satisfactorily remediating firms that existed prior to remediation or are otherwise unrelated to the remedial actions themselves. Our analysis attempts to address this concern by: (1) including as an additional control variable firms' prior inspection Part I.A deficiency rate; (2) estimating an alternative model specification that considers the subsequent remediation outcome rather than the prior; and (3) performing a DiD analysis that explicitly subtracts out the prior inspections' Part I.A deficiency rate (or issuer client restatement rate).

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APPENDIX A. ACADEMIC RESEARCH RELATED TO REMEDIATION OF DEFICIENCIES IN QC SYSTEMS

Buslepp and Victoravich (2014) compare the audit quality of issuers audited by triennial firms that satisfactorily remediate their QC deficiencies ("*Remediate* firms") to the audit quality of issuers audited by triennial firms that did not satisfactorily remediate their QC deficiencies ("*QCC* firms"). The authors identify *Remediate* firms as those whose public inspection report indicates that a non-public portion exists, but which is never subsequently made public. By contrast, the authors identify *QCC* firms as those whose Part II of their inspection report is made public. After controlling for several auditor and issuer characteristics, including the presence of Part I.A deficiencies in Part I of the PCAOB inspection report, the authors find that "[d]uring the remediation period, triennial *QCC* firms are more likely to issue an audit opinion for financial statements that will later be restated relative to triennial *Remediate* firms."[35] The authors conclude that "the results are consistent with the theory that triennial *QCC* firms conduct lower quality audits during the remediation period."[36]

Aobdia (2018) finds that, among the eight largest audit firms, the issuers of reviewed audit engagements that received a Part I.A deficiency and were cited in an unremediated audit performance QC deficiency have a much higher propensity to restate two years after the initial inspection.[37] He concludes that the result is consistent with remediation driving improvement in financial reporting quality. In closely related research, Aobdia (2019b) finds that, also among the eight largest audit firms,[38] the proportion of firms' Part II of the inspection report by word count which is not satisfactorily remediated is positively associated with the likelihood of their issuer clients' restatement of audited financial statements having fiscal year ends after the release date of the inspection report and prior to the release data of the subsequent inspection report. The author posits that word count is a proxy for the severity of QC issues because (1) more numerous QC deficiencies tend to be associated with a longer Part II; (2) more severe QC deficiencies tend to be associated with a longer Part II; and (3) PCAOB report language is generally stable across firms and time. Among all other firms besides the eight largest audit firms, Aobdia (2019b) finds that the presence of any unremediated QC deficiencies is also positively associated with the likelihood of issuer clients' restatement. The author concludes that the evidence is consistent with successful remediation of QC deficiencies positively influencing audit quality.

Carlisle et al. (2020) study the association between remediation of triennial firms' QC deficiencies and audit quality. The authors use a similar method as Buslepp and Victoravich (2014) to identify *Remediate* firms and *QCC* firms. Using issuer clients' restatements as their proxy for audit quality, the authors find that: (1) *Remediate* firms reduced the likelihood that their issuer clients subsequently restate; (2) *Remediate* firms reduced the likelihood that their issuer clients subsequently restate significantly more than *QCC* firms; (3) the issuer clients of *QCC* firms and the issuer clients of *Remediate* firms do not have a significantly different likelihood of restatement during the year prior to inspection; and (4) the issuer clients of *QCC* firms are significantly more likely to restate than the issuer clients of *Remediate* firms

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[35] *See* Buslepp and Victoravich (2014) at 21.

[36] *See* Buslepp and Victoravich (2014) at 22.

[37] The author does not identify the individual audit firms. The author defines "audit performance QC deficiency" as a QC deficiency for which "PCAOB inspectors identify similar issues across several inspected engagements." The author had access to non-public PCAOB information while employed as a Senior Economic Research Fellow at the PCAOB.

[38] The author identifies the eight largest firms as: Deloitte & Touche LLP, Ernst & Young LLP, KPMG LLP, PricewaterhouseCoopers LLP, Grant Thornton LLP, BDO US LLP, Crowe Horwath LLP (now Crowe LLP), and McGladrey LLP (now RSM LLP).

during the year following the inspection. The authors conclude that remediation of QC deficiencies improves audit quality.

Drake et al. (2016) study the financial reporting impact of Deloitte's actions to remediate QC deficiencies related to its auditing of income tax accounts after the PCAOB published Part II of the firm's 2007 inspection report. The authors were able to determine that Deloitte subsequently addressed these deficiencies because Part II of the firm's 2008 inspection report subsequently published by the PCAOB did not include these deficiencies. The authors find an increase in reported valuation allowances and an increase in the reserve for uncertain tax positions among Deloitte's clients and suggest that this was due to Deloitte's changes to quality controls related to the income tax accounts.

Dee et al. (2011) study the stock market reaction to the PCAOB's public 2007 Order Instituting Disciplinary Proceedings, Making Findings, and Imposing Sanctions ("Order")[39] regarding Deloitte's 2003 audit of Ligand Pharmaceuticals Incorporated. The Order disclosed information related to Deloitte's failure to comply with certain PCAOB auditing standards, Deloitte's problems with its QC policies and procedures, and changes Deloitte represented making to its QC policies and procedures related to the performance and deployment of audit partners and directors to address these problems. The authors find that Deloitte's publicly traded clients experienced negative stock market effects following the publication of the PCAOB's disciplinary actions against Deloitte described in the Order. They conclude that the stock market reaction was primarily due to the public disclosure of Deloitte's QC system problems and Deloitte's representation of their attempts to address those problems because Deloitte's clients had no reaction to other events related to the Ligand audit failure that predated the PCAOB's sanctions.

Nagy (2014) reports that audit firms lose market share after the public release of unremediated QC deficiencies and that the effect is driven primarily by unremediated audit performance QC deficiencies.[40] Extending Nagy (2014), Buslepp et al. (2018) find that the negative audit market reaction to public unremediated QC deficiencies occurs during the year prior to their public release. The authors suggest that audit clients anticipate the public release of unremediated QC deficiencies based either on information contained in the public Part I.A of the inspection report or through inquiries by the audit committee. They find that firms with unremediated QC deficiencies related to audit performance[41] lose market share during the year after the release of Part I.A of the inspection report and firms with unremediated QC deficiencies related to firm management[42] lose market share during the year after the remediation period has ended.

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[39] PCAOB Release No. 105-2007-005.

[40] The author manually categorized public QC deficiencies. The author's audit performance category includes QC deficiencies related to: technical competency, due care, and professional skepticism; concurring partner review; auditor communications; appropriate procedures; engagement completion document; fraud procedures; testing appropriate to the audit; partner workload; audit documentation; consultation; audit policies, procedures, methodologies, including training; communications with predecessor auditors; competency of engagement team; financial statement disclosures; personnel management; related party transactions; review of interim financial information; and subsequent discovery of facts existing at date of the audit report.

[41] The authors define QC deficiencies related to audit performance as: "Quality control issues related to audit performance criticisms are determined based on 'the audit deficiencies disclosed in Part I.A and other audit deficiencies that, while not as significant, may indicate serious defects in the firm's quality control system' (PCAOB, 2012)."

[42] The authors define QC deficiencies related to firm management as: "Firm management criticisms result from the inspection staff's review of the firm's management structure and processes including: the tone at the top, partner management practices (evaluation, compensation, admission and disciplinary practices), client acceptance and retention decisions and compliance with rules (PCAOB, 2012)."

APPENDIX B. DATA DEFINITIONS

The table below defines the dependent and independent variables used in the econometric analyses. Remediation outcomes and Part I.A deficiencies data are obtained from proprietary PCAOB sources. Restatements and all other independent variables were obtained from Compustat and Audit Analytics.

Variable	Definition
Dependent Variables	
Part I.A Deficiencies	An indicator variable equal to one if the reviewed issuer audit had Part I.A deficiencies.
Restatement	An indicator variable equal to one if the issuer filed an 8-K Item 4.02 with respect to the audited issuer's financial statement.
Independent Variables	
Previous Part I.A Rate	The Part I.A deficiency rate from the firm's prior inspection.
Log Total Assets	The natural logarithm of total assets.
Leverage Ratio	Total debt divided by the sum of total debt and equity.
CFO Scaled by Total Assets	The cash flow from operations divided by beginning period total assets.
Loss Indicator	An indicator variable equal to one if the net income before extraordinary items is negative.
December Year-End Indicator	An indicator variable equal to one if the issuer audit has a December fiscal year-end date.
Multinational Corporation Indicator	An indicator variable equal to one if the foreign income taxes are non-zero.
Restructuring Indicator	An indicator variable equal to one if the restructuring cost is not zero.
New Client Indicator	An indicator variable equal to one if the current issuer audit is a first-time engagement with the auditor.
Audit Tenure	The natural logarithm of the length of the issuer-audit firm relationship in years.
Firm Market Share	Audit fees divided by total audit fees across all firms in an industry.
Inspection Year	Inspection year of the inspection performed.
Issuer Industry	Issuer's industry based on the Fama-French 12 industry classifications, available from Ken French's website.

APPENDIX C. SENSITIVITY TESTS

Our choice to focus on triennial firms raises potential questions about the sensitivity of our main results to our inclusion of global network firm ("GNF") affiliates.[43] GNF affiliates may have substantially more resources available for quality control and therefore may remediate their QC systems more effectively than triennial NAFs. However, the QC systems of triennial GNFs tend to be more developed and therefore may have less room for improvement. To address the possibility that there are systematic differences in the impact of satisfactory remediation between the two groups, we repeated our analysis using only the NAFs in our sample. The results are presented in **Table 7**, **Table 8**, **Table 9**, and **Table 10**. The results are similar to our main results. For example, the DiD effect for the Part I.A deficiency rate decreases from −6.6 percentage points with a t-statistic of −1.69 to −5.5 percentage points with a t-statistic of −1.37. This suggests that the triennially inspected GNFs are not driving our main results.

Our sample includes some reviewed audits that firms performed prior to the completion of their remediation period. This may give rise to a downward bias in our estimates as these audits may have been performed before the firm was able to remediate their QC deficiencies. To address this concern, we repeated our analysis while limiting attention to firm inspections that began at least one year after the end of the prior remediation period. This restriction ensures that all of the subsequently reviewed audits were performed after the remediation period.[44] The results are presented in **Table 11**, **Table 12**, **Table 13**, and **Table 14**. The results are similar to the main analysis. For example, the DiD effect for the Part I.A deficiency rate increases from −6.6 percentage points with a t-statistic of −1.69 to −12.2 percentage points with a t-statistic of −1.60. However, several of the marginal effects for our restatement model become statistically insignificant, likely due to the significantly reduced sample size.

Our sample was limited to reviewed audits only. For a potentially more complete picture of the overall financial reporting quality impact of satisfactory remediation, we obtained from Audit Analytics all the 10-K and 10-KSB audit opinions signed by the inspected firms in our sample for which the fiscal year end of the audited financial statements fell during the year leading up to the firm inspection start date. The results are presented in **Table 15** and **Table 16**. The results are similar to the main analysis. For example, the DiD effect remains small and statistically insignificant. However, the differences between satisfactory firms and non-satisfactory firms are smaller and no longer statistically significant for both the prior and subsequent periods. Since the selection of audits for review has historically been risk-based, this suggests that the impact of satisfactory remediation is more pronounced for the riskiest issuer audits.

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[43] A GNF is a firm that is a member of BDO International Limited, Deloitte Touche Tohmatsu Limited, Ernst & Young Global Limited, Grant Thornton International Limited, KPMG International Cooperative, or PricewaterhouseCoopers International Limited. A NAF firm is a firm that is not affiliated with a GNF firm.

[44] We do not use this restricted sample in our main analysis for several reasons. First, firms typically begin implementing remedial actions as soon as they receive comment forms from the inspection staff. This implies that any potential downward bias in the main results would be minimal. Second, the restricted sample is significantly smaller, particularly for the restatement models. Third, this restriction may introduce a new bias to our estimates. Firms with significantly delayed inspection reports or that are inspected sooner than three years following their prior inspection tend to have the poorest audit quality and therefore may respond to remediation differently than firms with higher audit quality.

Table 7 Regression Models for Probability of Subsequent Part I.A Deficiency (NAF Only)

	(1)	(2)	(3)
Satisfactory Remediation	−1.035***	−1.200***	−0.951***
	(0.001)	(0.001)	(0.007)
Marginal Effect	−0.227***	−0.258***	−0.204**
	0.001	0.001	0.006
Previous Part I.A Rate			1.081***
			(0.000)
Inspection Year FE	Yes	Yes	Yes
Issuer Industry FE	No	Yes	Yes
Control Variables	No	Yes	Yes
Observations	698	698	698
Firm Clusters	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R^2	0.090	0.143	0.158
Specification	Logit	Logit	Logit

Note: p-value are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 8 Difference-in-Differences Model for Part I.A Deficiency Rates (NAF Only)

	Pre	Post	Difference
Non-satisfactory	65.0	62.3	−2.7
			(−0.72)
Satisfactory	39.3	31.1	−8.2***
			(4.92)
Difference	−25.7***	−31.3***	−5.5
	(−9.23)	(−10.66)	(−1.37)

Note: t-statistics are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The units are percentage points. Errors are due to rounding.

Table 9 Regression Models for Probability of Subsequent Restatement (NAF Only)

	(1)	(2)	(3)
Satisfactory Remediation	−1.422***	−1.535***	−1.236***
	(0.000)	(0.000)	(0.008)
Marginal Effect	−0.066***	−0.056***	−0.043**
	0.000	0.001	0.013
Previous Part I.A Rate			1.155**
			(0.025)
Inspection Year FE	Yes	Yes	Yes
Issuer Industry FE	No	Yes	Yes
Control Variables	No	Yes	Yes
Observations	661	661	661
Firm Clusters	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R^2	0.062	0.130	0.143
Specification	Logit	Logit	Logit

*Note: p-value are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.*

Table 10 Difference-in-Differences Model for Restatement Rates (NAF Only)

	Prior	Subsequent	Difference
Non-satisfactory	8.7	8.6	−0.1
			(−0.05)
Satisfactory	6.4	5.9	−0.5
			(−0.55)
Difference	−2.3*	−2.7*	−0.4
	(−1.67)	(−1.85)	(−0.19)

*Note: t-statistics are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The units are percentage points. Errors are due to rounding.*

Table 11 Regression Models for Probability of Subsequent Part I.A Deficiency (Inspections At Least One Year After Remediation)

	(1)	(2)	(3)
Satisfactory Remediation	−1.005**	−1.549**	−1.354*
	(0.033)	(0.014)	(0.064)
Marginal Effect	−0.217**	−0.313**	−0.266*
	0.030	0.013	0.060
Previous Part I.A Rate			1.793***
			(0.001)
Inspection Year FE	Yes	Yes	Yes
Issuer Industry FE	No	Yes	Yes
Control Variables	No	Yes	Yes
Observations	347	347	347
Firm Clusters	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R^2	0.050	0.166	0.200
Specification	Logit	Logit	Logit

Note: p-values are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table 12 Difference-in-Differences Model for Part I.A Deficiency Rates (Inspections At Least One Year After Remediation)

	Prior	Subsequent	Difference
Non-satisfactory	49.6	57.3	7.7
			(1.07)
Satisfactory	29.4	25.0	−4.4*
			(1.89)
Difference	−20.1***	−32.3***	−12.2
	(−3.89)	(−5.76)	(−1.60)

Note: t-statistics are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The units are percentage points. Errors are due to rounding.

Table 13 Regression Models for Probability of Subsequent Restatement (Inspections At Least One Year After Remediation)

	(1)	(2)	(3)
Satisfactory Remediation	−0.870	−4.081***	−4.267***
	(0.181)	(0.005)	(0.005)
Marginal Effect	−0.065	−0.029	−0.027
	0.179	0.226	0.218
Previous Part I.A Rate			0.964
			(0.571)
Inspection Year FE	Yes	Yes	Yes
Issuer Industry FE	No	Yes	Yes
Control Variables	No	Yes	Yes
Observations	122	122	122
Firm Clusters	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R^2	0.068	0.382	0.386
Specification	Logit	Logit	Logit

*Note: p-values are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.*

Table 14 Difference-in-Differences Model for Restatement Rates (Inspections At Least One Year After Remediation)

	Prior	Subsequent	Difference
Non-satisfactory	7.8	11.4	3.6
			(1.07)
Satisfactory	3.2	5.0	1.8
			(1.40)
Difference	−4.6**	−6.4***	−1.9
	(−1.88)	(−2.43)	(−0.52)

*Note: t-statistics are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The units are percentage points. Errors are due to rounding.*

Table 15 Regression Models for Probability of Subsequent Restatement (Expanded Sample)

	(1)	(2)	(3)
Satisfactory Remediation	−1.396***	−1.333***	−1.159***
	(0.001)	(0.001)	(0.004)
Marginal Effect	−0.050***	−0.037***	−0.032***
	0.001	0.001	0.004
Previous Part I.A Rate			0.788**
			(0.047)
Inspection Year FE	Yes	Yes	Yes
Issuer Industry FE	No	Yes	Yes
Control Variables	No	Yes	Yes
Observations	1,942	1,942	1,942
Firm Clusters	Yes	Yes	Yes
Constant	Yes	Yes	Yes
Pseudo R^2	0.046	0.108	0.113
Specification	Logit	Logit	Logit

*Note: p-values are in parentheses; *** p<0.01, ** p<0.05, * p<0.1.*

Table 16 Difference-in-Differences Model for Restatement Rates (Expanded Sample)

	Prior	Subsequent	Difference
Non-satisfactory	5.2	4.1	−1.1
			(1.52)
Satisfactory	4.9	3.6	1.3***
			(3.86)
Difference	−0.3	−0.5	−0.2
	(−0.60)	(−0.96)	(−0.26)

*Note: t-statistics are in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. The units are percentage points. Errors are due to rounding.*